RECLAMATION INVESTIGATION REPORT

Black Pine Mine

Prepared for

Montana Department of Environmental Quality

May 2012 Final

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Prepared for

Montana Department of Environmental Quality
Abandoned Mine Lands Bureau
1100 North Last Chance Gulch
P.O. Box 200901
Helena, MT 59620-0901

Prepared by

Herrera Environmental Consultants
101 East Broadway, Suite 610
Missoula, MT 59802
Telephone: 406.721.4204

In Association With

Trihydro Corporation
2707 Broadwater Avenue
Helena, MT 59601
Telephone: 406.588.4180

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Acronyms and Abbreviations

A	area
AALS	acute aquatic life standard
ABA	acid base accounting
ACM	asbestos-containing material
AOC	Area of Concern
AHERA	Asbestos Hazard Emergency Response Act
ARARs	applicable or relevant and appropriate requirements
ASA	American Society of Agronomy
ASARCO	American Smelting and Refining Company
AST	aboveground storage tank
ASTM	American Society for Testing and Materials
ATV	all-terrain vehicle
bgs	below ground surface
BPM	Black Pine Mine
BW	body weight
CALEPA	California Environmental Protection Agency
CEC	cation exchange capacity
CFC	chlorofluorocarbons
cfs	cubic feet per second
CLP	contract laboratory program
cm/s	centimeters per second
COC	contaminant of concern
COPC	contaminant of potential concern
cy	cubic yard
DEQ/AMLB	Montana Department of Environmental Quality/Abandoned Mine Lands Bureau
DQO	data quality objective
EEE/CA	expanded engineering evaluation and cost analysis
ELCR	Estimated Lifetime Cancer Risk
EPA	U.S. Environmental Protection Agency
EPC	exposure point concentration
EQ	ecological impact quotient
FSP	Field Sampling Plan
ft	foot or feet
GI ABS %	Gastrointestinal Absorption percentage
GPS	global positioning system
HBM	Hazardous Building Materials
HEAST	Health Effects Assessment Summary Tables
HHS	human health standards
HID	high-intensity discharge
HMI	hazardous materials inventory
HQ	Hazard Quotient
HR	home range
HUC	Hydrologic Unit Code

Acronyms and Abbreviations (continued)

in	inch
IR	ingestion rate
IRIS	integrated risk information system
kg	kilogram
kg/day	kilogram per day
LAP	laboratory analytical plan
lb	pound
LCS	laboratory control standard
L/d	liters per day
MBMG	Montana Bureau of Mines and Geology
MCL	maximum contaminant level
meq/100 g	milliequivalents per 100 grams
MF	modifying factor
µg/L	micrograms per liter
mg/m^3	milligrams per cubic meter
mg/kg	milligrams per kilogram
mg/L	milligrams per liter
mm	millimeters
mmhos/cm	millimhos per centimeter
MS	matrix spike
MT	Montana
NCP	National Contingency Plan
NOAA	National Oceanographic and Atmospheric Administration
NOAEL	no observed adverse effects level
NRAD	North Removal Area drainage
oz	ounce
PCB	polychlorinated biphenyl
pcf	pounds per cubic foot
PCM	point count method
ppm	parts per million
PPRTV	Provisional Peer Reviewed Toxicity Values
PRG	preliminary reclamation goal
QA	quality assurance
QC	quality control
RA	risk assessment
RAGS	Risk Assessment Guidance for Superfund
RBCG	risk-based cleanup guidelines
RCRA	Resource Conservation and Recovery Act
RfC	reference concentration
RfD	reference dose
RI	reclamation investigation
RPD	relative percent difference
RSL	regional screening levels

Acronyms and Abbreviations (continued)

RWP	Reclamation Work Plan
SCR	soil consumption rate
SF	slope factor
SRAD	South Removal Area drainage
s.u.	standard units
TAL	target analyte level
TCLP	Toxicity Characteristic Leaching Procedure
TDS	total dissolved solids
TRL	target reporting level
TRV	toxic reference values
TSCA	Toxic Substance Control Act
TSI	thermal system insulation
UCL	upper confidence limit
UF	uncertainty factor
USCS	Unified Soil Classification System
USDA	U.S. Department of Agriculture
USFS	United States Forest Service
USGS	United States Geological Survey
WIR	water ingestion rate
XRF	x-ray fluorescence

Executive Summary

The Black Pine Mine (BPM) is located approximately 12 miles from Philipsburg, Montana in Granite County. The site consists of approximately 1,055 acres of patented mining claims and 157 unpatented lode claims on lands administered by the United States Forest Service (USFS). Mining began at the BPM around 1885 and continued, intermittently, into the 1990s. The mine site encompasses several historic and modern mining areas, including the Combination Mine Area of Concern (AOC), the Tim Smith Mine AOC, the Historic Mine AOC, and the Combination Mill AOC. Physical and environmental hazards resulting from mining operations remain at the site. In addition to remnant structures, adits, and shafts, areas of metals-impacted wastes are located throughout the site. Metals-impacted wastes include mine tailings and waste rock, as well as sediments and soils impacted by metals leaching from mine wastes or from metals-laden seeps. These impacted materials create risks for both site users and ecological receptors.

Investigations and environmental monitoring began at the BPM in 1981 and have continued through this Reclamation Investigation (RI). Based on historical sampling results, reclamation activities were previously undertaken in the Combination Mill AOC and Combination Mine AOC. Reclamation activities in these areas consisted of partial reclamation of the Combination Mill tailings impoundment in the mid-1990s, installation of the Combination Mine seepage collection and pumpback system in 2001, and excavation of impacted soils from the Combination Mine Soils Removal Areas. These impacted soils were combined with the Combination Mine waste rock pile and grading and capping of the Combination Mine waste rock pile occurred between 2004 and 2006. While these reclamation activities consolidated large portions of the mining-impacted wastes at the BMP, exposure pathways for these materials to human and ecological receptors remain, as do other areas of impacted materials. This RI was undertaken by the Montana Department of Environmental Quality, Abandoned Mine Lands Bureau (DEQ/AMLB) to delineate the nature and extent of impacted wastes and physical hazards at the BPM, and to estimate the risks these hazards pose to human health and the environment. This RI did not investigate the impacts of the seepage collection system and pumpback system on the mine pool or the interactions between the mine pool and seeps at the Combination Mine. However, transducers were installed in groundwater wells and flow meters were installed on the pumpback lines to provide data for future investigation of the surface water/groundwater interaction at the Combination Mine. This RI report was prepared to document activities performed and results of the RI, including RI sampling performed at the site, analyses of RI sampling data and comparisons of this data with historical data, delineation of the nature and extent of wastes at the BPM, and data pertinent to potential reclamation activities.

Sampling

Field sampling activities focused on collecting data to support human health and ecological risk assessments, to fill in data gaps from previous sampling efforts, and to support analysis of reclamation alternatives for the BPM. RI sampling was performed at the BPM over five field

events between May 5 and August 18, 2011. Sampling activities were scheduled to optimize conditions for sampling each media type (e.g., seep samples were collected during snowmelt, surface water and sediment samples were collected during runoff, and soils were sampled after the runoff had subsided). A total of 283 samples were collected, including samples of soil, sediments, tailings, waste rock, building materials, surface water, and groundwater. Samples were analyzed for field and laboratory parameters, metals, geotechnical properties, asbestos, agricultural properties, and acid base accounting (ABA).

Sampling Results and Analyses

Combination Mine AOC

Elevated metals concentrations at the Combination Mine AOC appear to be limited to waste rock in the Combination Mine waste rock pile, and one isolated area near the lower extent of the South Soils Removal Area. Metals concentrations in the samples collected from surface soils on the waste rock pile and in the Soils Removal Area, as well as soils underlying the waste rock samples were approximately one to two orders of magnitude less than concentrations detected in the waste rock samples.

At least one detected metal concentration exceeded either DEQ RBCG or Circular DEQ-7 standards in each of the surface water/seep samples collected from seeps at the Combination Mine AOC. The highest metals concentrations were reported in samples collected from CPS-1, CPS-7A, CPS-10B, and DTRD. Review of historical data indicates that metals concentrations have declined substantially since removal of impacted soils, grading and capping of the waste rock and impacted soils, and installation of the seepage collection pumpback system between 2001 and 2006.

Similar to surface/seep samples, at least one detected metal concentration exceeded Circular DEQ-7 standards in each of the groundwater samples collected at the Combination Mine AOC. Metals concentrations in six of the nine groundwater samples collected exceeded three or more Circular DEQ-7 standards. Metals concentrations in samples collected during the RI do not vary notably from historical groundwater metals concentrations.

Asbestos was not detected in samples of suspect building materials collected from the Combination Mine AOC.

Tim Smith Mine AOC

Detected metals concentrations exceeded DEQ RBCG in waste rock samples collected at the Tim Smith Mine AOC, with the highest metals concentrations detected in samples collected from the Tim Smith No. 1 Adit waste rock dump. Metals concentrations were notably higher in the two waste rock samples collected from the Tim Smith No. 1 Adit waste rock dump as compared to metals concentrations in the one waste rock sample collected from the Tim Smith No. 2 Adit waste rock dump. Metals concentrations detected in RI waste rock samples were similar to concentrations detected in 2001 waste rock samples collected from the Tim Smith No. 1 Adit waste rock dump. Detected metals concentrations were substantially lower in soil samples

collected below the waste rock and in the surface soil samples, as compared with waste rock samples. Metals concentrations detected in downslope sediment samples were approximately an order of magnitude lower than detected concentrations in waste rock samples.

Metals concentrations did not vary significantly from upstream to downstream surface water sample locations. In addition, metals concentrations in surface water samples collected at the Tim Smith Mine AOC were significantly (one to two orders of magnitude) lower than concentrations in surface water/seep samples collected at the Combination Mine AOC. Detected metals concentrations in RI surface water samples appear to be consistent with historical surface water metals concentrations with the exception of iron. Iron concentrations were substantially higher in RI surface water samples than in historical samples, although this increase may be attributed to the difference in analysis methods (total recoverable versus dissolved metals).

Asbestos was not detected in samples of suspect building materials collected from the Tim Smith Mine AOC.

Historic Mine AOC

Elevated metals concentrations were detected in solid media samples collected at the Historic Mine AOC with the highest concentrations detected in waste rock samples collected from test pits excavated along the downslope edge of the Harper Shaft waste rock area. Metals impacts appear to be limited to the visually apparent waste rock areas. The lowest metals concentrations were detected in the subsurface soil samples excavated along the upslope edge of the Harrison Shaft waste rock area, and the surface soil samples collected along the northern fringe of the Harrison Shaft waste rock area. One sediment sample was collected from Mill Creek; metals concentrations detected in the sediment sample were similar to concentrations detected in the soil samples.

Two surface water samples were collected at the Historic Mine AOC. One sample location coincided with the routine surface water monitoring location, MCSP-1, on Mill Creek. The second sample location, Road Cut, was identified in the field during the sampling event and collects surface runoff from the Tim Smith No. 2 Adit waste rock dump and from portions of the Lewis Shaft area. Detected metals concentrations exceeded DEQ RBCG for arsenic and zinc in the surface water sample collected from MCSP-1 and for arsenic in the surface water sample from Road Cut. With the exception of antimony, cadmium, and silver, metals concentrations were significantly higher in the sample collected at MCSP-1 during the RI as compared to metals concentrations in historical surface water samples from this location.

Asbestos (60% Chrysotile) was detected in a sample of grout collected from collapsed Harrison Shaft rubble in the Historic Mine AOC. Asbestos was not detected in other samples of suspect building materials collected from the Historic Mine AOC.

Combination Mill AOC

Solid media samples collected at the Combination Mill AOC consisted of tailings, soils, and sediments. Average antimony, arsenic, cadmium, copper, iron, lead, and zinc concentrations

were higher in the tailings samples than in soil or sediment samples. Average concentrations of metals in sediment samples collected along South Fork Lower Willow Creek downstream of the tailings impoundment were higher than average concentrations for subsurface soil samples collected from the tailings impoundment test pits or in the sediment grid samples collected west of the tailings impoundment. Detected metals concentrations from tailings samples did not exhibit trends based on the sample depth. Likewise, detected metals concentrations were not significantly different in the tailings samples from concentrations detected in the underlying soil samples. Metals concentrations in sediment samples decreased moving downstream from the Combination Mill and tailings impoundment, but were dependent on the location of individual samples. Five sediment sample locations were identified in the field to target suspected tailings depositional areas downstream of the tailings impoundment along South Fork Lower Willow Creek. Samples collected at three of these five locations contained the highest metals concentrations of the sediment samples collected during the RI. Elevated metals concentrations were similar across RI and historical sampling events.

Review of surface water sample results from the Combination Mill AOC indicate total recoverable metals concentrations and metals loading rates generally increase from upstream to downstream. The largest increase in both metals concentrations and metals loading rates begin at the Combination Mill and continue to increase sharply at sample stations downstream of the Combination Mill on USFS-administered lands. Surface water flowing through the Combination Mill tailings impoundment and fluvially deposited tailings in the downstream floodplain likely are responsible for increased metals concentrations and loading rates in South Fork Lower Willow Creek.

Asbestos was not detected in samples of suspect building materials collected from the Combination Mill AOC.

Samples of wood and bricks from the Combination Mill and “Old Mill” were submitted for total recoverable metals analysis of RCRA metals. Detected concentrations of arsenic (two out of four samples), lead (four samples), and mercury (two out of four samples) exceeded 20 times the toxicity characteristic limit, indicating these materials could be hazardous. Based on these results, samples of wood and bricks at the Combination Mill AOC should be collected and submitted for Toxicity Characteristic Leaching Procedure (TCLP) analysis.

Waste Volumes

Approximately 400,000 cubic yards (cy) of metals-impacted wastes are estimated to be present at, and downgradient of the BPM. These impacted wastes, summarized in the table below, include waste rock, tailings, and metals-impacted soils and sediments. The estimated waste volumes are based on review of analytical results, test pit observations, review of boring logs, and interpretation of topographic mapping. The largest volumes of wastes are those that have been consolidated in the Combination Mine waste rock pile and the Combination Mill tailings impoundments.

Estimated Impacted Waste Volumes at Black Pine Mine

Impacted Waste Location	Estimated Volume (cy)[1]
Combination Mine Waste Rock Pile	230,000
Combination Mine Soils Removal Areas	5,000
Tim Smith Waste Rock Dumps at Tim Smith No. 1 and No. 2 Adits	22,650
Combination Mill Sediments, Soils, and Tailings Impoundments	107,900
South Fork Lower Willow Creek Stream Sediments	18,000
Historic Mine Area Waste Rock Areas	13,350
Total	396,900

cy – cubic yards
[1]Quantities are preliminary; estimates and will be refined based on further evaluation and design.

Risk Assessments

Human health and ecological risk assessments were performed to identify contaminants of concern (COCs) at the BPM based on sample results from each AOC. The human health risk assessment identified COCs present in solid media as antimony, arsenic, and lead, while COCs present in surface water were identified as antimony, arsenic, lead, and mercury. Arsenic and lead were also identified as carcinogen COCs for recreational users.

The ecological risk assessment identified multiple COCs that affect the health of the ecosystem. COCs present in the surface water and sediments in South Fork Lower Willow Creek that pose a significant risk to the health of aquatic life include arsenic, cadmium, copper, lead, mercury, silver, and zinc. The COCs for terrestrial wildlife present at the BPM include antimony, arsenic, and lead. COCs for terrestrial plant communities include arsenic, cadmium, copper, lead, mercury, and zinc.

Preliminary Repository Investigation

A preliminary repository investigation was completed as part of the RI to determine if suitable locations existed onsite for the construction of a repository to contain the solid media wastes identified during the RI. Four repository locations were investigated:

- Repository 1 – approximately 12 acres located along the west side of the ridge above the Combination Mine waste rock pile and west of Black Pine Road.

- Repository 2 – approximately 15 acres located in a topographic bowl north of the access road to the Lewis Shaft and includes the Harrison and Harper shaft areas.

- Repository 3 – approximately nine acres located along the south face of the ridge separating the Lewis Shaft from the Tim Smith No. 1 Adit, and west of the road from the Lewis Shaft to the Tim Smith No. 1 Adit.

- Combination Mill Repository – approximately eight acres located west of South Fork Lower Willow Creek in the area of the Combination Mill.

Based on results from preliminary investigations during the RI, the proposed Repository 2 area appears to be a better alternative as compared with the other proposed repository areas for long-term waste storage. While weathered bedrock is shallow in this area, a portion of the repository area could be over-excavated. Based on fluid level monitoring to date, there also appears to be separation from groundwater, although the separation will need to be confirmed during seasonal high groundwater levels during the spring snowmelt.

Future Activities

Due to the levels of these toxic substances at the BPM, reclamation to reduce human health and ecological risks is recommended. Reclamation should focus on removing antimony, arsenic, and lead from human exposure pathways associated with soil, tailings, waste rock, and sediments, as well as removing antimony, arsenic, lead, and mercury from exposure pathways associated with surface waters. Tailings located along South Fork Lower Willow Creek banks and within the floodplain that may be transported during high flow events should be excavated and disposed of to improve ecological conditions. Additional geotechnical investigations are also recommended to determine whether an onsite repository could be constructed to contain impacted soils, sediments, tailings, and waste rock. Reclamation alternatives will be further identified and examined as part of the EEE/CA process.

1.0 Reclamation Investigation

This Reclamation Investigation (RI) report describes environmental conditions found at the Black Pine Mine (BPM). As requested by the Montana Department of Environmental Quality, Abandoned Mine Lands Bureau (DEQ/AMLB), under DEQ Contract No. 407032, Task Order Nos. 9 and 10, Herrera Environmental Consultants (Herrera), in conjunction with Trihydro Corporation (Trihydro), prepared a Reclamation Work Plan (RWP), collected field and laboratory data, and prepared this RI report for the BPM. The RI report includes delineations of the nature and extent of wastes at the site, estimates of risks that these wastes may pose to human health and the environment, and data pertinent to potential reclamation.

1.1 Introduction

The BPM consists of approximately 1,055 acres of patented mining claims and 157 unpatented lode claims on lands administered by the United States Forest Service (USFS). The BPM is accessible by traveling south on Highway 1 (MT-1) approximately 24 miles from Exit 153 on Interstate 90, then traveling west and north via the Black Pine Road (County Road 178) approximately 8.5 miles. The site is located in Sections 7, 8, 9, 16, 17, 18, 20, and 21 in Township 8 North, Range 14 West, in Granite County, Montana (Figure 1-1). The mine site encompasses several historic and modern mining areas, including the Combination Mine Area, the Tim Smith Mine Area, the Historic Mine Area, and the Combination Mill Area (Figure 1-2 and Figure 1-3). Site elevations range from approximately 5,600 feet above mean sea level at the historic Combination Mill area to approximately 6,500 feet near the modern day Combination Mine.

The BPM is comprised of a variety of mining impacted lands including tailings, tailings impoundments, waste rock piles, mine adits and shafts, and fluvially deposited mine tailings and mill deposits. Based on previous reports, four potentially contaminated media (surface water, soil [including tailings and waste rock], sediment, and groundwater) are present at the BPM. Elevated levels of antimony, arsenic, cadmium, copper, iron, lead, mercury, and manganese were found in tailings and waste rock samples. Surface water and groundwater samples showed elevated levels of antimony, arsenic, cadmium, copper, iron, lead, manganese, mercury, and zinc. Sediment samples showed elevated levels of antimony, arsenic, cadmium, lead, and mercury.

1.2 Environmental Setting

1.2.1 Climate

Climate information was obtained from measurements at the Black Pine Snotel (#349) (NWCC 2011). Average monthly temperatures range from a high of 66oF to a low of 42oF in July and a high of 39oF to a low of 3oF in January. Average annual precipitation is 24 inches, with May and June being the wettest months of the year. Precipitation is mostly in the form of snow during the winter months, snow and rain during the spring and fall, and rain during the summer.

1.2.2 Geology and Soils

The geology near the BPM consists of folded and faulted Precambrian sedimentary rocks that have been intruded by Cretaceous batholiths. The area is underlain by sedimentary rocks of Beltian age, including extensive areas of Newland and Spokane formations that are steeply tilted and faulted (DEQ 2009). Sedimentary rocks have been metamorphosed from contact with the intrusive igneous rocks. Diopside, epidote, and magnetite were formed in impure Newland limestone.

At the BPM, the Spokane Formation (the oldest of the Precambrian units), consists of thin-bedded siltstone, sandstone and shale, and massive quartzite (Wollenberg et al. 1980). The rocks at the mine strike N 10˚ to 30˚ W and dip from 10˚ to 30˚ SW.

Ores are found only in the sedimentary formations, including fissure veins in quartzite and replacement veins along fissures in limestone and calcareous shales (DEQ 2009). Four mineral veins have been identified in the BPM: the Upper, Tim Smith, Combination, and Onyx. The Combination vein has been the primary focus of mining at the site, which contains elevated silver concentrations (DEQ 2009). This vein is a fissure filling located along a single bedding plane that has been displaced by normal faulting (Hydrometrics 2010).

1.2.3 Hydrogeology

Monitoring wells were previously installed in the Combination Mine Area of the BPM to evaluate groundwater – surface water interactions evidenced by seeps noted below the toe of the Combination Mine waste rock pile. Four monitoring wells were installed in and downslope of the Combination Mine waste rock pile in 2001. One well (CMMW-2) was installed along the crest of the waste rock pile, a second well (CMMW-1) was installed at the toe of the waste rock pile, and two other wells (CMMW-3 and CMMW-4) were installed downgradient in the North Soils Removal Area. In 2007, shallow piezometers were installed at three locations (CMPZ-3S, CMPZ-3D, and CMPZ-4) near CMMW-3 and CMMW-4; only CMPZ-4 yielded sufficient water for sampling in May 2007. Additional monitoring wells were installed in 2008 to evaluate flow through the Combination Mine waste rock pile and to monitor downgradient groundwater quality. Two wells (CMMW-5 and CMMW-6) were installed in the crest of the waste rock pile and three wells (CMMW-7, CMMW-8, and CMMW-9) were installed along the toe of the waste rock pile. Review of historic groundwater sample results indicates elevated metals concentrations in groundwater in and downgradient from the Combination Mine waste rock pile (Hydrometrics 2010).

1.2.4 Hydrology

Drainage along the western, southern, and northern portions of the BPM, including the Combination Mill, Tim Smith Mine, and Historic Mine Areas, flows to the South Fork Lower Willow Creek, which is part of the Flint-Rock Basin (hydrologic unit code [HUC] 17010202). Drainage from these areas includes the ephemeral Mill Creek and the Tim Smith drainages.

Tailings from the Combination Mill area have been transported and deposited throughout the downstream reaches of South Fork Lower Willow Creek (MCS 2004). A large magnitude flood in 1989, which followed a forest fire in the upper reaches of the watershed, mobilized a large volume of tailings from the Combination Mill site that were fluvially deposited in floodplain areas and behind several beaver dams located along South Fork Lower Willow Creek (MCS 2004).

Drainage along the eastern portion of the BPM, which includes the Combination Mine Area, flows to Smart Creek, which also is part of the Flint-Rock Basin. Several seeps emanate from or downslope of the Combination Mine waste rock pile. Efforts to reduce and/or control metals-bearing seeps and runoff were undertaken beginning in 2001 with the construction of a seepage collection and pumpback system. The seepage collection and pumpback system consists of a series of French drains that drain to a wet vault downgradient of the waste rock pile. The pumpback system pumps the collected surface water into the Combination Mine auxiliary adit. The Combination Mine waste rock pile was regraded and capped between 2004 and 2006. Surface soils from the Combination Mine Soils Removal Areas were excavated and incorporated with the waste rock as part of the waste rock regrading and capping. Review of sample and analytical results since installation of these measures indicates a reduction in seep metals concentrations, although elevated concentrations, as compared to background conditions, still exist in both the downslope soils and water collected from seeps (Hydrometrics, 2010).

Installation of the seepage collection/pumpback system appears to be influencing the mine pool elevation. The water level in the mine pool has increased since installation of the seepage collection/pumpback system. Prior to the installation of the system, the Combination Mine pool was measured at approximately 6,000 feet. The mine pool was measured at a high in July of 2011 at approximately 6,100 feet or a 100 foot increase over the 10 years since the system was installed. The increase in the Combination Mine pool may be affecting the quantity and chemistry of the downgradient seeps. This connection will be investigated further during future investigations.

1.2.5 Vegetation and Wildlife

The BPM is characterized by native and introduced vegetation species. These include plants growing on undisturbed areas around the site, while little or no vegetation is growing on tailings and waste rock piles, or the Combination Mine Soils Removal Areas downslope form the Combination Mine. Dominant trees include lodge pole pine (*Pinus contorta*), Engelmann spruce (*Picea engelmannii*), Douglas fir (*Pseudotsuga menziesii*), and Ponderosa pine (*Pinus ponderosa*) (MCS 2004). Shrubs and other vegetative species include grouse whortleberry (*Vaccinium scoparium*), snowberry (*Symphoricarpos alba*), and blue huckleberry (*Vaccinium globurlare*) (MNHP 2010).

The habitat supports a variety of large mammals (deer, elk, moose, black bear, bobcat, potentially lynx, and beaver), small mammals (rabbit, squirrel, mouse, and vole), and birds (owls, eagles, and raptors) (MNHP 2010).

1.2.6 Land Use and Population

The BPM is located on private land surrounded by the Beaverhead-Deerlodge National Forest. The primary land use is the vicinity of the site is recreational. The population in Granite County is 3,079 people, with an average of 1.8 persons per square mile (USCB 2010).

1.3 Land Ownership

The current owner of the BPM is the Montana Environmental Trust Group, LLC (Trust). The site was previously owned by the American Smelting and Refining Company (ASARCO). The surrounding land is administered by the USFS.

2.0 Investigation Objectives and Activities

The RWP was developed to outline and describe proposed reclamation investigation work, support development of this RI report, and included a Field Sampling Plan (FSP) detailing the sampling objectives of the RI field work. Field sampling activities focused on collecting data to support human health and ecological risk assessments and to fill in data gaps from previous sampling efforts. Information collected to support the risk assessments included the following:

- Magnitude and extent of soil, sediment, waste rock, and tailings contamination
- Levels of total recoverable metals in surface water
- Levels of dissolved metals in groundwater
- Concentration of metals in background soils

The following activities were also undertaken to support analysis of reclamation alternatives for the BPM:

- Estimating the areas and volume of waste material to be reclaimed
- Identifying asbestos materials, if any, and performing an onsite materials inventory
- Identifying reclamation requirements for disturbed areas associated with lime and fertilizer application, including measuring soil texture, grain size, and organic matter, and documenting native plant species
- Identifying and characterizing potential repository sites
- Identifying potential borrow material in potential repository areas

Work at the BPM will include assessing site conditions, evaluating possible reclamation actions, designing a preferred alternative, overseeing construction, and monitoring reclamation effectiveness over time. Reclamation at the BPM will address both physical safety hazards and chemical exposure/contamination concerns. Addressing physical hazards will entail evaluating and designing means to stabilize, as appropriate, aboveground structures, and to close shafts and adit entrances. Developing appropriate reclamation alternatives to address chemical exposure concerns necessitates characterizing mine drainage and seeps, groundwater and surface water quality, and tailings, sediments, and waste rock contamination at the site. Reclamation alternatives will address contamination by removing or treating wastes from exposure pathways to minimize impacts to both humans and ecological receptors.

2.1 Summary of Field Activities

Field sampling activities at the BPM were performed over five field events between May 5, 2011 and August 18, 2011. Sampling activities were scheduled to optimize conditions for sampling each media type (e.g., seep samples were collected during snowmelt, surface water and sediment samples were collected during runoff, and soils were sampled after the runoff had subsided). The five field events included:

1. May 5th – collected groundwater samples from monitoring wells at the Combination Mine Area

2. May 19th – collected seep samples in the Combination Mine Area and the Tim Smith Mine Area

3. June 13th through June 16th – collected surface water samples and co-located sediment samples in the Tim Smith, Mill Creek, and South Fork Lower Willow Creek drainages

4. July 11th through July 15th – excavated test pits; collected soil, waste rock, sediment, and tailings samples; and inventoried site infrastructure

5. August 15th through August 18th – installed and collected samples from soils borings, which were completed as monitoring wells, and performed an asbestos investigation and materials inventory

The following sections summarize the sampling performed based on sample media and designated mine areas. Due to the large size of the site, the BPM was divided into four areas of concern (AOCs) (Figure 1-3):

1. Combination Mine Area – Approximately 162 acres located along the eastern edge of the site upstream of Smart Creek; includes the Combination Mine, adits, mine facilities, waste rock pile, soil borrow area, seepage collection/pumpback system, and Combination Mine Soils Removal Areas.

2. Tim Smith Mine Area – Approximately 432 acres located in the central and southern portions of the site upstream of South Fork Lower Willow Creek; includes the Tim Smith No. 1 Adit and waste rock dump, the Tim Smith No. 2 Adit and waste rock dump, and related mine facilities.

3. Historic Mine Area – Approximately 242 acres located along the northern edge of the site upstream of and along Mill Gulch; includes the Lewis Shaft, and the historic Harrison Shaft, Harper Shaft, Barret Shaft, Williams No. 3 Shaft, Williams No. 2 Shaft, Williams No. 1 Shaft, Combination No. 1 Adit, Combination No. 2 Adit, and Buenaventura Adit.

4. Combination Mill Area – Approximately 217 acres located along the western edge of the site along South Fork Lower Willow Creek; includes the historic Combination Mill and tailings impoundment, "old mill" site, and impacted tailings and sediments downstream along South Fork Lower Willow Creek.

A total of 283 samples were collected, including analytical, quality assurance/quality control (QA/QC), and geotechnical samples of soil, sediments, tailings, waste rock, building materials, surface water, and groundwater. A summary of the samples collected during the RI is provided in Table 2-1. This table includes laboratory analyses and sampling rationale. The sample locations were either marked in the field prior to sampling, or surveyed following sampling with a hand-held global positioning system (GPS) unit. Sample locations also are shown on figures (Figures 2-1 through 2-11) by AOC. Repository investigation samples are discussed in Section 7, Repository Site Investigation.

2.1.1 Field Sampling Methods

Field samples were collected and processed in general accordance with the RWP, except as discussed in Section 2.3, Deviations from the RWP.

2.1.1.1 Surface Soil

Surface soils were sampled by first removing the top layer of soil or debris to the desired sample depth with a shovel. A thin layer of soil was removed from the area that came in contact with the shovel. Soil was collected using a pre-cleaned, stainless steel spoon and placed into a pre-cleaned stainless steel bowl and mixed thoroughly to obtain a homogenous sample representative of the sampling interval. Samples were placed into appropriately labeled containers and the caps secured tightly. Composite samples were collected by placing aliquots from multiple sampling locations into the pre-cleaned stainless steel bowl and mixing thoroughly. When compositing was complete, the sample was placed into labeled containers and the caps tightly secured.

2.1.1.2 Soil Borings

Three borings (MW-RY-06, MW-RY-07, and MW-RY-08) were advanced using a truck mounted auger drill rig equipped with 8.5-inch outside diameter hollow-stem auger. Each boring was logged continuously and discrete soil samples were collected using split-spoon samplers for soil classification and chemical analysis. Due to the large grain sizes (gravel, cobbles, and boulders) observed in the nearby test pits, two, 24-inch long samplers, one three inches and the second two inches in outside diameter, were used in succession for each four-foot interval to obtain continuous soil samples over the drilling depth. The samplers were driven using a 300-pound down hole hammer with a drop of 24 inches. The three-inch sampler was driven first. Then, the smaller two-inch outside diameter sampler was advanced in the same hole an additional two feet to complete the four-foot sample. As the split spoon samplers alternated between three-inches in diameter and two-inches in diameter and were advanced over a 24-inch interval rather than the standard 18-inch interval, the blow counts from these samples are not considered valid for estimating soil strength. This approach also compressed the soil samples obtained in each split spoon. Soils encountered during drilling were visually inspected by a

geologist for staining and classified in general accordance with the Unified Soil Classification System (USCS; American Society for Testing and Materials [ASTM] D2488-09a).

A fourth boring (MW-RY-09) was advanced using an air rotary drill rig with an air hammer drill bit. The air hammer drill bit had a diameter of 6-inches. As the air hammer advanced into the ground, cuttings were ejected from the borehole by the air pressure used to drive the air hammer. Samples of these cuttings were obtained with a stainless steel colander attached to a wooden stake approximately five feet long. The colander was set near the borehole to catch cuttings as they were ejected from the borehole by the air pressure. These cuttings are commonly called chips as the air hammer will break up gravel, cobbles, boulders, and bedrock as the hammer drills through the material. Chip samples were obtained at five-foot intervals. The field geologist/engineer logged the boring during drilling and from the chip samples.

2.1.1.3 Test Pits

Test pits were excavated with a class 320 Caterpillar excavator. The overall depth of test pits in known waste rock or tailings areas were determined in the field to delineate between mine waste and native soil. Test pits located in proposed repository sites were excavated to refusal in bedrock, or the maximum reach of the excavator, whichever was shallower. Samples were collected above and below the interface of material changes, such as where the soil horizon changed or at the waste rock/native soil interface. Test pit samples were collected and visually inspected in the field, locations and depths were documented in field notebooks and test pit logs. The sample material was classified using the USCS.

2.1.1.4 Sediment

Surface sediment was collected using a pre-cleaned, stainless steel spoon and placed into a pre-cleaned stainless steel bowl and mixed thoroughly to obtain a homogenous sample representative of the entire sampling interval (core tubes could not be used due to the abundance of gravel and rock in the streambed). For subsurface sediment samples collected outside the streambed, the top layer of sediment was removed to the desired sample depth with a shovel. A thin layer of sediment was removed from the area that came in contact with the shovel. Sediment was collected as described for surface sediment samples.

2.1.1.5 Groundwater

Groundwater was purged and collected using disposable bailers, 0.45 micron filters for dissolved metals, tubing and twine. A new set of disposable equipment was used for each well. The groundwater level in each well was gaged prior to sampling using the water level meter that is maintained onsite by DEQ. Gaging measurements were obtained from points indicated on the top of casing or from the north side of the casing, if no measuring point was marked. The static groundwater level and bottom of the well were measured and recorded on a field form for each well. Following well gaging, the volume of groundwater to be purged (three well casing volumes) was calculated and purged. Groundwater was hand bailed into a 5-gallon bucket to measure the approximate volume removed. In cases where three well casing volumes could not be purged due to slow recharge, the well was bailed dry and allowed to recharge before samples

were collected. Field parameter readings for pH, temperature, dissolved oxygen, and specific conductance were recorded for each casing volume of water removed. Observations about water quality conditions such as color, odor, and sediment were also recorded.

2.1.1.6 Surface Water

Surface water grab samples, including seep water samples, were collected by immersing the dedicated sample container directly into the surface water body, with the bottle located upstream of the field technician. At sample stations with collocated surface water and sediment samples, surface water samples were collected first to prevent contamination of the water column during sediment sampling. Field technicians donned a new pair of disposable gloves (i.e., clean, nontalc gloves made of nitrile, vinyl, or polyethylene) for each grab sample.

Field parameters readings for pH, conductivity, dissolved oxygen, and water temperature were measured using a Yellow Springs Instruments (YSI) 556 meter. The meter was calibrated each day prior to use.

2.1.1.7 Synoptic Sampling

Synoptic sampling was performed on South Fork Lower Willow Creek to characterize potential metals sources associated with the BMP. Synoptic sampling entailed collecting water samples at locations ordered from upstream to downstream. The time elapsed between sample collection at each station was determined by the mean travel time of the water flowing in the stream, such that the same pulse of water was sampled at each location as the water moved downstream through various contaminant source areas.

Discharge and surface water samples were collected at 13 locations on South Fork Lower Willow Creek and at the confluence site of three tributary streams to South Fork Lower Willow Creek (Figures 2-9 and 2-10). Surface water samples were also collected from two small ponds located within the reclaimed tailings impoundments at the Combination Mill AOC (Figure 2-7).

A representative reach of South Fork Lower Willow Creek with no major tributaries was selected to estimate the average travel time in the creek at the time of sampling. The top of the stream reach was located approximately 400 feet upstream of the Combination Mill. The stream reach was 200 feet in length and had a geomorphology that was representative of the study reach (i.e., similar frequency of pools and riffles). Based on calculations by Moore (Moore 2005), five pounds of table salt were dissolved in approximately 12 liters of creek water to produce an injection brine. One field technician was positioned at the top of the reach and another at the bottom. The technician at the top injected the brine slug and marked the time while the technician at the bottom of the reach placed a YSI 556 probe in the thalweg of the stream, recording conductivity concentrations at a five-second logging interval. The peak conductivity wave reached the logging meter five minutes after the brine was injected into South Fork Lower Will Creek, resulting in a travel time of 40 feet per minute. The travel time of 40 feet per minute was used to estimate the downstream pace at which synoptic samples were collected to allow a uniform pulse of water to be sampled.

Due to the time constraints associated with the measurement of discharge at 13 locations on South Fork Lower Willow Creek during elevated flows (spring freshet), the discharge at the synoptic sample stations was measured the day before (June 14, 2011) synoptic sampling. Flow conditions were relatively steady from June 13 to June 15, 2011 (no precipitation occurred on the two days prior to the sample event), so flow data collected at each station on June 14th were used in conjunction with grab sample data collected on June 15th to calculate pollutant mass loading. Flow data from the nearest United States Geological Survey (USGS) gage in the same watershed (Flint Creek at Maxville, USGS 12329500) is provided in Table 2-2. Inspection of these flow data shows the relatively steady flow conditions during the sampling event (USGS 2011).

Table 2-2. Flow Data for Flint Creek at Maxville Gaging Station

Date	Mean Gage Height (feet)
06/12/2011	4.15[P]
06/13/2011	4.09[P]
06/14/2011	4.00[P]
06/15/2011	3.97[P]

[P] Provisional data subject to revision

Two sample teams, each consisting of two field technicians, conducted the synoptic sampling. Using the estimated water travel time of 40 feet per minute, the team paced the timing of their sampling at each station progressing from upstream to downstream, beginning at CML-SW-05 and ending at CML-SW-01. After collecting a surface water sample, each sample team would leap-frog the other sample team as they collected the next synoptic surface water sample. This process was repeated until the last sample was collected. Each surface water sample was collected as described in Section 2.1.1.6.

2.1.1.8 Surface Water Discharge Measurements

Stream discharge rates were measured using the USGS-approved mid-section velocity method for measuring discharge in channels (USGS 1969). A Swoffer Model 2100-13 propeller velocity meter was used to measure water velocity and a ruler was used to record water depth.

At each station, field technicians extended a measuring tape perpendicular to the direction of flow and measured the width of the cross section. Measurements were recorded on a data sheet with the tape left strung across the stream. The stream width was then divided into at least 20 segments for water depth and velocity measurements. A minimum section width of 0.3 feet was selected, thus for smaller streams (e.g., Mill Creek) less than 20 segments were used. At each segment, the water depth was recorded and the velocity was measured at 60 percent of the full depth (measured from the surface).

The total discharge at each station was calculated as a summation of discharge measurements from each section using the following equations:

Equation 1: $$Q_t = \sum Q_n + Q_{n+1} + Q_{n+2} \ldots$$

Equation 2: $$Q_n = V_n \times d_n \left(\frac{b_{n+1} - b_{n-1}}{2} \right)$$

Where: b_{n-1} = distance from initial point to the preceding point (feet)

b_{n+1} = distance from the initial point to the following point (feet)

d_n = depth at location n (feet)

V_n = mean velocity at location n (feet/second)

Q_n = discharge through partial section n (cubic feet [ft^3]/sec).

Seep discharge rates were measured using the bucket and stopwatch method at a location immediately downstream of the water sampling location. One field technician placed a calibrated 5-gallon bucket in a location where all of the seep discharge entered the bucket while the other field technician operated the stopwatch. The bucket was held in the seep until nearly full and then was removed while the other field technician recorded the time elapsed to fill the bucket. The total volume in the calibrated bucket was recorded and divided by the time elapsed to determine the seep discharge rate. Two discharge measurements were recorded at each seep; the discharge rate was calculated as the average of the two measurements.

2.1.1.9 Hazardous Materials Inventory

A hazardous building materials (HBM) survey was performed to identify and document potential hazardous building materials onsite. The survey included asbestos and other potential HBM such as chlorofluorocarbons (CFC) in refrigerators, polychlorinated biphenyl (PCB) in light ballasts and transformers, and mercury containing fluorescent tubes and thermostats. This survey consisted of a visual inspection, photo documentation, and sample collection with analysis. As-built drawings for structures were not available.

Asbestos Hazard Emergency Response Act (AHERA) divides suspect asbestos-containing material (ACM) into three categories: “surfacing materials” (i.e., sprayed fireproofing, popcorn ceiling texture, etc.), “thermal system insulation” (TSI) (i.e., pipe or building insulation, etc.), and “miscellaneous materials” (i.e., flooring materials, roofing, construction mastics, etc.). Suspect materials in or on structures at the BPM were sampled for suspect ACM during this survey. The samples were analyzed for asbestos using the point count method (PCM) in accordance with EPA 600/M4-82-020 and EPA/600/R-93/116.

Older fluorescent light ballasts have small capacitors that may contain high concentrations of PCBs (the majority of ballasts manufactured before 1979 contain PCBs). All ballasts manufactured after July 1, 1978 that do not contain PCBs are required to be clearly marked "No PCBs". Unmarked ballasts or ballasts without a date code are assumed to contain PCBs. Fluorescent light fixtures were observed throughout many of the structures. These fixtures were not inspected for the presence of PCB light ballasts because determining the actual number of PCB containing light ballasts can best be verified during demolition. Typically, there is one ballast for every two light tubes in a fluorescent fixture. All ballasts located at the BPM are assumed to contain PCBs; all light tubes are assumed to contain mercury.

A general inventory of large equipment and other potentially hazardous materials present at the site was also performed for recycling and disposal purposes. A summary of items identified for recycling and/or disposal is presented in Section 3 for each AOC.

Materials that do not fall under Bevill exclusion from Subtitle C of the Resources Conservation and Recovery Act (RCRA) were also identified in the field at the Combination Mill AOC (Figure 2-11). Four samples of these materials were collected and submitted for laboratory analysis of RCRA metals. The results of the RCRA samples are provided in Section 3, Site and Waste Characterization as part of the discussions of sample results for the Combination Mill AOC.

2.2 Summary of Sampling by AOC

The following sections provide a synopsis of the samples collected and observations made during the field sampling effort. A summary of the samples is provided in Table 2-1; sample locations are shown on Figures 2-1 through 2-11. Only sample locations from the RI are included; historical sample locations are not shown or included in Table 2-1, except where they coincide with a RI sample location (e.g., CMMW-2, CPS-1, etc.). Sample identification numbers vary from the RWP, and deviations in sampling is further discussed in Section 2.3, Deviations from the RWP.

Sample results are discussed in Section 3, Site and Waste Characterization. Soil physical analysis and agricultural test results are presented in Section 4, Reclamation and Land Use Characterization Results, while geotechnical results, as well as analytical results for repository test pit samples, are presented in Section 7, Repository Site Investigation.

2.2.1 Combination Mine AOC

Sample locations at the Combination Mine AOC are shown on Figure 2-1 (Combination Mine) and Figure 2-2 (Smart Creek).

2.2.1.1 Summary of Solid-Matrix Sampling

Waste Rock

Three test pits were excavated within the Combination Mine waste rock pile to identify current conditions, provide additional data for waste characterization, and determine waste rock limits and volume. The test pits were located along the northern limits (CMN-RS-04/CMN-SS-04); the southern limits (CMN-RS-05/CMN-SS-05); and at the toe of the waste rock pile (CMN-RS-06/CMN-SS-06). These test pits were excavated to approximately one foot below the native soil/waste rock interface. Four waste rock samples were collected and analyzed for total recoverable metals, acid base accounting (ABA), and moisture content.

Soil

A total of 27 soils samples were collected from 16 sample locations at the Combination Mine AOC. Surface soil and native soil beneath the waste rock were collected from the three test pits within the Combination Mine waste rock pile. The three surface soil samples were analyzed for total recoverable metals, ABA, and moisture content while the three native soil samples were analyzed for total recoverable metals and moisture content.

Samples of potentially impacted surface soils were collected from eight test pit locations downgradient of the Combination Mine within and adjacent to the Combination Mine Soils Removal Areas to allow for comparison to historical data, expand analysis for additional metals of concern, and document current site conditions. Surface soil samples were collected from zero to one foot below ground surface (bgs) and analyzed for total recoverable metals, ABA, and moisture content. Two of the surface samples (CMN-SS-09 and CMN-SS-11) were also analyzed for geotechnical properties to determine engineering properties, such as maximum density and optimum moisture content, which will be used in designing the placement of impacted materials in a repository. Subsurface soil samples were collected at depths ranging from three to seven feet bgs (Table 2-1) and analyzed for total recoverable metals, moisture content, ABA, and agriculture analyses. Agricultural analysis and ABA were not performed for the subsurface soil samples collected from CMN-SS-10 and CMN-SS-14. These samples were collected in downgradient portions of the North Soils Removal Areas, below the Trust property boundary.

Two additional surface soil samples were collected on lands administered by USFS. One sample (CMN-SS-15) was collected in a roadside ditch just north of the Trust property boundary and the other sample (CMN-SS-16) was collected downgradient of a roadside culvert. These samples were analyzed for total recoverable metals and moisture content.

Three soil samples (CMN-SS-17 through CMN-SS-19) were collected inside the Combination Mine Central Processing building. Existing stockpiles of soil in the Central Processing building were sampled and analyzed for total recoverable metals and moisture content.

2.2.1.2 Summary of Water-Matrix Sampling

Surface Water

A total of 10 surface water samples, plus one field duplicate, were collected from seeps historically sampled to compare analytical results to historical data and to provide additional data to support the risk assessment (Figure 2-1 and Figure 2-2). Discharge rates were measured at each of the 10 locations using a calibrated 5-gallon bucket and stopwatch. Field parameters were recorded, and samples were analyzed for total recoverable metals, and laboratory parameters in accordance with the RWP.

Surface water and groundwater samples from the Combination Mine AOC, as well as the samples from locations TSP-10 (Tim Smith Mine AOC) and Road Cut (Historic Mine AOC) were collected under Task Order No. 9. The remaining surface water samples were collected under Task Order No. 10. The list of metals analyzed for surface water (total recoverable metals) and groundwater (dissolved metals) samples collected under Task Order No. 9 differed from the list of metals for surface water samples collected under Task Order No. 10. The different metals list for Task Order No. 9 was based on historical sample results at the Combination Mine AOC. Antimony, barium, chromium, mercury, and nickel were not included in the metals list for Task Order No. 9, but were included in the metals list for Task Order No. 10.

Groundwater

A total of nine groundwater samples, plus one field duplicate sample, were collected from the Combination Mine AOC to compare analytical results to historical data and provide additional data to support the risk assessments. Groundwater sample locations correspond to previously installed groundwater wells. Field parameters were recorded for each sample, and samples were analyzed for dissolved metals and laboratory parameters in accordance with the RWP.

Pumpback System

The Combination Mine seepage collection/pumpback system collects water from seeps within and downslope of the Combination Mine waste rock pile and pumps the water back into the Combination Mine auxiliary adit. The Combination Mine pool appears to be connected to some of the downstream seeps, most notably CPS-1. The increasing Combination Mine pool elevation, assumed to be a result of pumping collected seep water back into the mine workings, has been a concern for DEQ. However, the seepage collection/pumpback system did not include a means of calculating or monitoring the amount of water collected and pumped back into the mine workings. To allow for measurement and monitoring of the amount of water collected and pumped back into the mine workings, flow meters were installed in November 2011 as part of Task Order No. 10 on the pumpback piping upstream of the discharge into the Combination Mine auxiliary adit.

At the same time as the flow meters were installed, transducers were also installed in three wells at the Combination Mine AOC, CMMW-2, CMMW-4, and CMMW-8. An instrument to read barometric pressure and temperature was also installed to be used in conjunction with the transducers to compensate for changes in water level due to barometric fluctuations. An attempt

was also made to install a transducer in the Lewis Shaft. However, water was not detected in the shaft with a 500-foot long water level probe. Prior to the attempted installation, the mine pool elevation was estimated to be approximately 300 feet bgs based on the approximate Combination Mine pool elevation and the topographic data for the Lewis Shaft. A transducer was instead installed in the mine pool in the Combination Mine main adit to obtain mine pool elevation readings. The installation of the flow meters and transducer will assist in future investigations of the relationship between the mine pool, seepage collection/pumpback system, and the seeps. The investigation will occur following the removal of the waste rock pile.

2.2.1.3 Summary of Hazardous Materials Inventory

Suspect Asbestos-Containing Materials

A total of 30 samples (CMN-ASB-04 through CMN-ASB-33) were collected from 12 unique suspect building materials identified in three metal shop buildings located at the Combination Mine AOC (Figure 2-1). Suspect building materials included air cell insulation, two types of gypsum wallboard systems, white pipe sealant, poured concrete flooring, three types of ceiling tiles, sprayed on fireproofing, and three types of wallboard. Multiple, individual samples were collected from each of the 12 unique suspect building materials. A description of each sampled material and number of samples is presented in Appendix A.

Other Hazardous Building Materials

The three metal shop buildings at the Combination Mine AOC were inspected for cooling systems with potential CFCs, and for fluorescent and high-intensity discharge (HID) light fixtures. Materials identified during these inspections are discussed in Section 3.3.3.2.

2.2.2 Tim Smith Mine AOC

Sample locations at the Tim Smith Mine AOC are shown on Figure 2-3 and Figure 2-4.

2.2.2.1 Summary of Solid-Matrix Sampling

Waste Rock

Five test pits were excavated at the Tim Smith No. 1 Adit waste rock dump and Tim Smith No. 2 Adit waste rock dump to characterize the material, and to estimate the limits and volume of the waste rock dumps.

Three test pits were excavated and sampled in the Tim Smith No. 1 Adit waste rock dump; two test pits (TS-RS-01 and TS-SS-02) in the top and one test pit (TS-RS-03) along the toe of the waste rock dump. The test pits were excavated to approximately one foot below the native soil/waste rock interface. One composite waste rock sample was collected from two (TS-RS-01 and TS-RS-03) of the three test pits. Waste rock was not collected at location TS-SS-02 because the surface sample was visually identified in the field as native material pushed downgradient off the side slope to create a bench). The composite samples were analyzed for total recoverable metals, ABA, and moisture content. One of the composite waste rock samples (TS-RS-01) was analyzed for geotechnical properties to determine engineering properties, such as maximum

density and optimum moisture content, which will be used in designing the placement of impacted materials in a repository.

Two test pits were excavated and sampled in the Tim Smith No. 2 Adit waste rock dump. The test pits were excavated to approximately one foot below impacted soil/waste rock. One composite waste rock sample, on the top of the waste rock pile, was collected from test pit location TS-RS-07. No waste rock sample was collected from the test pit excavated in the side slope of the waste rock pile based on the lack of waste rock from the visual inspection performed by sampling personnel (TS-RS-08). The composite waste rock sample was analyzed for total recoverable metals, ABA, and moisture content.

Soil

One soil sample was collected from each test pit in both the Tim Smith No. 1 Adit and Tim Smith No. 2 Adit waste rock dumps for a total of five soil samples. The soil samples were collected at approximately 1 foot below the native soil/waste rock interface in each test pit. Soil samples TS-SS-02 (Tim Smith No. 1 Adit waste rock dump) and TS-SS-08 (Tim Smith No. 2 Adit waste rock dump) were collected approximately one foot below the interface of soil fill material along the slopes of the waste rock dumps and the underlying native soil. The soil samples were analyzed for total recoverable metals and moisture content.

Sediment

To determine recovery conditions, provide support for the risk assessment, and provide information for the Expanded Engineering Evaluation and Cost Analysis (EEE/CA), three sediment samples were collected from the Tim Smith Mine AOC. Two samples (TS-SD-01 and TS-SD-02) were collected from the Tim Smith drainage and one sample (TS-SD-03) from the confluence of the Tim Smith drainage and South Fork Lower Willow Creek. The TS-SD-03 sample was incorrectly labeled on the Chain of Custody from and in the laboratory reports as BP-CML-SD-03-00 (Lab ID 10160673003). The sample name has been corrected in the RI tables and in the database. Sediment sample locations correspond to historic surface water/seep sample locations TSP-3, TSP-6, and TSP-8. Samples were collected from zero to 0.5 foot bgs, and were analyzed for total recoverable metals and moisture content.

2.2.2.2 Summary of Water-Matrix Sampling

Surface Water

On May 19, 2011 (TSP-10 only) and June 13 and 14, 2011, a total of five surface water samples were collected from the Tim Smith Mine AOC to compare analytical results to historical data and to provide additional data to support the risk assessment. Three surface water samples were collected from the Tim Smith Drainage below the Tim Smith Mine, including historic sample stations TSP-3, TSP-6, and TSP-8. Two additional background surface water samples were collected within the Tim Smith Drainage above the Tim Smith Mine, including historic sample station TSP-9 and sample station TSP-10 (Figure 2-3). The RWP did not call for a sample from TSP-10; however, a sample was collected when flow was observed at this location during the May 2011 Task Order No. 9 sampling efforts.

Discharge was measured at sample stations using the mid-point velocity method with the exception of sample station TSP-10, a spring originating from the Tim Smith spring house, which was measured using the bucket and stopwatch method. Field parameters were recorded for each sample, and samples were analyzed for total recoverable metals, and laboratory parameters in accordance with the RWP.

Groundwater

No groundwater samples were collected at the Tim Smith AOC.

2.2.2.3 Summary of Hazardous Materials Inventory

Suspect Asbestos-Containing Materials

A total of three samples (HM-ASB-43 through HM-ASB-45) were collected from two unique suspect building materials identified in the two buildings/structures (north building and the spring house) located in the Tim Smith Mine AOC (Figure 2-4). Suspect building materials were not identified in the third building (south building) located at the Tim Smith Mine AOC. The field samples were labeled "HM", but were collected from the Tim Smith Mine AOC. Suspect building materials included green composite roofing and corrugated fiberglass siding. Two samples were collected from the green composite roofing and one sample was collected from the corrugated fiberglass siding. A description of each sampled material is presented in Appendix A.

Other Hazardous Building Materials

Two buildings and one structure were inspected for cooling systems with potential CFCs. Materials identified during these inspections are discussed in Section 3.4.3.2.

2.2.3 Historic Mine AOC

Sample locations at the Historic Mine AOC are shown on Figure 2-5 and Figure 2-6.

2.2.3.1 Summary of Solid-Matrix Sampling

Waste Rock

Eight test pits were excavated at the Historic Mine AOC to determine the limits and volume of waste rock dumps and to characterize waste rock and underlying soil. Test pits were completed at three areas within the Historic Mine AOC: the Harrison Shaft waste rock area, the Harper Shaft waste rock area, and the Lewis Shaft waste rock pile. Four test pits (HM-RS-01, HM-RS-02, HM-RS-03, and HM-RS-04) were completed in the Harrison Shaft waste rock area, three test pits (HM-RS-05, HM-RS-06, and HM-RS-07) were completed in the Harper Shaft waste rock area, and one test pit (HM-RS-08) was completed in the waste rock pile adjacent to the Lewis Shaft. Test pits were excavated to approximately one foot below the native soil/waste rock interface, with the exception of the test pit at sample location HM-RS-01. This test pit was excavated to the maximum reach of the excavator. Composite waste rock samples were collected from each test pit across the sample intervals shown in Table 2-1. A total of twelve, composite waste rock samples were collected and analyzed. The near-surface composite samples were analyzed for total recoverable metals, ABA, and moisture content, while the deeper composite

samples were analyzed for total recoverable metals and moisture content. Two of near-surface samples (HM-RS-01 and HM-RS-05) were analyzed for geotechnical properties to determine engineering properties, such as maximum density and optimum moisture content, which will be used in designing the placement of impacted materials in a repository.

Soil

Composite soil samples from approximately one foot below the native soil/waste rock interface were collected from test pits HM-RS-03 and HM-RS-04 (Harrison Shaft waste rock), and HM-RS-07 (Harper Shaft). The three, native soil samples were analyzed for total recoverable metals and moisture content. Discernable interfaces between the waste rock and native soil were not observed in test pits HM-RS-01, HM-RS-02, HM-RS-05 and HM-RS-06. Each of the composite samples collected from these locations were classified as waste rock during the field sampling.

To approximate the limits and volume of impacted soils and to characterize potential soil impacts in the Historic Mine AOC, potentially impacted surface soils were collected from eight locations: four downgradient of the Harrison Shaft, two downgradient of the Harper Shaft, and two near the Lewis Shaft. Surface soil samples were collected from zero to 0.5 foot bgs, and were analyzed for total recoverable metals, ABA and moisture content.

Sediment

One sediment sample (HM-SD-01) was collected from Mill Creek, at the location of historic surface water sample location MCSP-1. The sediment sample was analyzed for total recoverable metals and moisture content.

2.2.3.2 Summary of Water-Matrix Sampling

Surface Water

Two surface water samples were collected from the Historical Mine AOC to compare analytical results to historical data and to provide additional data to support the risk assessment. One surface water sample was collected from Mill Creek at sample station MCSP-1 (Figure 2-5). The discharge was measured using the mid-point velocity method. The second surface water sample (Road Cut) was collected during the May 2011 Task Order No. 9 field activities in the ditch adjacent to the south side of the road from the Lewis Shaft to the Combination Mill. This sample was not listed in the RWP, but was requested in the field by DEQ. Discharge was not measured at the Road Cut sample location. The water samples were analyzed for total recoverable metals, laboratory parameters, and field parameters in accordance with the RWP.

Groundwater

No groundwater samples were collected from the Historical Mine AOC.

2.2.3.3 Summary of Hazardous Materials Inventory

Suspect Asbestos-Containing Materials

A total of 8 samples (HM-ASB-01 through HM-ASB-03, HM-ASB-34, HM-ASB-35, and HM-ASB-40 through HM-ASB-42) were collected from five unique suspect building materials identified in the five buildings/structures located at the Historic Mine AOC. Suspect building materials included; silver foil vapor barrier, vent sealant, two types of grout, and corrugated fiberglass siding. Multiple, individual samples were collected from the silver foil vapor barrier and the corrugated fiberglass siding. A description of each sampled material is presented in Appendix A. Asbestos was detected in the sample (HM-ASB-35) collected from grout at the collapsed Harrison Shaft rubble.

Other Hazardous Building Materials

Five buildings/structures were inspected for cooling systems with potential CFCs and for fluorescent light fixtures and HID lights. No CFC based cooling systems, or fluorescent or HID lights were observed.

2.2.4 Combination Mill AOC

Sample locations at the Combination Mill AOC are shown on Figure 2-7 (Combination Mill), Figure 2-8 (South Fork Lower Willow Creek), Figure 2-9 (upstream synoptic sampling), Figure 2-10 (downstream synoptic sampling), and Figure 2-11 (hazardous materials sampling).

2.2.4.1 Summary of Solid-Matrix Sampling

Tailings

Test pits were completed at the Combination Mill AOC to provide additional data for waste characterization, allow for comparison to previous soil/tailings samples, and determine tailings/impacted soil limits and volumes. Eight test pits were completed in the Combination Mill tailings impoundment (CML-TS-01 through CML-TS-08), one test pit was completed near the footprint of the former Combination Mill (CML-TS-09), and one test pit was completed adjacent to the “Old Mill” on the west side of South Fork Lower Willow Creek (CML-TS-10) (Figure 2-7). The test pits were excavated to approximately one foot below visually impacted soil/tailings or to refusal (cobbles). Tailings samples were collected at ground surface and 2 to 4 feet bgs, with the exception of CML-TS-08 and CML-TS-09. Tailings samples were collected from CML-TS-08 from the surface and at five to seven feet bgs. An obvious soil/tailings interface was not encountered in test pit CML-TS-09; samples were collected into the interface with the underlying cobble. Tailings samples were collected from test pit CML-TS-09 at the surface and at depths of two to four, four to six, and six to eight feet bgs. A total of 22 tailings samples were collected from the 10 test pits.

The surface tailings samples were analyzed for total recoverable metals and moisture content. The near-surface tailings samples were analyzed for total recoverable metals, ABA, and moisture content.

Soil

Nine native soil samples were collected at depths ranging between four to nine feet bgs from the 10 test pits excavated at the Combination Mill AOC. A soil sample was not collected in CML-TS-09 because the test pit was dug at the Combination Mill and native soil was not visually identified. The samples were collected from one foot below the native soil/tailings interface. The soil samples were analyzed for total recoverable metals and moisture content.

An additional test pit (CML-SS-11) was excavated across South Fork Lower Willow Creek in an area identified by USFS as a potential repository location. Soil samples were collected from this test pit at one to three feet bgs and at eight to ten feet bgs. The shallow sample was analyzed for total recoverable metals, ABA, and agricultural properties. The sample collected at eight to ten feet bgs was analyzed for total recoverable metals, ABA, and agricultural properties. This deeper sample was also submitted for geotechnical testing to determine suitability for use as repository cover, liner, or berm material, and to determine compaction and moisture conditioning requirements. This test pit is discussed in Section 7, Preliminary Repository Site Investigation.

Sediment

Sediment samples were collected to determine recovery conditions, approximate the extent of contaminated in-channel sediment and floodplain deposits upstream and downstream of the mill, provide support for the risk assessment, and provide information for the EEE/CA. Fifteen sediment samples were collected adjacent to and downstream of the Combination Mill. Thirteen of those samples were collected from sediments in South Fork Lower Willow Creek (or tributaries), one sample was collected from sediment in the impoundment at the north end of the tailings (north sediment pond), and one sample from sediment in the impoundment located adjacent to the Mill Creek channel (south sediment pond) (Figure 2-7 and Figure 2-8). A sixteenth sediment sample (CML-SD-05) was collected upstream of the Combination Mill near the confluence of the Tim Smith Drainage and South Fork Lower Willow Creek (Figure 2-3). Five of the downstream sediment sample locations were identified in the field based on observations of suspected tailings deposition downstream of the tailings impoundment, along the floodplain of South Fork Lower Willow Creek. Sediment samples were collected from zero to 0.5 feet bgs, and were analyzed for total recoverable metals and moisture content.

Additional depositional sediment sampling was completed within the South Fork Lower Willow Creek floodplain west of the tailing impoundment. A sampling grid based on a 200 foot (north-south) by 100 foot (west-east) spacing was used to cover the floodplain area, beginning upstream of the former Combination Mill and continuing downstream to the Trust property boundary (Figure 2-7). Surface samples were collected from the 29 grid intersection locations (CML-SD-18 through CML-SD-46) at zero to 0.5 feet bgs. An additional seven samples (CML-SD-19, CML-SD-20, CML-SD-23, CML-SD-24, CML-SD-31, CML-SD-33, and CML-SD-42) were collected at approximately one foot beneath the interface of native soil/sediments and tailings

sediment. Sample depths for these samples ranged from one to three feet bgs. The seven near surface samples were co-located with the surface samples. A distinction between tailings sediments and native soil/sediments was not observed in the other 22 grid sample locations. The samples were analyzed for total recoverable metals and moisture content.

2.2.4.2 Summary of Water-Matrix Sampling

Surface Water

Sixteen surface water samples and two field duplicate samples were collected at the Combination Mill AOC as part of the synoptic sampling event described below. In addition to the synoptic sampling, two surface water samples were collected from the tailings impoundment north sediment pond located near the Trust property boundary (CML-SW-07) and the south sediment pond adjacent to Mill Creek (CML-SW-06).

Synoptic Sampling

The Combination Mill AOC has been identified as a source of metals loading to South Fork Lower Willow Creek. Mine tailings from the Combination Mill AOC are fluvially transported downstream during flood events onto lands administered by the USFS. These mine tailings are deposited throughout the creek and its associated floodplain. Additional potential metals sources to South Fork Lower Willow Creek include the ephemeral streams draining the Historic Mine AOC (Mill Creek) and the Tim Smith Mine AOC (Tim Smith Drainage) and two unnamed tributaries that enter South Fork Lower Willow Creek from the west downstream of the Combination Mill. Synoptic sample stations were located downstream of the tailings impoundments and immediately upstream and downstream of the confluence of the tributaries with South Fork Lower Willow Creek. The synoptic sample stations are presented on Figures 2-9 and 2-10.

A total of 18 surface water samples, including two field duplicates, were collected from South Fork Lower Willow Creek as part of the synoptic sampling event and sampling of the tailings impoundment sediment ponds conducted on June 15, 2011. Surface water samples were analyzed for total recoverable metals, laboratory parameters, and field parameters in accordance with the RWP. Discharge was also measured at each sample location.

Groundwater

No groundwater samples were collected at the Combination Mill AOC.

2.2.4.3 Summary of Hazardous Materials Inventory

Suspect Asbestos-Containing Materials

A total of four samples (CML-ASB-36 through CML-ASB-39) were collected from four suspect building materials identified in the three buildings/structures located in the Combination Mill AOC. Suspect building materials included; black vapor barrier and three types of grout. A description of each sampled material is presented in Appendix A.

Other Hazardous Building Materials

Three buildings/structures were inspected for cooling systems with potential CFCs and for fluorescent light fixtures and HID lights. No CFC based cooling systems, or fluorescent or HID lights were observed.

Building Materials

One wood sample and one brick sample were collected at the Old Mill site (CML-RCRA-01 and CML-RCRA-02) and the Combination Mill site (CML-RCRA-03 and CML-RCRA-04 – Figure 2-11). The samples were destructive samples that were analyzed for RCRA metals.

2.3 Deviations from the RWP

Sample identification numbers were modified in the RI from those listed in the RWP to simplify the sample identifications. BP (standing for Black Pine) and the sample depth numbers at the end of the sample identification were removed in this RI report. As an example, sample BP-CML-SD-15-00 (sediment sample collected in the Combination Mill AOC at a depth of 0 to 0.5 feet bgs) as identified in the RWP is identified as CML-SD-15 in the RI. The analytical result tables in Appendix B include the RI location, the field/sample identification number, and the lab identification number to allow for cross-referencing between the RWP, field notes, laboratory reports, and the RI.

In addition to altering sample identification scheme, other deviations from the RWP were incorporated during completion of the RI field work and reporting. The number of samples, sample locations, and sample depths were modified in the field based on observed field conditions. Sample depths and locations were modified based on visual inspection. For example, samples from test pit CMN-SS-04/CMN-RS-04 were collected at depths of zero to one, two to four, five to seven, and eight to ten feet bgs as opposed to zero to 0.3, 10, 15, and 25 feet bgs as listed in the RWP based on visual inspection of the material. A sample was not collected from 25 feet bgs this location because native soil was encountered before that depth. Depths of samples collected during the RI are listed in Table 2-1. Final sample locations are shown on Figures 2-1 through 2-11 and Figure 2-12. Deviations in sample depths and locations are not discussed below for each location. Other deviations from the RWP are listed below.

- Cobalt was not included in the initial analysis of solid media due to a miscommunication with the laboratory, but was analyzed later because Cobalt is listed in DEQ RBCGs as a contaminant of potential concern for soil and sediment at abandoned mine sites.

- The metals list for surface water and groundwater samples collected under Task Order No. 9 (included samples from the Combination Mine AOC as well as sample locations TSP-10 and Road Cut) differed from the metals list in the RWP as Task Order No. 9 was executed prior to development of the RWP. The list of metals

specified in Task Order No. 9, based on historical sampling in the Combination Mine AOC, included arsenic, cadmium, copper, iron, lead, manganese, and zinc. Antimony, barium, chromium, mercury, nickel, and silver were not included.

- Moisture content was included as part of the analyses of each solid media sample, as opposed to only select samples as outlined in the RWP. Moisture content was completed for each solid media sample because the laboratory collects this data for every solid media sample they receive and to provide information for waste material management (dewatering or moisture conditioning) and underlying soils properties.

- The number and depth of samples analyzed for ABA varied from those listed in the RWP. ABA analysis was added for subsurface samples collected from CMN-SS-07 through CMN-SS-13. ABA analysis for the subsurface samples from these test pits was in addition to ABA analysis of surface samples from these locations. ABA analysis was completed on the shallow subsurface samples as opposed to the surface samples from tailings test pits CML-TS-01 through CML-TS-08. ABA analysis was not completed for a sample collected from CML-TS-09. The additional ABA analyses and alterations in samples depths analyzed for ABA were modified in the field based on observed field conditions.

- Three borings (CMN-RS-01 through CMN-RS-03) at the Combination Mine were not drilled due to the existence of previous borings located at the waste rock pile and the requirement to mobilize a second (air rotary) drill rig to install temporary borings/monitoring wells. As a result of these borings not being installed, monitoring wells CMMW-10, CMMW-11, and CMMW-12 were not installed and groundwater samples were not collected. Similarly, geotechnical test listed in the RWP to be performed on waste rock samples from these borings were not completed.

- Selenium was included in the metals analyses for the sample collected from CML-SS-17 due to a laboratory error. Selenium was not included in the RWP metals list.

- Seep sample CPS-10B was identified in the RWP as CPS-10, but was changed to CPS-10B to match a previous sampling identification based on DEQ input.

- Seep samples from the North Removal Area (NRAD) and South Removal Area (SRAD) drainages at the Combination Mine AOC were not collected because the seeps were not flowing during the seep sampling.

- Seep sample North Runoff was identified in the RWP as NR-01, but was changed to North Runoff to match a previous sampling identification.

- Seep sample North Area Spring (N) was identified in the RWP as NORTH, but was changed to North Area Spring (N) to match a previous sampling identification.

- Sample TS-SS-02 was sampled at a depth of two to four feet bgs as opposed to 25 feet bgs as listed in the RWP based on visual inspection of the material. TS-RS-02 was not collected because the visual inspection identified the surface materials as native material that was pushed downgradient to create a bench for the Tim Smith No. 1 Adit.

- The test pit for samples TS-RS-04/TS-SS-04 was not excavated due to the clear visual distinction between native material and waste rock observed in test pit location TS-RS-01/TS-SS-01 and along the toe of the waste rock dump.

- The test pit for samples TS-RS-05/TS-SS-05 was not excavated due to the clear visual distinction between native material and waste rock along the toe of the waste rock dump.

- One boring (TS-RB-01) at the Tim Smith No. 1 adit was not drilled due to the clear visual distinction between native material and waste rock and the requirement to mobilize a second (air rotary) drill rig.

- The test pit for samples TS-RS-06/TS-SS-06 was not excavated due to the clear visual distinction between native material and waste rock.

- Sample TS-SS-08 was sampled at a depth of one to three feet bgs as opposed to 25 feet bgs as listed in the RWP based on visual inspection of the material. TS-RS-08 was not collected because the visual inspection identified the surface materials as native material.

- TSP-10 was not in the RWP but was added at the request of DEQ to characterize the water coming out of the Tim Smith spring house.

- Three asbestos samples (HM-ASB-43 through HM-ASB-45) were collected from structures in the Tim Smith Mine AOC to characterize suspect materials identified in the field. These samples were not included in the RWP.

- HM-SS-01 was not collected at a depth of 10 feet bgs as listed in the RWP because a distinction between waste rock and native material was not apparent in the field.

- HM-SS-02 was not collected at a depth of 10 feet bgs as listed in the RWP because a distinction between waste rock and native material was not apparent in the field.

- HM-SS-05 was not collected at a depth of 10 feet bgs as listed in the RWP because a distinction between waste rock and native material was not apparent in the field.

- Geotechnical testing was performed on the sample collected from HM-RS-06 at a depth of one to three feet bgs instead of HM-RS-05 based on the material encountered in the field.

- HM-SS-06 was not collected at a depth of 10 feet bgs as listed in the RWP because a distinction between waste rock and native material was not apparent in the field.

- HM-SS-08 was not collected due to the lack of an apparent waste rock and native material interface.

- An additional surface water location (ROAD CUT) was sampled at the Historic Mine AOC based on a request by DEQ. This sample was not listed in the RWP.

- A sample from CML-TS-02 was not submitted for geotechnical testing as specified in the RWP based on concerns with how to handle potentially mercury-contaminated materials in the geotechnical laboratory.

- A sample from CML-TS-06 was not submitted for geotechnical testing as specified in the RWP based on concerns with how to handle potentially mercury-contaminated material in the geotechnical laboratory.

- No soil sample was collected from location CML-TS-09 due to the consistent gradation of the material that was excavated from the test pit.

- Two samples were collected (CML-SS-11) at depths of one to three and eight to ten feet bgs as opposed to three samples at depths of zero to 0.3, two, and four feet bgs as listed in the RWP based on visual inspection of materials. Both samples were classified as soil samples based on lack of tailings material in the test pit. Only one sample was submitted for geotechnical testing, as opposed to the three samples listed in the RWP based on observations of materials in the field.

- Sediment and surface water samples (CML-SD-12/CML-SW-12) were not collected from a historic sample location (012) due to the lack of water in the drainage during the sampling event.

- Samples as part of the grid sampling were not collected at depth in locations where tailings were not visible or where there was not an apparent distinction between the surface sediments/soil and the underlying native sediments/soil at the Combination Mill AOC. Seven samples, CML-SD-19, CML-SD-20, CML-SD-23, CML-SD-24, CML-SD-31, CML-SD-33, and CML-SD-42, were co-located with surface samples and collected at depths ranging from one to three feet bgs.

- Four RCRA samples, CML-RCRA-01 through CML-RCRA-04, were collected as opposed to up to eight samples as listed in the RWP based on uniform material located at the Combination Mill AOC.

- Two geotechnical samples each were collected from test pits RY-SS-01, RY-SS-02, and RY-SS-03 based on visual inspection of materials and/or limited depths instead of four samples as listed in the RWP. Similarly, two samples each for analytical

testing were collected from test pits RY-SS-02, and RY-SS-03 based on visual inspection of materials and/or limited depths. Only the surface sample from RY-SS-01 was submitted for analytical testing based on the homogeneous materials.

- Two geotechnical and three analytical samples were collected from test pit RY-SS-04 as opposed to four samples for each as listed in the RWP based on visual inspection of materials.

- Two geotechnical and two analytical samples were collected at RY-SS-05, which was not listed in the RWP. This location in the potential Repository 3 area was sampled because the existing topography and lack of trees provided a good potential repository location. The area was also investigated as a potential borrow material source.

- Four monitoring wells, MW-RY-06, MW-RY-07, MW-RY-08, and MW-RY-09 were installed around the potential Repository 2 location near the Harrison and Harper shafts to provide baseline information for the potential repository. One geotechnical and two analytical soil samples each were collected from borings MW-RY-06 and MW-RY-07. One geotechnical and one analytical soil sample was collected from boring MW-RY-08. No samples were collected for laboratory testing from MW-RY-09, which was drilled with an air rotary rig. The total depths of the borings and screened intervals of the wells were 28 feet bgs/3 to 13 feet bgs (MW-RY-06), 26 feet bgs/3 to 13 feet bgs (MW-RY-07), 9 feet bgs/3 to 9 feet bgs (MW-RY-08), and 32 feet bgs/10 to 30 feet bgs (MW-RY-09). The shallow screening intervals were selected in the field based on observations of soil moisture during test pitting and boring installation. The monitoring wells were dry and no groundwater samples could be collected. The three monitoring wells were installed in place of RY-MW-1, which was listed in the RWP. RY-MW-1 was planned to be installed to a total depth of 60 feet bgs or until groundwater was encountered. No soil samples were listed in the RWP to be collected from RY-MW-1.

- The boring/monitoring well (RY-MW-1) proposed to be completed near the proposed Repository 1 was not completed based on shallow bedrock observed during test pit excavations.

- Three (MW-RY-06 through MW-RY-08) of the four borings were advanced with a hollow stem auger drill rig, rather than an air rotary drill rig, as originally proposed in the RWP.

- Background samples BG-SS-01 through BG-SS-04 listed in the RWP initially were not collected due to miscommunication with the field teams. The samples were not collected in subsequent sampling because the risk assessment determined that the soils samples collected as part of the repository investigations could be used as background samples.

- With the exception of the standard proctor for the soil sample form MW-RY-06, standard proctors were completed using AASHTO T99 Method C and AASHTO T180 Method C instead of ASTM D698, as listed in the RWP. Due to the large amounts of gravel removed from the samples, the volumes of soil remaining for testing were reduced. The AASHTO methods were used as they allow re-use of molded samples; therefore, requiring a smaller soil sample volume than ASTM D698.

- Specific gravity tests were performed using AASHTO Method T85 and AASHTO Method T100-03 rather than ASTM D854. The different methods were run as a result of the AASHTO methods used for the proctors.

- Consolidated undrained triaxial shear testing was not performed on samples collected from CMN-SS-11 or TS-RS-01, as proposed in the RWP. These tests were not performed based on the cost and time involved with the test as compared to the minimal value provided by the tests at the early project stage.

2.4 Post Sampling Activities

While in the field, both solid and water samples were logged in field logbooks, which included the date, time, sample identification, description of material sampled, and field parameters. The samples were maintained on ice in sealed coolers, and were in the custody of Herrera/Trihydro samplers or secured in a locked vehicle. Soil, waste rock, and water samples were shipped to Pace Analytical Services, Inc. (Pace Analytical) in Billings for the analyses outlined in the RWP. The repository geotechnical samples were delivered to Pioneer Technical Laboratories in Helena.

3.0 Site and Waste Characterization Results

Discussions of the analytical results for the samples collected from the BPM during the RI, by AOC and media type, are presented below in Section 3. Complete analytical results are tabulated in Appendix B; the laboratory reports are provided in Appendix C. The tabulation of analytical results in Appendix B contains the location, sample ID, field sample ID, laboratory batch ID, and laboratory sample ID to allow for cross referencing with the laboratory reports in Appendix C. Characterization of the waste is used in Sections 5 and 6 (Human Health and Ecological Risk Assessments, respectively) to assess the potential risk to human health and the environment, and in Section 7, Repository Investigation, to estimate the waste material volumes. The degree and extent of impacted wastes will be used during the reclamation design phase of the project to identify preferred reclamation alternatives.

Both solid (waste rock, tailings, soil, and sediment) and water (surface water/seeps) matrix data were compared to the DEQ risk-based cleanup guidelines (RBCG) for abandoned mine sites (DEQ 1996). The solid and water RBCG used for this site are receptors (composite, conservative for recreational visitors) exposed through a maximum use scenario (50-day gold panner/rock hound scenario).

In addition to the RBGC, analytical results for surface water/seeps were compared to the acute and chronic aquatic life standards (AALS and CALS, respectively) in the "Montana Numeric Water Quality Standards," Circular DEQ-7 (Circular DEQ-7) (DEQ 2010). Surface water/seeps and groundwater also were compared to the Circular DEQ-7 human health standards (HHS).

Fifteen buildings/structures, in various states of disrepair, were identified across the BPM as potentially containing hazardous materials. Field teams investigated these buildings, inventoried materials, and collected samples of potential asbestos materials. The wastes and/or hazards identified in the buildings/structures are discussed below in Sections 3.3 through 3.6 for each AOC.

3.1 Data Validation Summary

Analytical data were validated according to the EPA Contract Laboratory Program (CLP) National Functional Guidelines for Inorganic Superfund Data Review, document number EPA 540R-10-011 (EPA 2010), or in accordance with the analytical method, as applicable. Field duplicate results were validated in accordance with U.S. EPA Region 1 Laboratory Data Validation Functional Guidelines for Evaluation of Organic Analysis (EPA 1996a). Data were evaluated to assess precision, accuracy, method compliance, and completeness as required in the RWP. The data validation process and results are summarized in the Executive Summary, Reclamation Investigation Report Data Validation and detailed in individual data validation reports, which are included in Appendix D. All data are considered acceptable with the exception of one data point for mercury in the soil sample collected between 3 and 5 feet bgs at sample location CMN-SS-08, which required rejection due to a failed matrix spike recovery. The

rejected data point (indicated by the addition of an R qualification [flag]) is considered unusable for investigation purposes. In addition, several non-conformances related to the analytical data requiring qualification of the data were identified during the data validation review. Data flags used include:

- J – estimated concentration
- JB – estimated concentration due to blank contamination
- R – rejected, data not usable
- U – evaluated to be undetected at the reporting limit
- UJ – estimated reporting limit

Data qualification flags are included with the associated qualified analytical results in the solid and water matrix tables presented in Sections 3.2 through 3.6.

The RWP specified that the percentage of usable sample data points must be 90% or higher of the total number of data points. One sample data point (the soil sample collected from 3 to 5 feet bgs at sample location CMN-SS-08) out of the 4,153 sample data points was deemed unusable. The final completeness of the data package was calculated at 99.98%, which is acceptable for site evaluation purposes.

During the course of reviewing analytical data, cobalt was noted to be missing from several of the laboratory reports. Pace Analytical resubmitted the analytical reports to include cobalt, but also removed silver from the revised laboratory reports. Silver results were added to the project database from the original laboratory reports and are included in analytical tables in Section 3. Both the revised (Appendix C-1) and original (Appendix C-2) analytical reports are provided in Appendix C.

3.2 Background Soil Samples

Eight soil samples were collected from sample locations in the proposed repository sites (test pits RY-SS-01 through RY-SS-05 and soil borings MW-RY-06 through MW-RY-08, Figure 2-12) to evaluate the background concentration of metals in surface soils at the BPM. Background soil concentrations are used as inputs in the Human Health (Section 5) and Ecological (Section 6) Risk Assessments. The metals concentrations detected in the background soil samples are compared to DEQ RBCG for composite, conservative soil cleanup guidelines for recreations visitors (DEQ 1996) in Table 3-1. The DEQ RBCG guideline for arsenic is 0.7 mg/kg for soil. At the BPM, the arithmetic mean background soil concentration is 32 times the soil cleanup guideline level, indicating a relatively high naturally occurring concentration of arsenic in the vicinity. DEQ RBCG allows for use of the 95th upper confidence limit (UCL) on the mean concentration from background soil as an alternative cleanup concentration (DEQ 1996).

Analytical results for background soil samples did not exceed DEQ RBCG or the 95th UCL (for arsenic) with the exception of concentrations detected for arsenic and manganese:

- Detected arsenic concentrations exceeded the site-specific 95th UCL (40.4 milligrams per kilogram [mg/kg]) in the surface samples from RY-SS-04 (74.7 mg/kg) and MW-RY-08 (52.1 mg/kg). These two locations are located along the northern limits of the Potential Repository 2 area, in an area that appears to be cross gradient from waste materials associated with the Harper and Harrison shafts.

- Detected manganese concentrations exceeded the DEQ RBCG (665 mg/kg) in background soil samples collected from RY-SS-02 (782 mg/kg), RY-SS-04 (1,300 mg/kg), RY-SS-05 (1,040 mg/kg), and MW-RY-07 (1,840 mg/kg). Sample location RY-SS-02 is located along the Black Pine Mine Road upslope (east) of the Potential Repository 1 area; RY-SS-05 is located south west of the Lewis Shaft, and MW-RY-07 is located downslope (west) of the Potential Repository 2 area.

Mean metals concentrations in the background soils were also calculated and compared to DEQ RBCG. The calculated mean metals concentrations in the background soil samples were below DEQ RBCG with the exception of the calculated mean manganese concentration (777 mg/kg).

3.3 Combination Mine AOC

3.3.1 Solid-Matrix Sampling Results

Four waste rock and 27 soil samples, including three soil samples from stockpiles in the Central Processing building, were collected from the Combination Mine AOC and analyzed for total recoverable metals and moisture content. Twenty-one of these samples were also analyzed for ABA. Sample locations are shown on Figures 2-1 and 2-2. Acid base accounting analysis was performed on the four waste rock samples and 17 of the 27 soils samples. The complete analytical results for solid-matrix samples collected at the Combination Mine AOC are presented in Appendix B-1; the laboratory reports are provided in Appendix C.

Total recoverable metals analytical results for waste rock and soils are compared against DEQ RBCG standards in Table 3-2 and discussed in Sections 3.3.1.1 and 3.3.1.2. Elevated metals concentrations appear to be limited to the waste rock samples collected from the Combination Mine waste rock pile, one surface soil sample (CMN-SS-13) collected near the lower extent of the South Soils Removal Area, and one composite soil sample (CMN-SS-19) collected from the northwestern soil stockpile in the Central Processing building.

Historical data for the Combination Mine AOC includes soil and waste rock data collected prior to the removal of impacted soils from the Combination Mine Soils Removal Areas and regrading of the Combination Mine waste rock pile between 2003 and 2006. The historical data also includes results for surface soil samples collected from the Combination Mine Soils Removal Areas by the DEQ in 2008. Table 3-3 was developed to provide comparisons between historical

analytical metal data and analytical metal data collected during this RI. Average concentrations have been calculated for each sampling event by area (e.g., background samples, waste rock samples, surface soil samples, etc.), and both the average and individual sample metals concentrations are compared to the DEQ RBCG. Comparisons between current RI data and historical data are also discussed below in Sections 3.3.1.1 and 3.3.1.2. Historical sample locations are shown on Figure 3-2 in Appendix E.

ABA results are tabulated in Table 3-4 and discussed in Section 3.3.1.3.

3.3.1.1 Waste Rock

Four waste rock samples were collected from three test pits (CMN-RS-4 [2 samples], CMN-RS-05, and CMN-RS-06). Surface and subsurface soil samples associated with the waste rock test pits are discussed with other soil sample results in Section 3.3.1.2. Detected concentrations for antimony, arsenic, copper, lead, mercury, zinc, and silver were significantly higher in these samples than concentrations detected in overlying and underlying soils samples. Concentrations of antimony, arsenic, cadmium, copper, lead, iron, silver, and zinc increased with sample depth. Other metals concentrations decreased with sample depth. The detected concentrations for these metals were also higher in the waste rock samples than concentrations in the other soil samples collected across the Combination Mine AOC, with the exception of the surface sample at CMN-SS-13 and the composite sample from CMN-SS-19.

The following summarizes comparison of detected metals concentrations in waste rock samples to DEQ RBCG or the 95th UCL (arsenic) (Table 3-2):

- Antimony exceeded the DEQ RBCG (293 mg/kg) in each of the waste rock samples. Concentrations ranged from 424 mg/kg in sample CMN-RS-04 from 2 to 4 feet bgs to 986 mg/kg from 5 to 7 feet bgs.

- Arsenic exceeded the 95th UCL (40.4 mg/kg) in each of the waste rock samples, ranging from 216 mg/kg in the sample collected from 2 to 4 feet bgs at CMN-RS-04 to 515 mg/kg in the sample collected at CMN-RS-06 from the same depth.

- Lead exceeded the DEQ RBCG (1,100 mg/kg) in each of the waste rock samples. Lead concentrations ranged from 1,910 mg/kg in the sample collected from 2 to 4 feet bgs at CMN-RS-04 to 3,820 mg/kg in the sample collected from 2 to 4 feet bgs at CMN-RS-06.

- Manganese exceeded the DEQ RBCG (665 mg/kg) in the sample collected at CMN-RS-05 (850 mg/kg). The detected concentration (652 mg/kg) in the sample collected at CMN-RS-06 was just below the DEQ RBCG.

- Detected concentrations did not exceed the DEQ RBCG for other metals analyzed, although copper concentrations were elevated in each of the waste rock samples as compared to the 2011 and historical (Table 3-3) background soil samples.

Waste rock at the Combination Mine was sampled in October 2000 and July 2001 prior to being graded and encapsulated in the Combination Mine waste rock pile. Metals-impacted surface soils located downgradient of the waste rock pile were sampled in October 2000 and July 2001. Impacted soils from this area (Combination Mine Soils Removal Areas, also referred to as the North and South Soils Removal Areas) were excavated and encapsulated within the Combination Mine waste rock pile (Hydrometrics 2010). The Combination Mine waste rock pile is now comprised of waste rock and the impacted surface soils excavated from the Combination Mine Soils Removal Areas. Therefore, historical waste rock and surface soil samples from the Combination Mine Soils Removal Areas (prior to excavation of impacted soils) should be representative of material analyzed as waste rock samples during the 2011 RI.

The following summarizes comparisons of detected metals concentrations in historical (2000 and 2001) and RI (2011) samples (Table 3-3). The list of metals analyzed during the 2011 RI was longer than the list of metals analyzed in historical samples. Therefore, Table 3-3 only includes those metals that were analyzed during both historical and 2011 RI sampling events. Historical sample locations are shown on Figure 3-2 in Appendix E.

- Metals concentrations in soil samples (both surface and subsurface) collected by Hydrometrics in 2000 were notably higher than metals concentrations in samples collected by Hydrometrics from similar areas in 2001. The 2000 soils samples were analyzed with x-ray fluorescence (XRF) and comparison with laboratory results showed the XRF results to be approximately 60% higher than the laboratory results (Hydrometrics 2001). The results for the 2000 soil sampling is provided in Table 3-3 for reference, but is not used for comparisons of 2011 RI and historical sample results. The 2001 samples were analyzed by an analytical laboratory and are considered more reliable. Data from 2001 is used for comparisons of 2011 RI data with historical sample results.

- Data for the 2001 surface soils samples is biased low as some of the data includes samples collected from peripheral, non-impacted areas. The historical data does not distinguish between soils samples collected within devegetated areas and peripheral areas.

- Antimony, mercury, and nickel were not analyzed in historical samples, with the exception of one background soil sample collected in 1993.

- The average arsenic concentration calculated for 2000 and 2001 waste rock samples (425 mg/kg) is similar to the average concentration calculated for RI waste rock samples (409 mg/kg). Arsenic concentrations in waste rock samples from 2000/2001 and the 2011 RI ranged from 216 mg/kg (CMN-RS-04) to 904 mg/kg (CWD-S).

The average concentration calculated for surface soil samples collected in 2001 (16.08 mg/kg) from the Combination Mine Soils Removal Areas was significantly lower than the 2011 waste rock concentrations. The highest arsenic concentrations in surface soil samples were detected

samples NTP-1 (43 mg/kg) located at the upper edge of the North Soils Removal Area, and STP-3 (34 mg/kg) located near the toe of the South Soils Removal Area.

- The average cadmium concentration calculated for 2000/2001 waste rock samples (16.14 mg/kg) is similar to the average concentration calculated for RI waste rock samples (10.63 mg/kg). Cadmium concentrations in waste rock samples from 2000/2001 and the 2011 RI ranged from 3.7 mg/kg (CMN-RS-04) to 37 mg/kg (CWD-S).

- The average cadmium concentration for surface soil samples collected in the Combination Mine Soils Removal Areas in 2001 was 5.58 mg/kg. Cadmium was not detected at a reporting limit of 10 mg/kg for each historical surface soil sample, except for NTP-8 (12 mg/kg), which was located at the toe of the North Soils Removal Area.

- The average copper concentration calculated for 2000/2001 waste rock samples (1,430 mg/kg) is similar to the average concentration calculated for RI waste rock samples (1,103 mg/kg). Copper concentrations in waste rock samples from 2000/2001 and the 2011 RI ranged from 309 mg/kg (CMN-RS-04) to 3,402 mg/kg (CWD-S).

- The average copper concentration for surface soil samples collected in the Combination Mine Soils Removal Areas in 2001 was 650 mg/kg. The highest concentrations were detected in surface soil samples collected from NTP-8 (3,405 mg/kg) and NTP-7 (1,419 mg/kg). NPT-7 was also located at the lower end of the North Soils Removal Area.

- The average lead concentration calculated for 2000/2001 waste rock samples (2,923 mg/kg) is similar to the average concentration calculated for RI waste rock samples (2,883 mg/kg). Lead concentrations in waste rock samples from 2000/2001 and the 2011 RI ranged from 1,540 mg/kg (Combination Pad Center Trench) to 6,393 mg/kg (CWD-S).

- The average lead concentration for surface soil samples collected in the Combination Mine Soils Removal Areas in 2001 was 68 mg/kg. The highest concentrations were detected in surface soil samples collected from STP-3 (241 mg/kg) and STP-1 (140 mg/kg). STP-1 was located at the top of the South Soils Removal Area.

- The average manganese concentration calculated for 2000/2001 waste rock samples (337 mg/kg) is similar to the average concentration calculated for RI waste rock samples (412 mg/kg). Manganese concentrations in waste rock samples from 2000/2001 and the 2011 RI ranged from 37 mg/kg (CMN-RS-04) to 850 mg/kg (CMN-SS-05).

- The average manganese concentration for surface soil samples collected in the Combination Mine Soils Removal Areas in 2001 was 814 mg/kg. The highest

concentrations were detected in surface soil samples collected from NTP-8 (2,865 mg/kg) NTP-6 (1,990 mg/kg), and NPT-7 (1,201 mg/kg), each located in the lower portion of the North Soils Removal Area.

- The average zinc concentration calculated for 2000/2001 waste rock samples (1,259 mg/kg) is higher than the average concentration calculated for RI waste rock samples (884 mg/kg). Zinc concentrations in waste rock samples from 2000/2001 and the 2011 RI ranged from 423 mg/kg (CMN-RS-04) to 2,578 mg/kg (CWD-S).

- The average zinc concentration for surface soil samples collected in the Combination Mine Soils Removal Areas in 2001 was 197 mg/kg. Similar to manganese, the highest concentrations were detected in surface soil samples collected from NTP-8 (541 mg/kg) NTP-6 (370 mg/kg), and NPT-7 (226 mg/kg).

Both the range of and average metals concentrations are similar between waste rock samples collected in 2000/2001 and waste rock samples collected during the 2011 RI. Historical sampling showed elevated metals concentrations in surface soils samples collected from the Combination Mine Soils Removal Areas, particularly in samples collected in the South Soils Removal Area. Metals concentrations in these samples were higher than concentrations detected in 2011 waste rock samples. The chemistry of the waste rock does not appear to have changed notably from 2001 to 2011.

3.3.1.2 Soil

Twenty-four soil samples were collected from 13 locations across the Combination Mine AOC. A surface and underlying soil sample were collected in each of the three waste rock test pits (CMN-SS-04, CMN-SS-05, and CMN-SS-06), and a surface and subsurface sample were collected from 8 test pits (CMN-SS-07 through CMN-SS-14) in, and downgradient of the Combination Mine Soils Removal Areas. Surface samples only were collected at two locations (CMN-SS-15 and CMN-SS-16). Except for elevated manganese concentrations in three surface samples (CMN-SS-05, CMN-SS-06 and CMN-SS-10), impacts appear to be limited to the area around CMN-SS-13 (Figure 2-1). Metals concentrations in the samples collected from surface soils and soils underlying the waste rock at CMN-SS-04, CMN-SS-05, and CMN-SS-06 were below DEQ RBCG, with the exception of manganese in the surface samples collected from CMN-SS-05 (928 mg/kg) and CMN-SS-06 (910 mg/kg). The detected manganese concentrations in these samples were also higher than the calculated average background concentration (777 mg/kg).

The following summarizes comparison of detected metals concentrations in soil samples to DEQ RBCG or the 95th UCL (arsenic) (Table 3-2):

- Antimony exceeded the DEQ RBCG (293 mg/kg) in the surface soil sample collected from CMN-SS-13 (396 mg/kg) and the composite sample collected from CMN-SS-19 (1,010 mg/kg).

- Arsenic exceeded the 95th UCL (40.4 mg/kg) in the surface soil sample collected from CMN-SS-13 (250 mg/kg) and the composite sample collected from CMN-SS-19 (537 mg/kg). Except for these two samples, arsenic concentrations ranged from 7 mg/kg in the sample collected from 6 to 8 feet bgs at CMN-SS-06 to 35 mg/kg in the surface sample collected at CMN-SS-04.

- Cadmium exceeded the DEQ RBCG (19.5 mg/kg) in the composite sample collected from CMN-SS-19 (67 mg/kg).

- Copper exceeded the DEQ RBCG (27,100 mg/kg) in the composite sample collected from CMN-SS-19 (56,800 mg/kg). This was the only sample collected during the RI to exceed the DEQ RBCG for copper.

- Lead exceeded the DEQ RBCG (1,100 mg/kg) in the surface soil sample collected from CMN-SS-13 (1,890 mg/kg) and the composite sample collected from CMN-SS-19 (1,860 mg/kg).

- Manganese exceeded the DEQ RBCG (665 mg/kg) the surface soil samples collected at CMN-SS-05 (928 mg/kg), CMN-SS-06 (910 mg/kg), and CMN-SS-10 (1,170 mg/kg), and the composite sample collected from CMN-SS-19 (989 mg/kg).

- Detected concentrations did not exceed the DEQ RBCG for other metals analyzed.

- Detected mercury concentrations did not exceed the DEQ RBCG; however, the subsurface soil sample collected at CMN-SS-09 (61.3 mg/kg) was significantly higher than mercury results from other samples. Mercury concentrations in other samples ranged from a non-detect with a reporting limit of 0.02 mg/kg at CMN-SS-04 to 1.4 mg/kg at CMN-SS-13. Other metals concentrations in the subsurface sample collected at CMN-SS-09 were not elevated. This elevated mercury concentration is likely an anomaly and does not appear to be representative of metals concentrations in the Combination Mine AOC.

Metals-impacted soils located downgradient of the waste rock pile were sampled in October 2000 and July 2001. Impacted soils from this area (Combination Mine Soils Removal Areas) were excavated and encapsulated within the Combination Mine waste rock pile sometime between 2003 and 2006 (Hydrometrics 2010). Following this action, DEQ collected eight soil samples (2008) from the Combination Mine Soils Removal Areas. The following summarizes comparison of detected metals concentrations in historical and RI samples (Table 3-3). As previously discussed, the data from 2000 was collected with an XRF and did not correlate with laboratory analysis for samples collected at the same time. Data collected in 2000 is listed in Table 3-3 but is not used in comparisons between 2011 RI data and historical data. Historical sample locations are shown on Figure 3-2 in Appendix E.

- Antimony, barium, chromium, cobalt, iron, mercury, and nickel were not analyzed in historical samples, with the exception of one background soil sample collected in July 1993. This background sample was analyzed for antimony (33.3 mg/kg), mercury (1.33 mg/kg), and nickel (6.77 mg/kg) in addition to lead, manganese, and zinc (tabulated in Table 3-3). Silver was only analyzed in 2000 soil sampling and most results were reported as non-detects at a reporting limit of 20 mg/kg.

- Both historical and 2011 RI surface soil samples exhibited higher metals concentrations as compared to subsurface soil samples.

- With the exception of arsenic and lead, calculated average metals concentrations were lower in the 2011 surface soil samples as compared to the 2008 and 2001 surface soil samples.

- Average metals concentrations in subsurface soil samples collected in 2011 were similar to average concentrations in subsurface soil samples collected in 2001. Subsurface soil samples were not collected in 2008.

- Average arsenic concentrations in surface soils samples collected in 2008 (7.16 mg/kg) were lower than the average 2001 concentration (16.08 mg/kg), which was lower than the average concentration calculated for surface soil samples collected in 2011 (36.57 mg/kg). Trends for average arsenic concentrations in subsurface soils mimic surface soils, with the highest average concentration calculated for samples collected in 2011 (12.08 mg/kg) as compared to 2001 (8.88 mg/kg). Average concentrations detected in 2011 were higher, but similar in magnitude to concentrations detected in surface and subsurface soils prior to excavation of impacted soils.

As discussed above for waste rock, the highest historical arsenic concentration were observed in surface soil samples collected from NTP-1 (43 mg/kg) located at the upper edge of the North Soils Removal Area, and STP-3 (34 mg/kg) located near the toe of the South Soils Removal Area. The highest arsenic concentration detected in 2011 was in a sample collected from CMN-SS-13 (250 mg/kg), which is located in the same approximate area as STP-3. The highest arsenic concentration detected in 2008 was in the sample collected from S-8 (25.2 mg/kg) located midslope in the South Soils Removal Area.

- Average cadmium concentrations in surface soils samples were similar for those collected in 2008 (6.96 mg/kg), 2001 (5.58 mg/kg), and 2011 (2.09 mg/kg). The average cadmium concentrations detected in 2001 subsurface soils (5.00 mg/kg) were higher as compared to average concentrations for samples collected in 2011 (0.94 mg/kg). There does not appear to be a notable trend in cadmium concentrations between samples collected prior removal of impacted soils and those collected after removal of the soils.

- The highest cadmium concentration was observed in the surface soil sample collected from S-7 (40.5 mg/kg) in 2008. This sample was collected from the southern, midslope edge of the South Soils Removal Area. The highest cadmium concentration detected in 2011 was in a surface sample collected from CMN-SS-13 (11.2 mg/kg).

- Average copper concentrations in surface soil samples collected in 2008 (532.6 mg/kg) were similar to the 2001 average concentration (650.2 mg/kg), and higher than the average concentration calculated for surface soil samples collected in 2011 (217.4 mg/kg). The average copper concentration detected in subsurface soils collected in 2001 (148.9 mg/kg) was similar, but higher than the average concentration calculated for 2011 (113.8 mg/kg).

- The highest concentrations were detected in surface soil samples collected from NTP-8 (3,405 mg/kg) and NTP-7 (1,419 mg/kg) in 2001 and S-7 (1,320 mg/kg) in 2008. The highest copper concentration detected in 2011 was in a sample collected from CMN-SS-14 (917 mg/kg). A notable trend is not apparent between samples collected prior to excavation of impacted soils and those collected after excavation, although concentrations were detected at lower levels in 2011 than during previous sampling events. The higher average concentrations for surface soil samples collected in 2001 and 2008 are affected by two high detections during each event.

- Average lead concentrations calculated in surface soils samples collected in 2011 (243.3 mg/kg) were higher than for samples collected in 2001 (68.42 mg/kg) and 2008 (38.61 mg/kg). However, the average concentration for surface soils collected in 2011 were highly influenced by the high detection (1,890 mg/kg) in the sample collected from CMN-SS-13, as well as the surface soils samples collected from the waste rock test pits (261 mg/kg [CMN-SS-04], 282 mg/kg [CMN-SS-05], and 217 mg/kg [CMN-SS-06]). Removing the result for CMN-SS-13 reduces the 2011 average concentration to 106 mg/kg, while also removing the results for the surface soils samples from waste rock test pits reduces the average concentration further to 57 mg/kg. The average concentrations for subsurface soil samples were similar between 2001 (33.27 mg/kg) and 2011 (30.47 mg/kg).

- The highest lead concentration was detected in the sample collected from CMN-SS-13 (1,890 mg/kg) in 2011. Lead concentrations in 2008 samples ranged from 7.1 mg/kg (S-7) to 183 mg/kg (S-8). Concentrations in the 2001 surface soil samples ranged from 18 mg/kg (NTP-2) to 241 mg/kg (STP-3), while concentrations in the 2001 subsurface soil samples ranged from 14 mg/kg (NTP-5) to 124 mg/kg (STP-1).

- Average manganese concentrations calculated in surface soil samples decreased from 2001 (814.3 mg/kg) to 2011 (528.2 mg/kg). Manganese was not analyzed in 2008. The average manganese concentrations were similar between 2011 (317.8 mg/kg) and 2001 (231.1 mg/kg).

- The highest concentrations were detected in surface soil samples collected from NTP-8 (2,865 mg/kg), NTP-6 (1,990 mg/kg), and NTP-7 (1,201 mg/kg); each located in the lower portion of the North Soils Removal Area. The highest manganese concentration detected in 2011 was in the sample collected from CMN-SS-10 (1,170 mg/kg). Detected manganese concentrations in subsurface samples ranged from 45 mg/kg (NTP-8) to 467 mg/kg (NTP-6) in 2001, and from 56.9 mg/kg (CMN-SS-04) to 610 mg/kg (CMN-SS-11) in 2011.

- The average concentration calculated in 2008 (383.4 mg/kg) was higher than the 2001 (197.2 mg/kg) and 2011 (182.8 mg/kg) calculated average concentrations. The average zinc concentrations detected in subsurface soil samples were similar between 2001 (79.46 mg/kg) and 2011 (69.62 mg/kg).

- The highest historical zinc concentration was detected in the surface soil sample from NTP-8 (541 mg/kg). The highest zinc concentration detected in 2011 was in the surface soil sample collected from CMN-SS-13 (877 mg/kg).

Detected metals concentrations in the 2011 RI soil samples were similar to concentrations detected in soil samples collected in 2001 (prior to impacted soils excavation) and 2008 (post excavation of impacted soils). While metals concentrations in some samples collected during 2011 exceeded DEQ RBCG, there was not a noticeable increase in metals concentrations from sampling performed in 2008 or 2001. There does appear to be remaining metals impacts to soils in the South Soils Removal Area, just above the Trust property boundary (CMN-SS-13). Based on a review of the historical data, this area had high metals concentrations prior to removal of the impacted soils between 2003 and 2006.

3.3.1.3 Acid Base Accounting

ABA is a method of examining the naturally occurring levels of basic material in soils (e.g. lime) versus the amount of acid generating materials the soil contains (e.g. sulfur) and how the two elements may interact over time. ABA analyses are used to evaluate the amount of sulfur, pyritic sulfur, organic sulfur, and sulfate sulfur in waste and to estimate the potential of the soil/waste to generate acidity when it contacts water.

ABA also provides an estimate for the quantity of lime required to neutralize the overall acid potential of the waste. This quantity is developed by evaluating the acid potential versus the neutralization potential. Together, the levels of basic material and acid generating materials provide a measure of whether a material is likely to generate acid when exposed to water over time, or if the natural buffering capacity (e.g. lime) of the material will offset the acid generating material effects. Often, the sulfur contents of the mine waste exceed its buffering capacity due to weathering or leaching of the material. In these cases, additional lime is required to counteract the acid potential.

Four waste rock and 17 soil samples were analyzed for ABA. The results from the ABA analyses are tabulated in Table 3-4 and Appendix B-1. The results are summarized below:

- Sulfur levels in the samples ranged from <0.05% to 0.51%
- Acid potential ranged from <4.3 tons/1,000 tons (t/kt) to 6.5 t/kt
- Neutralization potential ranged from <0.5 t/kt to 11 t/kt
- Lime requirements ranged from <5.4 t/kt to 13 t/kt
- Acid base potential or net neutralization potential ranged from -6.4 t/kt to 4.2 t/kt

The acid base potential or net neutralization potential falls within the -20 t/kt to +20 t/kt, which is considered to have uncertainty and the potential to generate acid exists (EPA 1994a). Lime amendments, if necessary, are low and would require a maximum of 13 tons of lime for every 1000 tons of waste.

3.3.2 Water-Matrix Sampling Results

Ten surface water/seep samples, one surface water/seep duplicate sample, nine groundwater samples, and one groundwater duplicate sample were collected from seeps, ditches, and monitoring wells at the Combination Mine AOC. Field parameters were collected for each water sample and the samples were submitted to Pace Analytical for analysis of total recoverable metals (surface water), total dissolved metals (groundwater), and laboratory parameters. The complete analytical results, including field and laboratory parameters, for water-matrix samples collected at the Combination Mine AOC are presented in Appendix B-2 (surface water) and Appendix B-3 (groundwater); the laboratory reports are provided in Appendix C. Surface water results are presented in Tables 3-5 and 3-6 and discussed in Section 3.3.2.1. Groundwater results are discussed in Section 3.3.2.2.

Tables 3-7 (surface water) and 3-9 (groundwater) were developed to provide comparisons between historical analytical data and analytical data collected during this RI. These tables include metals concentrations detected in samples collected from seeps since October 2000 and groundwater since November 2001. Comparisons between current RI data and historical data are also discussed below in Sections 3.3.2.1 and 3.3.2.2. Historical sample locations are shown on Figure 3-3 in Appendix E. Trend graphs for select seep locations and groundwater wells are provided in Appendix F-1 (surface water), Appendix F-2 (groundwater), and Appendix F-3 (fluid levels).

3.3.2.1 Surface Water

Total recoverable metals analytical results for the 10 surface water samples and one duplicate water sample are compared against DEQ RBCG standards in Table 3-5 and Circular DEQ-7 in Table 3-6. Table 3-6 includes separate comparisons to HHS, AALS, and CALS standards. Several of the Circular DEQ-7 AALS and CALS standards, including cadmium, copper, lead, and zinc are based on total hardness. The standards listed in DEQ Circular-7, and listed in Table 3-6, are for a total hardness of 25 mg/L. One sample (collected from CPS-8) was

submitted for analysis of hardness. The total hardness for this sample (41 mg/L) exceeded the standard 25 mg/L. The appropriate standards are adjusted in the risk assessments for the elevated hardness. The standards were not adjusted in Table 3-6 as hardness was only analyzed in one of the samples. Additionally, the standards are more conservative (lower) for a total hardness of 25 mg/L as compared to a total hardness of 41 mg/L.

While metals concentrations in a number of samples (discussed in more detail below) exceeded either DEQ RBCG or Circular DEQ-7 standards, the highest metals concentrations were detected in the samples collected from CPS-1 (seep located in the lower portion of the North Soils Removal Area), CPS-7A (seep located on the northern/midslope border of the South Soils Removal Area), CPS-10B (seep located mid-slope in the North Soils Removal Area), and DTRD (located along the toe of, and directly affected by seepage through the Combination Mine waste rock pile). Cadmium, copper, lead (except CPS-1), manganese, and zinc concentrations detected in samples from these locations were roughly one order of magnitude higher than concentrations detected in samples from other locations. Samples collected from the seeps at these locations have historically shown elevated metals concentrations (Hydrometrics 2010).

Metals concentrations in downgradient sample locations, CPSW-1 and CPSW-2 exceeded arsenic, manganese and zinc DEQ RBCG. However, the metals concentrations detected in samples from these locations were on order with metals concentrations detected in the sample collected from CPS-2, which is located cross gradient from known impacted areas.

The following summarizes comparison of detected metals concentrations in surface water/seep samples to DEQ RBCG (Table 3-5):

- Arsenic exceeded the DEQ RBCG (0.06 micrograms per liter [µg/L]) in all 10 samples, as well as in the duplicate sample. Except for CPS-7A (54.7 µg/L), arsenic concentrations ranged from non-detect (below the 0.5 µg/L reporting limit) in the sample collected from CPS-1 to 4.5 µg/L in the sample collected from CPS-10B.

- Cadmium exceeded the DEQ RBCG (66.5 µg/L) in samples collected from DTRD (215 µg/L), CPS-1 (173 µg/L), and CPS-10B (132 µg/L). The concentration (52.9 µg/L) in the sample from CPS-7A was also elevated as compared to the other samples.

- Copper exceeded the DEQ RBCG (472 µg/L) in six seep samples (CPS-1, CPS-7A, CPS-10B, DTRD, North Area Spring (N), and North Runoff). The highest concentrations were detected in the samples from DTRD (20,900 µg/L), CPS-1 (11,100 µg/L), CPS-10B (8,600 µg/L), and CPS-7A (4,320 µg/L).

- Iron and lead exceeded the DEQ RBCG (4,979 µg/L and 47.1 µg/L, respectively) in the sample collected from CPS-7A (41,400 µg/L and 363 µg/L, respectively).

- Manganese exceeded the DEQ RBCG (16.6 µg/L) in samples from all locations except CPS-2 (13.9 µg/L). The highest concentrations were detected in the samples from DTRD (6,640 µg/L), CPS-1 (3,680 µg/L), CPS-10B (2,590 µg/L), and CPS-7A (938 µg/L).

- Zinc exceeded the DEQ RBCG (17.2 µg/L) in all 10 samples, as well as in the duplicate sample. The highest concentrations were detected in the samples from DTRD (20,400 µg/L), CPS-1 (12,600 µg/L), CPS-10B (9,720 µg/L), and CPS-7A (4,650 µg/L). Concentrations in the remaining samples ranged from 20.2 µg/L (CPS-2) to 1,310 µg/L (North Runoff).

The following summarizes comparison of detected metals concentrations in surface water/seep samples to Circular DEQ-7 standards (Table 3-6):

- Arsenic concentrations exceeded the HHS (10 µg/L) in the sample collected at CPS-7A (54.7 µg/L). Concentrations in other samples did not exceed the HHS, and no concentrations exceeded the AALS (340 µg/L), or CALS (150µg/L) standards for arsenic.

- Cadmium exceeded the HHS (5 µg/L) in all surface water samples except CPS-2, CPSW-1, and CPSW-2. Cadmium concentrations also exceeded the AALS (0.52 µg/L) in all samples, except for CPS-2, and the CALS (0.097 µg/L) in each of the samples. As discussed earlier in comparisons with DEQ RBCG, the highest cadmium concentrations were observed in samples from CPS-1, CPS-7A, CPS-10B, and DTRD.

- Copper exceeded the HHS (1,300 µg/L) in samples from DTRD (20,900 µg/L), CPS-1 (11,100 µg/L), CPS-10B (8,600 µg/L), and CPS-7A (4,320 µg/L). Copper also exceeded both the AALS (3.79 µg/L) and CALS (2.85µg/L) in all seep samples.

- Iron exceeded the HHS (300 µg/L) in each of the samples, except for CPS-1, and the CALS (1,000 µg/L) in each sample, except for CPS-1 and CPSW-2. AALS are not available for iron. The highest concentrations were detected in the samples from CPS-7A (41,400 µg/L) and CPS-10B (4,700 µg/L).

- Lead exceeded the HHS (15 µg/L) and AALS (13.98 µg/L) in samples from CPS-7A (363 µg/L) and DTRD (34.3 µg/L). Lead exceeded the CALS (0.545 µg/L) in each of the samples, except for CPS-1 (0.3 µg/L).

- Manganese exceeded the HHS (50 µg/L) in samples from DTRD (6,640 µg/L), CPS-1 (3,680 µg/L), CPS-10B (2,590 µg/L), CPS-7A (938 µg/L), North Area Spring (N) (113 µg/L), and North Runoff (152 µg/L). Manganese standards are not available for AALS or CALS.

- Zinc exceeded HHS (2,000 µg/L) in samples from DTRD (20,400 µg/L), CPS-1 (12,600 µg/L), CPS-10B (9,720 µg/L), and CPS-7A (4,650 µg/L). Detected zinc concentrations exceeded both AALS and CALS (both 37 µg/L) in samples collected from all locations except CPS-2 (20.2 µg/L).

Discharge rates for each surface water sample location are also tabulated in Tables 3-5 and 3-6. Seep discharge rates detected at the Combination Mine AOC ranged from 0.0002 to 0.23 cfs. The lowest discharge rates (less than 0.01 cfs) were detected at sample locations CPS-8, CPS-7A, and CPS-10B. The highest discharge rates (exceeding 0.10 cfs) were detected at the furthest downgradient seeps, CPSW-2, CPSW-1, and CPS-2.

Historical metals concentrations (analyzed as dissolved or total/total recoverable metals) are presented in Table 3-7. Historical sample locations are shown on Figure 3-2 in Appendix E. Metals concentrations detected in historical and 2011 RI samples are compared below, regardless of the analyses method (dissolved vs. total/total recoverable). Results for a sample analyzed as total/total recoverable metals would be higher or at least equal to results for the same sample if it were analyzed for dissolved metals. This is because the total/total recoverable analysis includes both metals dissolved in the water and particles in the water. However, in reviewing the historical data the variations between samples analyzed by the different methods (e.g., dissolved vs. total) do not appear to be more pronounced than the variations that exist between samples analyzed by the same method (e.g., dissolved). For example dissolved copper concentrations in samples collected from seep CPSW-2 varied from 55 µg/L in April 2004 to 314 µg/L in May 2005. Total copper concentrations for this same seep varied from 64 µg/L in October 2007 to 372 µg/L in April 2007. So while results for dissolved vs. total/total recoverable analyses would not typically be compared, they are compared below to allow discussion of overall concentration trends at individual sample locations.

Review of the historical data indicates that metals concentrations have declined substantially since grading and capping of the waste rock and installation of the seepage collection pumpback system. Metals concentrations detected in samples collected from CPS-1 have declined by nearly an order of magnitude (Figures F-1 and F-2 in Appendix F). While metals concentrations declined following 2003 to 2006 reclamation at the Combination Mine, the trend appears to have flattened out since this time.

Metals concentrations were historically highest in samples collected from CPS-9 and CPS-10A, which were located along the toe of the waste rock pile prior to regrading and capping. These seep locations are intended to be captured by the seepage collection system and are located under the regraded and capped Combination Mine waste rock pile. The sample location DTRD was located at a seep emanating from the toe of the Combination Mine waste rock pile in the area of the former CPS-10A location. Cadmium, copper, manganese, and zinc concentrations detected in this sample location were higher than in other samples collected during 2011. Other historical sample locations that have shown elevated metals concentrations include CPS-7, NRAD, and SRAD. Seep CPS-7 has not been sampled since 2001 (prior to reclamation actions), and sufficient flow did not exist in either the NRAD or the SRAD to collect samples during the 2011 RI. The SRAD did show elevated metals concentrations in 2008 (639 µg/L copper, 49,850 µg/L

iron, 66 µg/L arsenic, and 369 µg/L lead). The elevated metals concentrations at this location correlate with the elevated metals concentrations in the soil samples collected from CMN-SS-13.

The following summarizes comparison of detected metals concentrations in historical and 2011 RI samples (Table 3-7). Historical sample locations not shown on Figures 2-1 or 2-2 are shown on Figure 3-3 in Appendix E.

- The highest arsenic concentrations were detected in samples from CPS-10A (235 µg/L) prior to regrading and capping the waste rock. The highest arsenic concentrations since reclamation actions have been detected in samples from the SRAD (66 µg/L in 2008), CPS-7A (58 µg/L in 2009 and 54.7 µg/L in 2011), and the NRAD (47 µg/L in 2007). Nine of the 12 highest arsenic concentrations since reclamation of the waste rock and removal of the impacted soils have been detected at CPS-7A, the SRAD, or the NRAD. There does not appear to be a notable arsenic trend; sample results have varied widely across sampling events. Arsenic concentrations over time for samples collected from CPS-7A, NRAD, SRAD, and CPS-10A are plotted on Figure F-3.

- Similar to arsenic, the highest cadmium concentrations were detected in samples from CPS-10A (3,820 µg/L) prior to regrading and capping the waste rock. The highest cadmium concentrations since reclamation actions have been detected in samples from CPS-1 (432.7 µg/L in 2006) and CPS-10B (188.4 µg/L in 2008). Other sample locations that have shown higher cadmium concentrations include CPS-7A, North Drainage Runoff, and NRAD. Cadmium levels detected in samples from seeps CPS-1, the NRAD, North Drainage Runoff, and CPS-7A have declined substantially since regrading and capping of the waste rock and impacted soils. Cadmium trends for CPS-7A, NRAD, North Drainage Runoff, CPS-1, CPS-10B, and CPS-10A are shown on Figure F4 in Appendix F.

- The highest copper concentrations were detected in samples from CPS-10A (181,000 µg/L), CPS-1 (105,000 µg/L), and CPS-7 (80,600 µg/L) prior to regrading and capping the waste rock. Elevated copper concentrations following waste rock and impacted soils reclamation have been detected in samples from CPS-10B (13,050 µg/L in 2008), NRAD (11,730 µg/L in 2007), North Drainage Runoff (7,244 µg/L in 2007), and CPS-7A (4,320 µg/L in 2011). Currently, the highest copper concentrations are found in samples from the DTRD (located near historical seep CPS-10A [20,900 µg/L]) and CPS-1 (11,100 µg/L). Copper trends for CPS-7A, NRAD, North Drainage Runoff, CPS-1, CPS-10B, CPS-10A, and CPS-7 are shown on Figure F-5 in Appendix F.

- With the exception of CPS-10A (66,400 µg/L in 2001), the highest iron concentrations have been detected in samples collected since regrading and capping of the waste rock and impacted soils. The samples from the NRAD (ranging from 80 µg/L to 68,000 µg/L) have had the highest iron detections. Samples collected from CPS-7A in 2011 (41,400 µg/L), North Drainage Runoff in 2008 (23,040 µg/L), and

the SRAD in 2008 (49,850µg/L) have also exhibited high iron concentrations. Iron trends for CPS-7A, NRAD, North Drainage Runoff, SRAD, and CPS-10A are shown on Figure F-6 in Appendix F. These trends show sporadic iron concentrations without a discernible trend.

- The highest lead concentrations were detected in samples from CPS-9 (1,280 µg/L) and CPS-10A (567 µg/L) prior to regrading and capping of the waste rock and impacted soils. Elevated lead concentrations since the reclamation action have been prominent in samples collected from CPS-7A (ranging from 78 µg/L to 363 µg/L) and SRAD (ranging from 6 µg/L to 369 µg/L). Elevated concentrations were detected in 2011 samples from CPS-7A and 2008 samples from the SRAD. Lead trends for CPS-10A, CPS-7A, NRAD, and SRAD are shown on Figure F-7 in Appendix F. Similar to iron, these trends show sporadic lead concentrations without a discernible trend.

- The highest manganese concentrations were detected in samples from CPS-10A (24,900 µg/L and 70,600 µg/L), CPS-1 (10,770 µg/L to 30,900 µg/L), and CPS-7 (13,200 µg/L to 24,500 µg/L) prior to regrading and capping of the waste rock and impacted soils. Manganese trends for select seeps are shown on Figure F-8 in Appendix F. Manganese concentrations detected in samples have declined significantly since the reclamation action, but have remained elevated in samples from:

  - CPS-1 (2,510 µg/L to 10,530 µg/L)
  - CPS-10B (830 µg/L to 4,010 µg/L)
  - CPS-10A/DTRD (6,640 µg/L)
  - CPS-7A (560 µg/L to 1,460 µg/L)
  - CPSW-2 (19.3 µg/L to 1,390 µg/L)
  - North Drainage Runoff (70 µg/L to 2,780 µg/L)
  - NRAD (740 µg/L to 5,910 µg/L)

Samples from CPSW-1, which is located downslope from NRAD and SRAD, and upslope from CPSW-2 have contained manganese levels above DEQ RBCG standards, but substantially lower than concentrations in samples from these upslope and downslope areas.

- Zinc concentrations mirror manganese concentrations, with the highest concentrations detected in samples from CPS-10A (79,000 µg/L and 203,000 µg/L), CPS-1 (38,020 µg/L to 89,100 µg/L), and CPS-7 (38,500 µg/L to 75,300 µg/L) prior to regrading and capping of the waste rock and impacted soils. Zinc concentrations detected in samples

declined following the reclamation action, but have remained stable since 2007. Zinc trends for select seeps are shown on Figure F-9 in Appendix F. Zinc concentrations have remained elevated in samples collected from:

- CPS-1 (8,200 µg/L to 20,390 µg/L) (Figure F-1)
- CPS-10B (3,620 µg/L to 14,910 µg/L) (Figure F-5)
- CPS-10A/DTRD (20,400 µg/L)
- CPS-7A (4,650 µg/L to 8,400 µg/L)
- North Drainage Runoff (670 µg/L to 7,650 µg/L)
- NRAD (2,960 µg/L to 11,940 µg/L)
- SRAD (1,640 µg/L to 3,500 µg/L)

As with manganese concentrations, samples from CPSW-1 have contained zinc levels above DEQ RBCG standards, but substantially lower than concentrations in samples from upslope and downslope areas.

3.3.2.2 Groundwater

Dissolved metals analytical results for the nine samples and one duplicate sample collected from the nine Combination Mine groundwater monitoring wells are compared against Circular DEQ-7 HHS groundwater standards in Table 3-8. At least one metal exceeded Circular DEQ-7 standards in each of the samples. The highest metals concentrations were detected in samples from CMMW-3, located in the upper portion of the North Soils Removal Area; CMMW-5, located in the crest of the Combination Mine waste rock pile; and CMMW-7, located at the top of the North Soils Removal Area. The lowest concentrations were detected in CMMW-1, located in the upper portion of the South Soils Removal Area, and CMMW-6, located along the northern crest of the Combination Mine waste rock pile.

Review of the results in Table 3-8 does not reveal notable differences in metals concentrations, between wells screened in bedrock (CMMW-1, CMMW-3, CMMW-6, CMMW-7, and CMMW-8) and wells screened in soil (CMMW-2, CMMW-4, CMMW-5, and CMMW-9 [interface between bedrock and overburden]). Nor are there notable differences in samples collected from wells screened shallow compared to those screened deeper.

The following summarizes comparison of detected metals concentrations in groundwater samples to Circular DEQ-7 HHS groundwater standards (Table 3-8):

- Arsenic concentrations exceeded the HHS (10 µg/L) in the sample collected from CMMW-2 (108 µg/L), which is located in the crest of the Combination Mine waste rock pile. Concentrations in other samples did not exceed the HHS groundwater standards for arsenic.

- Cadmium exceeded the HHS (5 µg/L) in all groundwater samples, except the samples collected from CMMW-1 and CMMW-6. The highest cadmium concentrations were detected in samples collected from CMMW-7 (305 µg/L), CMMW-3 (170µg/L), CMMW-8 (155 µg/L), and CMMW-5 (152 µg/L).

- Copper exceeded the HHS (1,300 µg/L) in samples from CMMW-3 (12,100 µg/L), CMMW-4 (3,120 µg/L), CMMW-5 (7,100 µg/L), CMMW-7 (22,000 µg/L), and CMMW-8 (8,420 µg/L).

- Iron exceeded the HHS (300 µg/L) in samples collected from CMMW-1 (550 µg/L), CMMW-5 (988 µg/L), CMMW-6 (661 µg/L), and CMMW-7 (2,050 µg/L). Iron was the only metal detected above the HHS groundwater standards in samples from CMMW-1 and CMMW-6.

- Lead exceeded the HHS (15 µg/L) only in the sample collected from CMMW-5 (23.2 µg/L).

- Manganese exceeded the HHS (50 µg/L) in each of the samples, except for the samples collected from CMMW-1 and CMMW-6. The highest concentration was detected in sample collected from CMMW-7 (7,740 µg/L), followed by the samples from CMMW-8 (4,550 µg/L), CMMW-3 (4,280 µg/L), and CMMW-5 (4,040 µg/L).

- Zinc exceeded HHS (2,000 µg/L) in samples from CMMW-7 (22,300 µg/L), CMMW-3 (12,200 µg/L), CMMW-8 (12,300 µg/L), CMMW-5 (10,700 µg/L), and CMMW-4 (3,940 µg/L).

Historical dissolved metals concentrations are presented in Table 3-9 and groundwater levels detected since 2008 are tabulated in Table 3-10. Trend charts for both metals concentrations and fluid levels are provided in Appendix F. Metals concentrations do not exhibit notable trends in samples collected across the monitoring wells. Based on a limited number of sampling events, the 2011 RI data does not vary notably from historical data. Detected metals concentrations in groundwater samples are approximately an order of magnitude lower than concentrations detected in seep samples.

Monitoring wells CMMW-1, CMMW-2, CMMW-3, and CMMW-4 were installed in October 2001. However, only one set of samples was collected from CMMW-1, CMMW-3, and CMMW-4 (CMMW-2 was dry) prior to regrading and capping of the Combination Mine waste rock and impacted soils from the North and South Soils Removal Areas (Hydrometrics 2010). A second sample was collected from wells CMMW-1, CMMW-3, and CMMW-4 during regrading and capping of the waste rock pile (September 2006). Eight samples have been collected from

each of these wells, including CMMW-2, since grading and capping were completed. Metals concentrations in groundwater samples collected from CMMW-1 have decreased since reclamation of the waste rock pile. Metals concentrations detected in groundwater samples from CMMW-2, CMMW-3, and CMMW-4 have been sporadic, increasing or decreasing substantially between sampling events. Concentrations in samples collected from these wells do not appear to follow a trend.

Monitoring wells CMMW-5, CMMW-6, CMMW-7, CMMW-8, and CMMW-9 were installed during October 2008 (Hydrometrics 2010). Only four sampling events have been conducted for these monitoring wells, and two of these events were completed in May 2009. Additionally, significant differences exist between the detected metals concentration in samples collected on May 14, 2009 and those collected on May 29, 2009. Concentrations detected in groundwater collected from wells CMMW-5 through CMMW-9 varies substantially between sampling events. With the high variability in concentrations and the limited number of samples (four), a defined trend is not apparent.

The following summarizes comparison of detected metals concentrations in historical and RI groundwater samples (Table 3-9 and Figures F-10 through F-16 in Appendix F):

- The highest arsenic concentrations have been detected in CMMW-2, ranging from 108 µg/L (2011) to 252 µg/L (2008). The arsenic concentration detected in the May 2011 sample was the lowest level detected to date in samples from this well. The detected arsenic levels in groundwater samples from this well have been as much as 100 times higher than arsenic levels detected in groundwater samples from the other wells. CMMW-2 was constructed such that there is a 13-foot sump below the bottom of the screened interval (Figure F-18). Collection of sediments and stagnant groundwater in the sump may have an effect on the elevated arsenic levels. Arsenic has not been detected above Circular DEQ-7 HHS in samples from other wells. Arsenic concentrations for groundwater samples collected from each of the groundwater wells are shown on Figure F-10.

- Samples collected from CMMW-7 have consistently exhibited the highest cadmium concentrations, ranging from 289 µg/L (2009) to 393 µg/L (2010). Elevated cadmium concentrations have also been detected in samples from CMMW-3 (as high as 290.6 µg/L), CMMW-4 (as high as 156.6 µg/L), CMMW-8 (as high as 155 µg/L), and CMMW-5 (as high as 152 µg/L). Cadmium concentrations have remained stable in groundwater samples collected from the wells. Cadmium concentrations for groundwater samples collected from each of the groundwater wells are shown on Figure F-11.

- The highest copper concentrations have been detected in CMMW-7 (as high as 28,400 µg/L) and CMMW-3 (as high as 24,900 µg/L). Elevated copper concentrations have also been detected in samples from CMMW-4 (as high as 11,920 µg/L), CMMW-8 (as high as 8,420 µg/L), and CMMW-5 (as high as 7,100 µg/L). Copper concentrations have varied over time, but do not show defined trends. Copper

concentrations for groundwater samples collected from each of the groundwater wells are shown on Figure F-12.

- The highest six iron concentrations are associated with samples from six different monitoring wells and four different sampling events. The highest concentration was detected in a sample collected from CMMW-5 (2,300 µg/L) in May 2009. Iron concentrations for groundwater samples collected from each of the groundwater wells are shown on Figure F-13.

- The highest lead concentrations have been detected in CMMW-2 (8.6 µg/L to 56 µg/L) and CMMW-5 (2.7 µg/L to 36 µg/L), both of which are located in the Combination Mine waste rock pile. Samples collected from other wells have not exceeded the Circular DEQ-7 HHS lead standard. Lead concentrations for groundwater samples collected from each of the groundwater wells are shown on Figure F-14.

- The highest manganese concentrations have been detected in samples from CMMW-7 (7,740 µg/L to 9,520 µg/L) and CMMW-3 (1,650 µg/L to 8,680 µg/L). Manganese concentrations have also historically exceeded Circular DEQ-7 HHS standards in samples from the other monitoring wells, with the exception of CMMW-1 and CMMW-6. Similar to other metals detected in groundwater samples, manganese has not exhibited a definable trend over the groundwater sampling events. Manganese concentrations for groundwater samples collected from each of the groundwater wells are shown on Figure F-15.

- Zinc concentrations mirror manganese concentrations, with the highest concentrations detected in samples from CMMW-7 (20,500 µg/L to 27,100 µg/L) and CMMW-3 (3,810 µg/L to 24,800 µg/L). Zinc concentrations have also historically exceeded Circular DEQ-7 HHS standards in samples collected from CMMW-4 (1,320 µg/L to 13,690 µg/L), CMMW-5 (1,920 µg/L to 10,700 µg/L), and CMMW-8 (180 µg/L to 12,300 µg/L). Zinc concentrations for groundwater samples collected from each of the groundwater wells are shown on Figure F-16.

Fluid levels detected in the groundwater monitoring wells and the mine pool since March 2008 are provided in Table 3-10. A groundwater level trend chart is provided for each well and the mine pool in Appendix F (Figures F-17 through F-26). Groundwater elevations measured in each well are plotted with the mine pool elevation on Figure F-27. Fluid levels detected during the 2011 RI (May 5, 2011) were consistent with historical measurements during spring snowmelt. Groundwater levels in CMMW-1 (Figure F-17) have been increasing gradually since 2008; rising from 6006.44 ft in April 2008 to 6016.19 ft in November 2011. Groundwater levels in wells CMMW-2 (Figure F-18) through CMMW-7 (Figure F-23) have remained consistent over time, with groundwater levels varying seasonally. Groundwater levels in these wells increase sharply in response to spring snowmelt. Monitoring well CMMW-8 (Figure F-24) has shown some influences due to spring snowmelt, and has also shown an increasing groundwater level over time, rising from 5989.29 ft in April 2009 to 6013.69 ft in November 2011. Groundwater

levels in CMMW-9 (Figure F-25) have shown little seasonal variation and have remained constant over time. The mine pool elevation has risen over time (6061 ft in April 2008 to 6098 ft in November 2011) with substantial elevation increases in 2008 and 2011 (Figure F-26). As shown on Figure F-27, only the wells installed in the top of the waste rock pile (CMMW-2, CMMW-5, and CMMW-6) have groundwater levels above the elevation of the mine pool.

Water levels in CMMW-9 are minimal. This well does not appear to intersect groundwater flow, either deep or shallow. Monitoring wells CMMW-5 and CMMW-7 appear to only capture groundwater in response to spring snowmelt (shallow groundwater flow) and contain only minimal groundwater the remainder of the year.

As evident through review of the fluid level table and trend charts, the data contains some erroneous fluid level measurements. Wells CMMW-2, CMMW-4, CMMW-5, and CMMW-9, each contain fluid level measurements greater than the total depth of the well, represented by measurements below the total depth on the trend charts. These errors are obvious and do not impact the ability to interpret the longer term trends.

3.3.3 Hazardous Materials Inventory Sampling Results

Three buildings, one structure that houses a generator, and two adits were identified as physical hazards at the Combination Mine AOC. The auxiliary adit has been boarded up but the top of the portal has caved in. A temporary fix has been installed by drilling plywood onto 2”x4” timber spanning the opening. The main adit has been boarded up, but still provides access to the adit via a locked door. The Northern building and Southern building doors and windows have been boarded up, while the Central Processing building is not boarded up due to the large opening on the side of the building. A runoff collection pond is located downstream of the Combination Mine waste rock pile. The collection pond is fenced off with two fences. The outer fence was installed after the inner, barb wire fence, fell into disrepair. The outer fence keeps animals out of the pond and limits access to people, while also providing access to a pump that pumps water out of the runoff collection pond and into the auxiliary adit.

3.3.3.1 Suspect Asbestos-Containing Materials

A total of 30 samples were collected from 12 unique, suspect building materials identified in the Northern building, Central Processing building, and Southern building located at the Combination Mine AOC (Figure 2-1). Asbestos was not detected in the 30 samples (Appendix A) collected from the 12 suspect materials identified in the three metal shop buildings at the Combination Mine AOC.

3.3.3.2 Other Hazardous Building Materials

The three metal shop buildings at the Combination Mine AOC were also inspected for cooling systems with potential CFCs, and for fluorescent and HID light fixtures. No CFC-based cooling systems were observed, although six refrigerators were found at the Combination Mine AOC. These refrigerators were removed in combination with boarding site windows in late fall 2011.

A total of 151 fluorescent light and HID light fixtures and 245 ballasts were identified at the Combination Mine AOC (Table 3-11). Ballasts and light tubes should be collected from buildings if they are to be demolished and sent to a certified recycling/disposal facility.

Table 3-11. Summary of Fluorescent and HID Lights at Combination Mine AOC

Location	4-foot, 4-bulb	8-foot, 2-bulb	HID
Northern building	12	16	15
Central Processing building	0	0	0
Southern building	100	5	3
Total fixtures	112	21	18
Total ballasts	224	21	0

One large transformer (7 feet by 5 feet by 5 feet) was identified in the Central Processing building. The transformer was not in use and was stored near the west end of the building. The transformer was marked as having dielectric fluid containing less than 50 parts per million (ppm) PCBs and is not regulated under the Toxic Substance Control Act (TSCA).

Other potential hazardous materials or items identified at the Combination Mine AOC that require recycling, management, and/or disposal include:

- Two one-gallon containers of Antifreeze
- One one-gallon containers of engine oil
- Empty motor oil containers (quart and gallon size)
- One 55-gallon drum marked “calcium pellets”
- Two 55-gallon metal drums with unknown fluid (possibly used oil)
- Six refrigerators – (were removed and disposed of on 12/12/11)
- Three vehicles
- Two metals cans with unknown fluid (possibly fuel or solvent)
- One five-gallon bucket of grout
- Four automobile tires – (were removed and disposed of on 12/12/11)
- One one-gallon container of brake fluid

- Paint spray cans
- ABC fire extinguisher
- Two pressurized gas containers
- Two two-gallon Safety Can containers with unknown product
- Seven five-gallon bucket of unknown product (possibly motor oil)
- Two ABC dry chemical extinguishers
- Approximately 350 boxes of rock core samples
- Three, empty 500-gallon metal aboveground storage tanks (ASTs)
- One, empty 200-gallon metal AST

3.3.3.3 Soil Materials

Three soil samples (CMN-SS-17, CMN-SS-18, AND CMN-SS-19) were collected from soils stockpiled inside the Central Processing building (Figure 2-1) at the Combination Mine AOC. The analytical metals results for these samples are tabulated and compared to DEQ RBCG in Table 3-2.

Arsenic was the only metal that was detected in each of the samples (CMN-SS-17 – 14.5 mg/kg, CMN-SS-18 – 9.1 mg/kg, and CMN-SS-19 – 537 mg/kg) above the DEQ RBCG (0.7 mg/kg). The sample collected at location CMN-SS-19 also exceeded DEQ RBCG for:

- Antimony (1,010 mg/kg compared to 293 mg/kg)
- Cadmium (67 mg/kg compared to 19.5 mg/kg)
- Copper (56,800 mg/kg compared to 27,100 mg/kg)
- Lead (1,860 mg/kg compared to 1,100 mg/kg)
- Manganese (989 mg/kg compared to 665 mg/kg)

The detected antimony, arsenic, cadmium, and copper concentrations detected in the sample from CMN-SS-19 were higher than in soil or waste rock samples collected from other locations at the Combination Mine AOC. The lead concentration detected was the sixth highest, while the manganese concentration was the second highest concentration detected at the Combination Mine AOC.

3.4 Tim Smith Mine AOC

3.4.1 Solid-Matrix Sampling Results

Three waste rock, five soil samples, and three sediment samples were collected from the Tim Smith Mine AOC and analyzed for total recoverable metals and moisture content. Acid base accounting analysis was performed on the three waste rock samples. The complete analytical results for solid-matrix samples collected at the Tim Smith Mine AOC are presented in Appendix B-4; the laboratory reports are provided in Appendix C.

Total recoverable metals analytical results for the waste rock, soil, and sediment samples are compared against DEQ RBCG standards in Table 3-12 and discussed in Sections 3.4.1.1 and 3.3.4.2. The highest metals concentrations were detected in samples collected from the Tim Smith No. 1 Adit waste rock dump. Metals concentrations were substantially lower in soil samples collected below waste rock as compared to samples from the waste rock. Each of the sediment samples contained elevated manganese concentrations (ranging from 947 mg/kg to 1,150 mg/kg). Of the three sediment samples collected, the highest metals concentrations were detected in the upstream sample (TS-SD-01), which was the closest sediment sample to the Tim Smith No. 1 Adit waste rock dump.

Prior to this RI, solid-matrix sampling at the Tim Smith Mine AOC had been limited to four composite waste rock samples obtained from the Tim Smith No. 1 Adit waste rock dump (Hydrometrics 2010). Table 3-13 was developed to provide comparisons between historical analytical data and analytical data collected during this RI. Average concentrations have been calculated for each sampling event by area (e.g., 2001 waste rock samples, 2011 RI waste rock samples, 2011 RI soil samples, 2011 RI sediment samples), and both the average and individual sample metals concentrations are compared to DEQ RBCG. Comparisons between current RI data and historical data are also discussed below in Sections 3.4.1.1 and 3.4.1.2. Historical sample locations are shown on Figure 3-4 in Appendix E.

ABA results are tabulated in Table 3-14 and discussed in Section 3.4.1.4.

3.4.1.1 Waste Rock

Three waste rock samples were collected from three test pits (TS-RS-01, TS-RS-03, and TS-RS-07). Metals concentrations were notably higher in the two waste rock samples collected from the Tim Smith No. 1 Adit waste rock dump as compared to metals concentrations in the one sample collected from the Tim Smith No. 2 Adit waste rock dump. Detected concentrations for antimony, arsenic, copper, lead, mercury, iron, and silver were significantly higher in these samples than concentrations detected in underlying soils samples. The concentrations of antimony and arsenic were also higher in the waste rock sample collected at TS-RS-07 than in the overlying soil sample (TS-SS-07). However, other metals concentrations were similar in the overlying soil sample from this location.

Detected metals concentrations in waste rock samples collected at the Tim Smith Mine AOC were lower than metals concentrations in waste rock samples from the Combination Mine AOC. Average antimony (479.7 mg/kg compared to 713.3 mg/kg), cadmium (3.34 mg/kg compared to 10.63 mg/kg), copper (778.4 mg/kg compared to 1,103 mg/kg), lead (1,701 mg/kg compared to 2,883 mg/kg), manganese (146.9 mg/kg compared to 412.2 mg/kg), and zinc (103.9 mg/kg compared to 884 mg/kg) concentrations were each lower at the Tim Smith Mine AOC. Average arsenic (538.3 mg/kg compared to 409.3 mg/kg), mercury (1.8 mg/kg compared to 0.235 mg/kg), and nickel (2.9 mg/kg compared to 2.73 mg/kg) concentrations were higher at the Tim Smith Mine AOC. The lower average metals concentrations calculated for waste rock from the Tim Smith Mine AOC is due to low concentrations detected in the sample from the Tim Smith No. 2 Adit waste rock dump. When comparing only the waste rock samples collected from the Tim Smith Mine No. 1 Adit, the average metals concentrations are similar to the average concentrations for the Combination Mine waste rock, except for manganese (186.5 mg/kg compared to 412.2 mg/kg), mercury (2.2 mg/kg compared to 0.235 mg/kg), and zinc (146.5 mg/kg compared to 884.0 mg/kg).

The following summarizes comparison of detected metals concentrations in waste rock samples collected at the Tim Smith Mine AOC to DEQ RBCG (Table 3-12):

- Antimony exceeded the DEQ RBCG (293 mg/kg) in the waste rock samples collected from TS-RS-01 (508 mg/kg) and TS-RS-03 (712 mg/kg).

- Arsenic exceeded the 95th UCL (40.4 mg/kg) in each of the waste rock samples, ranging from 118 mg/kg in the sample collected from TS-RS-07 to 868 mg/kg in the sample collected from TS-RS-03.

- Lead exceeded the DEQ RBCG (1,100 mg/kg) in the waste rock samples collected from TS-RS-01 (1,880 mg/kg) and TS-RS-03 (3,060 mg/kg).

- Detected concentrations did not exceed the DEQ RBCG for other metals analyzed, although copper (1,510 mg/kg and 794 mg/kg) and zinc (149 mg/kg and 144 mg/kg) were elevated in samples from TS-RS-01 and TS-RS-03 as compared to average background concentrations (51.9 mg/kg and 69.7 mg/kg, respectively).

Waste rock at the Tim Smith No. 1 Adit waste rock dump was sampled in July 2001. No historical sample data exists for the Tim Smith No. 2 Adit waste rock dump. The following summarizes comparison of detected metals concentrations in historical and RI samples (Table 3-13). Historical sample locations are shown on Figure 3-4 in Appendix E.

- Antimony, mercury, and nickel were not analyzed in historical waste rock samples.

- Except for nickel, the detected metals concentrations in the sample from the Tim Smith No. 2 Adit waste rock dump were substantially lower than detected metals concentrations in both 2001 and 2011 samples collected from the Tim Smith No. 1 Adit waste rock dump.

- The average arsenic concentration calculated for 2001 waste rock samples (532.0 mg/kg) is similar to the average concentration calculated for RI waste rock samples (538.3 mg/kg). The highest concentration was detected in the sample collected at TS-RS-03 (868 mg/kg).

- The average cadmium concentration calculated for 2001 waste rock samples (8.25 mg/kg) is slightly higher than the average concentration calculated for RI waste rock samples (3.34 mg/kg). The highest concentration was detected in the sample collected in 2001 from the Tim Smith Pad East Composite (13 mg/kg).

- The average copper concentration calculated for 2001 waste rock samples (1,165 mg/kg) is higher than the average concentration calculated for RI waste rock samples (778.4 mg/kg). The highest concentration was detected in the sample collected in 2001 from the Tim Smith Pad West Trench (1,740 mg/kg).

- The average lead concentration calculated for 2001 waste rock samples (2,280 mg/kg) was slightly higher than the average concentration calculated for RI waste rock samples (1,701 mg/kg). The highest concentration was detected in the sample collected in 2001 from the Tim Smith Pad East Composite (3,140 mg/kg).

- The average manganese concentration calculated for 2001 waste rock samples (227.8 mg/kg) was slightly higher than the average concentration calculated for RI waste rock samples (146.9 mg/kg). The highest concentration was detected in the sample collected in 2001 from the Tim Smith Pad East Trench (390 mg/kg).

- The average zinc concentration calculated for 2001 waste rock samples (123.5 mg/kg) was slightly higher than the average concentration calculated for RI waste rock samples (103.9 mg/kg). The highest concentration was detected in the sample collected in 2001 from the Tim Smith Pad West Trench (155 mg/kg).

Both the range of and average metals concentrations are similar between waste rock samples collected in 2001 and waste rock samples collected during the 2011 RI. The chemistry of the waste rock does not appear to have changed notably from 2001 to 2011.

3.4.1.2 Soil

Five soil samples were collected from five test pits at the Tim Smith Mine AOC. Three test pits were excavated in the Tim Smith No. 1 Adit waste rock dump and two were excavated in the Tim Smith No. 2 Adit waste rock dump. Surface soil samples were collected from TS-SS-07 and TS-SS-08, and subsurface soil samples were collected from TS-SS-01, TS-SS-02, and TS-SS-03. Metals concentrations in the samples collected from surface soils and soils underlying the waste rock were below DEQ RBCG; however, arsenic did exceed the 95th UCL in samples collected from TS-SS_02, TS-SS-07, and TS-SS-08.

The following summarizes comparison of detected metals concentrations in soil samples to DEQ RBCG (Table 3-12):

- Antimony concentrations did not exceed DEQ RBCG (293 mg/kg) in the soil samples collected at the Tim Smith Mine AOC. However, elevated concentrations were detected in the samples from TS-SS-02 (109 mg/kg) and TS-SS-07 (64.2 mg/kg).

- Arsenic concentrations exceeded 95th UCL (40.4 mg/kg) in three of the five soil samples, with the highest concentrations detected in samples from TS-SS-02 (79.8 mg/kg), TS-SS-07 (73.6 mg/kg), and TS-SS_08 (47.4 mg/kg).

- Copper concentrations did not exceed DEQ RBCG (27,100 mg/kg) in the soil samples. However, elevated concentrations were detected in the samples from TS-SS-02 (189 mg/kg) and TS-SS-03 (730 mg/kg).

- Lead concentrations did not exceed DEQ RBCG (1,100 mg/kg) in the soil samples. However, elevated concentrations were detected in the samples from TS-SS-02 (328 mg/kg), TS-SS-07 (200 mg/kg), and TS-SS-08 (147 mg/kg).

- Manganese concentrations did not exceed DEQ RBCG (665 mg/kg) in the soil samples. However, elevated concentrations were detected in the each of the samples ranging from 109 mg/kg (TS-SS-08) to 660 mg/kg (TS-SS-01).

- Cadmium, mercury, nickel, and zinc concentrations were not elevated in the soil samples and did not exceed DEQ RBCG.

Soil samples had not previously been collected at the Tim Smith Mine AOC.

3.4.1.3 Sediment

Three sediment samples were collected at the Tim Smith Mine AOC downstream from the Tim Smith No. 1 Adit waste rock dump. Sediment samples were collected from surface sediments (0 to 6 inches) in the Tim Smith drainage. Metals concentrations detected in the sediment samples were approximately an order of magnitude lower than detected concentrations in waste rock samples, except for manganese, mercury, nickel, and zinc. Elevated concentrations of manganese, mercury, nickel, and zinc were detected in the sediment samples, although only manganese exceeded the DEQ RBCG. With the exception of manganese, mercury, and nickel, concentrations decreased downstream.

The following summarizes comparison of detected metals concentrations in sediment samples to DEQ RBCG (Table 3-12):

- Antimony concentrations did not exceed DEQ RBCG (293 mg/kg) in the sediment samples collected at the Tim Smith Mine AOC. The highest concentration was detected in s the sample from TS-SD-01 (37.2 mg/kg).

- Arsenic concentrations did not exceed the 95th UCL (40.4 mg/kg) in the sediment samples. Arsenic concentrations ranged from 20.2 mg/kg (TS-SD-03) to 31.1 mg/kg (TS-SD-01).

- Cadmium concentrations did not exceed DEQ RBCG (19.5 mg/kg) in the sediment samples. Concentrations ranged from 1.1 mg/kg (TS-SD-02) to 9.1 mg/kg (TS-SD-01).

- Copper concentrations did not exceed DEQ RBCG (27,100 mg/kg) in the sediment samples. Concentrations ranged from 50.9 mg/kg (TS-SD-02) to 639 mg/kg (TS-SD-01).

- Lead concentrations did not exceed DEQ RBCG (1,100 mg/kg) in the sediment samples. Concentrations ranged from 39.2 mg/kg (TS-SD-03) to 110 mg/kg (TS-SD-01).

- Manganese concentrations exceeded DEQ RBCG (665 mg/kg) in each of the sediment samples. Manganese concentrations ranged from 947 mg/kg (TS-SD-02) to 1,150 mg/kg (TS-SD-03). The detected manganese concentrations in the sediment samples exceeded concentrations detected in upstream waste rock and soil samples.

- Mercury concentrations did not exceed DEQ RBCG (220 mg/kg) in the sediment samples. However, mercury was detected at 24.4 mg/kg in the sample from TS-SD-02, which is an order of magnitude higher than detections in other waste rock, soil, and sediment samples from the Tim Smith Mine AOC.

- Nickel concentrations did not exceed DEQ RBCG (14,650 mg/kg) in the sediment samples. However, elevated concentrations were detected in the each of the samples ranging from 20 mg/kg (TS-SD-02) to 31.2 mg/kg (TS-SD-03).

- Zinc concentrations did not exceed DEQ RBCG (220,000 mg/kg) in the sediment samples. However, elevated concentrations were detected in the each of the samples ranging from 117 mg/kg (TS-SD-02) to 236 mg/kg (TS-SD-01).

Sediment samples had not previously been collected at the Tim Smith Mine AOC.

3.4.1.4 Acid Base Accounting

The three waste rock samples from the Tim Smith AOC were analyzed for ABA. The results from the ABA analyses are tabulated in Table 3-14 and are summarized below:

- Sulfur levels in the samples ranged from 0.092% to 0.16%

- The acid potential was calculated at <4.3 t/kt

- Neutralization potential ranged from <0.5 t/kt to 0.72 t/kt
- The lime requirement was calculated at <5.4 t/kt
- Acid base potential or net neutralization potential ranged from 0 t/kt to 0.7 t/kt

The acid base potential or net neutralization potential falls within the -20 t/kt to +20 t/kt, which is considered to have uncertainty and the potential to generate acid exists (EPA 1994a). Lime amendments, if necessary, are low and would require a maximum of 5.4 tons of lime for every 1000 tons of waste.

3.4.2 Water-Matrix Sampling Results

Five surface water samples were collected from springs and drainages at the Tim Smith Mine AOC. Field parameters were collected for each water sample and the samples were submitted to Pace Analytical for analysis of total recoverable metals and laboratory parameters. The complete analytical results, including field and laboratory parameters, for water-matrix samples collected at the Tim Smith Mine AOC are presented in Appendix B-5; the laboratory reports are provided in Appendix C. Total recoverable metals analytical results are presented in Tables 3-15 (DEQ RBCG) and 3-16 (Circular DEQ-7).

Table 3-17 was developed to provide comparisons between historical analytical data and analytical data collected during this RI. This table includes metals concentrations detected in samples collected from springs and the Tim Smith drainage since October 2000. The table also includes one, 1981 baseline monitoring sample (013) that corresponds to the 2011 RI sample location TSP-6. Comparisons between current RI data and historical data are also discussed below. Historical sample locations are shown on Figure 3-4 in Appendix E.

The detected metals concentrations in surface water samples collected at the Tim Smith Mine AOC were significantly (one to two orders of magnitude) lower than concentrations in surface water/seep samples collected at the Combination Mine AOC. Metals concentration did not vary significantly from upstream to downstream locations and there was not one sample that had significantly higher concentrations than other samples. Copper concentrations increased moving downstream; 8.9 µg/L at TSP-9 compared to 22.5 µg/L at TSP-6. Conversely, manganese concentrations were higher in upstream samples (18.8 µg/L in TSP-9 and 52.6 µg/L in TSP-10) than in downstream samples (8.9 µg/L in TSP-6). Metals concentrations detected in the sample collected from TSP-10 (the spring house), which is located upgradient form the Tim Smith Adit No. 1, were higher than downstream samples for arsenic, iron, lead, and manganese.

The following summarizes comparison of detected metals concentrations in surface water/spring samples to DEQ RBCG (Table 3-15):

- Arsenic exceeded the DEQ RBCG (0.06 µg/L) in each of the surface water samples. Arsenic concentrations ranged from 1.1 µg/L in the sample collected from TSP-6 to 2.00 µg/L in the sample collected from TSP-10.

- Manganese exceeded the DEQ RBCG (16.6 µg/L) in the samples collected from TSP-9 (18.8 µg/L) and TSP-10 (52.6 µg/L). Detected concentrations in the other samples ranged from 8.9 µg/L (TSP-6) to 13.6 µg/L (TSP-8).

- Zinc exceeded the DEQ RBCG (17.2 µg/L) in the samples collected from TSP-8 (22.3 µg/L) and TSP-9 (19.0 µg/L). Detected concentrations in the other samples ranged from 8.2 µg/L (TSP-6) to 17.1 µg/L (TSP-10).

- Detected concentrations did not exceed the DEQ RBCG for other metals analyzed.

The following summarizes comparison of detected metals concentrations in surface water samples to Circular DEQ-7 standards (Table 3-16):

- Cadmium exceeded the CALS (0.097 µg/L) in TSP-3 (0.14µg/L), TSP-8 (0.28 µg/L) and TSP-9 (0.25 µg/L). Cadmium concentrations did not exceed the HHS (5 µg/L) or AALS (0.52 µg/L) standards.

- Copper exceeded both the AALS (3.79 µg/L) and CALS (2.85 µg/L) in each of the five samples, ranging from 6.3 µg/L (TSP-10) to 30.5 (TSP-3). Copper did not exceed the HHS (1,300 µg/L).

- Iron exceeded both the HHS (300 µg/L) and the CALS (1,000 µg/L) in each of the surface water samples, ranging from 1,000 µg/L (TSP-6) to 2,990 µg/L (TSP-10). AALS are not available for iron.

- Lead exceeded the CALS (0.545 µg/L) in each of the samples, ranging from 0.86 µg/L (TSP-3) to 2.7 µg/L (TSP-10). Lead did not exceed the HHS (15 µg/L) or AALS (13.98 µg/L).

- Manganese exceeded the HHS (50 µg/L) in the sample collected from TSP-10 (52.6 µg/L). Concentrations in other samples ranged from 8.9 µg/L (TSP-6) to 18.8 µg/L (TSP-9). Manganese standards are not available for AALS or CALS.

- Silver was not detected in samples from TSP-3, TSP-6, TSP-8, and TSP-9. However, the reporting limit (0.5 µg/L) was higher than the AALS (0.374 µg/L). Silver did not exceed the HHS (100 µg/L). A standard is not available for the CALS.

- Detected concentrations did not exceed the HHS, AALS, or CALS for other metals analyzed.

Discharge rates for each surface water sample location are also tabulated in Tables 3-15 and 3-16. Discharge rates measured at the Tim Smith Mine AOC ranged from 0.01 to 4.50 cfs. Low discharge rates were observed at the upstream locations, TSP-9 and TSP-10 (0.51 and 0.01 cfs, respectively). Tim Smith drainage discharge rates increased at the downstream locations, with

the highest flow rate observed near the confluence with South Fork Lower Willow Creek at TSP-6 (4.50 cfs).

Historical metals concentrations (analyzed as dissolved, total, or total recoverable metals) are presented in Table 3-17. As discussed for the Combination Mine AOC, dissolved and total metals results are typically not compared due to the different procedures involved. However, results from these two different methods are compared in Table 3-17 to allow for a qualitative assessment of metals trends. Trends in the data are difficult to discern due to the low number of sampling events, difference in analytical procedures, and the high number of non-detect results with high reporting limits (e.g., non-detects at a reporting limit of 50 µg/L for antimony). With the exception of iron, which appears to have increased substantially in the samples collected in 2011 at each location, metals concentrations appear to have remained stable over time. The longest data record exists for TSP-9, located adjacent to the southeast corner of the Tim Smith No. 1 Adit waste rock dump. Trends for copper, iron, manganese, and zinc in samples from this location are shown on Figure F-28 in Appendix F.

The following summarizes comparison of detected metals concentrations in historical and RI samples (Table 3-17). Historical sample locations, beyond those sampled during the RI, are shown on Figure 3-4 in Appendix E.

- Antimony, arsenic, lead, and silver have either been reported as non-detects or not analyzed for during previous sampling events.

- The highest cadmium concentrations were detected in samples from TSP-1 in 2001 (2.6 µg/L) and TSP-9 in 2009 (2.1 µg/L). Other detected concentrations have ranged from 0.08 µg/L (TSP-10, 2011) to 0.6 µg/L (TSP-9, 2001). Cadmium concentrations do not exhibit discernable trends over the sampling events.

- The highest copper concentrations were detected in samples from TSP-3 in 2011 (30.5 µg/L), TSP-6 in 2011 (22.5 µg/L), and TSP-8 in 2011 (24.2 µg/L). The highest copper concentrations have typically been detected in samples from TSP-8.

- Iron concentrations detected in samples collected during 2011 were one order of magnitude higher than previous sample results, except for the 2009 sample collected from TSP-9 (2,760 µg/L). The highest iron concentrations were detected in TSP-10 (2,990 µg/L), TSP-9 (2,780 µg/L), TSP-8 (2,130 µg/L), TSP-3 (1,180 µg/L), and TSP-6 (1,000 µg/L) during 2011.

- Manganese historically has been reported as non-detect in samples collected from TSP-1 and TSP-6. The highest manganese concentration was detected in the sample from TSP-9 (270 µg/L) in 2001. Excluding non-detect results and the elevated result in the TSP-9 sample, concentrations have ranged from 8.9 µg/L (TSP-6) to 70 µg/L (TSP-9).

- Zinc concentrations have remained stable across sampling events, ranging from a low of 8.2 µg/L at TSP-6 in 2011 to highs of 40 µg/L in samples collected from TSP-8 and TSP-10 in 2001.

3.4.3 Hazardous Materials Inventory Sampling Results

Two buildings, one structure, and two adits were identified as physical hazards in the Tim Smith AOC (Figures 2-3 and 2-4). The two buildings are located at the Tim Smith No. 1 Adit and are locked with a padlock. The spring house is located on the road between Tim Smith No. 1 and No. 2 adits, and can be accessed through a side door. The Tim Smith No. 1 and No. 2 Adits are boarded up.

3.4.3.1 Suspect Asbestos-Containing Materials

A total of three samples were collected from two unique suspect building materials identified on the Tim Smith No. 1 Adit north building (HM-ASB-45) and the spring house (HM-ASB-43 and HM-ASB-44) adjacent to the Tim Smith No. 1 Adit access road (Figure 2-4). Asbestos was not detected in the three samples collected from suspect materials identified in the Tim Smith Mine AOC.

3.4.3.2 Other Hazardous Building Materials

Two buildings and one structure at the Tim Smith No. 1 Adit were inspected for cooling systems with potential CFCs. No CFC based cooling systems were observed.

One fluorescent light fixture and two ballasts were identified in the Tim Smith Mine AOC in the Tim Smith No. 1 Adit south building. No other fluorescent fixtures were identified in the buildings/structures. No HID lights were observed. Ballasts and light tubes should be collected from buildings if they are to be demolished and sent to a certified recycling/disposal facility.

Table 3-18. Summary of Fluorescent and HID Lights at Tim Smith Mine AOC

Location	4-foot, 4-bulb	8-foot, 2-bulb	HID
South building	0	1	0
Total fixtures	0	1	0
Total ballasts	0	2	0

Other potentially hazardous materials or items identified at the Tim Smith Mine AOC that require recycling, management, and/or disposal include:

- Two one-quart containers of transmission fluid
- Tubing covered with oily product
- Two, empty gasoline tanks (five-gallon and 10-gallon)

- One 55-gallon drum (unknown content)
- One, empty fuel AST
- Large fan/blower
- Two discharged fire extinguishers

3.5 Historic Mine AOC

3.5.1 Solid-Matrix Sampling Results

Twelve waste rock, eleven soil samples, and one sediment sample were collected from the Historic Mine AOC and analyzed for total recoverable metals and moisture content. Sample locations are shown on Figures 2-5. Acid base accounting analysis was performed on eight of the twelve waste rock samples and on the eight surface soil samples. Two samples were also collected and submitted for geotechnical analysis. These samples are discussed in Section 7, Repository Site Investigation. The complete analytical results for solid-matrix samples collected at the Historic Mine AOC are presented in Appendix B-6; the laboratory reports are provided in Appendix C.

Total recoverable metals analytical results for waste rock, soils, and sediments are compared against DEQ RBCG standards in Table 3-19 and discussed in Sections 3.5.1.1, 3.5.1.2, and 3.5.1.3. Elevated metals concentrations were detected in waste rock samples and appear to be higher in samples (HM-RS-06 and HM-RS-07) associated with test pits excavated in the downslope edge of the Harper shaft waste rock area. Metals concentrations decreased with depth for those locations where samples were collected at multiple depths. Prior to this RI, soil sampling in the Historic Mine AOC was limited to geotechnical/agricultural sampling associated with potential soil borrow areas. Environmental characterization sampling had not been completed.

ABA results are tabulated in Table 3-20 and discussed in Section 3.5.1.4.

3.5.1.1 Waste Rock

Twelve waste rock samples were collected from eight test pits. Four test pits (HM-RS-01 through HM-RS-04) were located downgradient from the Harrison Shaft; three test pits (HM-RS-05 through HM-RS-07) were located downgradient from the Harper Shaft; and one test pit was located northwest of the Lewis Shaft (HM-RS-08). Metals concentrations were similar between samples collected from test pits excavated downgradient of the Harper and Harrison shafts, though metals in samples from HM-RS-06 and HM-RS-07 (Harper Shaft) were slightly higher than other samples. Metals concentrations in the sample collected from the test pit near the Lewis Shaft were lower than for waste rock samples collected from the Harper and Harrison shaft areas. Metals concentrations decreased with sample depth.

The following summarizes comparison of detected metals concentrations in waste rock samples collected at the Historic Mine AOC to DEQ RBCG (Table 3-19):

- Antimony exceeded the DEQ RBCG (293 mg/kg) in the waste rock samples collected from the Harrison Shaft (1 to 3 feet bgs at HM-RS-02 [421 mg/kg] and HM-RS-03 [1,140 mg/kg]), and the Harper Shaft (HM-RS-06 [1,020 mg/kg], and HM-RS-07 [1,380 mg/kg]). Antimony concentrations were roughly an order of magnitude higher than background soil concentrations and concentrations in soil samples collected from below the waste rock samples.

- Arsenic exceeded the 95th UCL (40.4 mg/kg) in eight of the 12 waste rock samples, ranging from 41.5 mg/kg in the sample collected from the Lewis Shaft (2 to 4 feet bgs at HM-RS-08) to 1,380 mg/kg in the sample collected from the Harper Shaft (1 to 3 feet bgs at HM-RS-07). The arsenic concentrations detected in the samples from the Harper Shaft (HM-RS-07 and HM-RS-06 [1,190 mg/kg]) were higher than concentrations detected in waste rock samples at either the Combination Mine AOC or the Tim Smith Mine AOC.

- Cadmium exceeded the DEQ RBCG (19.5 mg/kg) in the samples collected from the Harper Shaft (1 to 3 feet bgs at HM-RS-06 [22.8 mg/kg] and HM-RS-07 [20.6mg/kg]). Cadmium concentrations were not elevated in other waste rock samples.

- Lead exceeded the DEQ RBCG (1,100 mg/kg) in the waste rock samples collected from the Harrison Shaft (1 to 3 feet bgs at HM-RS-02 [1,820 mg/kg] and HM-RS-03 [2,800 mg/kg], and the Harper Shaft (1 to 3 feet bgs at HM-RS-06 [4,980 mg/k], and HM-RS-07 [6,960 mg/kg]). The lead concentration in the sample collected from 8 to 10 feet bgs at HM-RS-06 (1,500 mg/kg) also exceeded the DEQ RBCG.

- Manganese exceeded the DEQ RBCG (665 mg/kg) in the waste rock samples collected from the Harrison Shaft (1 to 3 feet bgs at HM-RS-02 [740 mg/kg]) and the Harper Shaft (1 to 3 feet bgs at HM-RS-06 [682 mg/kg]). Concentrations in other waste rock samples ranged from 119 mg/kg in the sample collected from 8 to 10 feet bgs at HM-RS-01 to 620 mg/kg in the sample collected from 3 to 5 feet bgs at HM-RS-03.

- Detected concentrations did not exceed the DEQ RBCG for other metals analyzed.

Detected metals concentrations in waste rock samples collected at the Historic Mine AOC were similar, but lower than metals concentrations in waste rock samples from the Tim Smith Mine AOC and the Combination Mine AOC:

- The average antimony concentration (357.4 mg/kg) detected in samples at the Historic Mine AOC was lower than the Tim Smith Mine AOC average (479.7 mg/kg) and the Combination Mine AOC average (713.3 mg/kg).

- The average arsenic concentration (353.6 mg/kg) detected in samples at the Historic Mine AOC was lower than the Tim Smith Mine AOC average (538.3 mg/kg) and the Combination Mine AOC average (409.3 mg/kg).

- The average cadmium concentration (5.89 mg/kg) detected in samples at the Historic Mine AOC was higher than the Tim Smith Mine AOC average (3.34 mg/kg), but lower than the Combination Mine AOC average (10.63 mg/kg).

- The average copper concentration (667.6 mg/kg) detected in samples at the Historic Mine AOC was lower than the Tim Smith Mine AOC average (778.4 mg/kg) and the Combination Mine AOC average (1,103 mg/kg).

- The average lead concentration (1,624 mg/kg) detected in samples at the Historic Mine AOC was lower than the Tim Smith Mine AOC average (1,701 mg/kg) and the Combination Mine AOC average (2,883 mg/kg).

- The average manganese concentration (392.8 mg/kg) detected in samples at the Historic Mine AOC was higher than the Tim Smith Mine AOC average (146.9 mg/kg), but lower than the Combination Mine AOC average (412.2 mg/kg).

- The average mercury concentration (1.13 mg/kg) detected in samples at the Historic Mine AOC was lower than the Tim Smith Mine AOC average (1.83 mg/kg), but higher than the Combination Mine AOC average (0.235 mg/kg).

- The average nickel concentration (10.18 mg/kg) detected in samples at the Historic Mine AOC was higher than the Tim Smith Mine AOC average (2.90 mg/kg) and the Combination Mine AOC average (2.73 mg/kg).

- The average zinc concentration (128 mg/kg) detected in samples at the Historic Mine AOC was higher than the Tim Smith Mine AOC average (103.9 mg/kg), but lower than the Combination Mine AOC average (884 mg/kg).

3.5.1.2 Soil

Three soil samples (HM-SS-03, HM-SS-04, and HM-SS-07) were collected from three test pits at the Historic Mine AOC. These samples were collected from below the waste rock material in the test pits. In addition, eight surface soil samples were collected downgradient from the Harrison Shaft (four samples), Harper Shaft (two samples), and Lewis Shaft (two samples). The lowest metals concentrations were detected in the subsurface soil samples at HM-SS-03 and HM-SS-04, and the surface soil samples collected along the northern fringe of the Harrison Shaft waste rock area (HM-SS-11 and HM-SS-12). The highest metals concentrations were detected in samples from HM-SS-13, located north (cross-gradient) of the Harper Shaft waste rock area, and HM-SS-15 and HM-SS-16, both located downgradient from the Lewis Shaft. Metals concentrations were similar in the other soil samples.

The following summarizes comparison of detected metals concentrations in soil samples to DEQ RBCG (Table 3-19):

- Antimony concentrations exceeded the DEQ RBCG (293 mg/kg) in samples collected from HM-SS-15 (594 mg/kg) and HM-SS-16 (1,160 mg/kg). Both of these samples were collected downgradient from the Lewis Shaft (Figure 2-5).

- Arsenic concentrations exceeded 95th UCL (40.4 mg/kg) in seven of the 11 soil samples, with the highest concentrations detected in samples from the Lewis Shaft (HM-SS-16 [1,140 mg/kg] and HM-SS-15 [501 mg/kg]), and the Harper Shaft (HM-SS-13 [316 mg/kg]). The arsenic concentration detected in the sample from HM-SS-16 was higher than the concentrations detected in all but two of the waste rock samples, and was higher than the arsenic concentrations detected in waste rock samples at the Combination Mine AOC and Tim Smith Mine AOC. This sample was collected in fill material (waste rock) east of the Lewis Shaft and is more representative of mine waste than surface soils.

- Lead concentrations exceeded the DEQ RBCG (1,100 mg/kg) in the soil samples collected at the Lewis Shaft (HM-SS-16 [4,900 mg/kg] and HM-SS-15 [2,050 mg/kg]), and the Harper Shaft (HM-SS-13 [2,210 mg/kg]). The lead concentration detected in the sample from 3 to 5 feet bgs at the Harper Shaft (HM-SS-07 [1,020 mg/kg]) was slightly below the DEQ RBCG.

- Manganese concentrations exceeded the DEQ RBCG (665 mg/kg) in soil samples collected from 3 to 5 feet bgs at the Harper Shaft (HM-SS-07 [2,320 mg/kg]), and from the surface sample collected from 0 to 0.5 feet bgs (HM-SS-13 [1,240 mg/kg]). Surface samples from the Harrison Shaft (HM-SS-09 [782 mg/kg] and HM-SS-10 [1,400 mg/kg]) also exceeded the DEQ RBCG.

- Detected concentrations did not exceed the DEQ RBCG for other metals analyzed.

Soil samples had not previously been sampled at the Historic Mine AOC.

3.5.1.3 Sediment

One sediment sample (HM-SD-01) was collected from the Mill Creek drainage downslope from the waste rock areas at the Historic Mine AOC. Metals concentrations detected in the sediment sample were similar to concentrations detected in upgradient soil samples. Concentrations were also similar to concentrations detected in sediment samples at the Tim Smith Mine AOC, with the exception of the copper, lead, manganese, and mercury concentrations, which were substantially higher than concentrations detected in Tim Smith Mine AOC sediment samples.

The following summarizes comparison of detected metals concentrations in the sediment sample to DEQ RBCG (Table 3-19):

- The copper concentration (2,780 mg/kg) did not exceed the DEQ RBCG, but was higher than concentrations detected in all but two other samples (HM-RS-06 and HM-RS-07 from the Harper Shaft) at the Historic Mine AOC.

- The manganese concentration (2,780 mg/kg) exceeded DEQ RBCG (665 mg/kg). This manganese concentration was the highest detected in solid-matrix samples at the Historic Mine AOC.

- The mercury concentration (27.4 mg/kg) did not exceed DEQ RBCG (220 mg/kg). However, this concentration is one to four orders of magnitude higher than other mercury detections at the Historic Mine AOC.

- Detected concentrations did not exceed the DEQ RBCG for other metals analyzed.

Sediment samples had not previously been sampled at the Tim Smith Mine AOC.

3.5.1.4 Acid Base Accounting

Sixteen samples, eight waste rock and eight surface soils, were collected at the Historic Mine AOC and analyzed for ABA. The results from the ABA analyses can be found in Table 3-20 and are summarized below:

- Sulfur levels in the samples ranged from <0.05% to 0.452%

- Acid potential ranged from <4.3 t/kt to 8.2 t/kt

- Neutralization potential ranged from <0.5 t/kt to 6 t/kt

- Lime requirements ranged from <5.4 t/kt to 16.9 t/kt

- Acid base potential or net neutralization potential ranged from -8.2 t/kt to 6 t/kt.

The acid base potential or net neutralization potential falls within the -20 t/kt to +20 t/kt, which is considered to have uncertainty and the potential to generate acid exists (EPA 1994a). Lime amendments, if necessary, are low and would require a maximum of 16.9 tons of lime for every 1,000 tons of waste. The results for HM-SS-16, located near the Lewis Shaft, indicated this material has the largest potential for generating acid.

3.5.2 Water-Matrix Sampling Results

Two surface water samples were collected at the Historic Mine AOC. One sample location coincided with the routine surface water monitoring location, MCSP-1. The second location was identified in the field during the sampling event and was located adjacent to the south side of the road from the Lewis Shaft to the Combination Mill. This sample location may collect surface runoff from the Tim Smith No. 2 Adit waste rock dump and from portions of the Lewis Shaft

area. Field parameters were collected for each water sample and the samples were submitted to Pace Analytical for analysis of total recoverable metals and laboratory parameters. The complete analytical results, including field and laboratory parameters, for water-matrix samples collected at the Historic Mine AOC are presented in Appendix B-7; the laboratory reports are provided in Appendix C. Total recoverable metals analytical results are presented in Tables 3-21 (DEQ RBCG) and 3-22 (Circular DEQ-7).

Table 3-23 was developed to provide comparisons between historical analytical data and analytical data collected during this RI. Samples have been collected from three locations in the Historic Mine AOC; BPM-Seep (once in 1998), MCSP-1 (five times from 2001 to 2011), and Road Cut (once in 2011). Comparisons between current RI data and historical data are also discussed below. Historical sample locations are shown on Figure 3-5 in Appendix E.

The detected metals concentrations in surface water samples collected at the Historic Mine AOC were similar, but lower than concentrations in surface water/seep samples collected at the Combination Mine AOC. With the exception of cadmium, copper, and zinc, higher metals concentrations were detected in the Road Cut sample than in the sample from routine surface water monitoring location MCSP-1.

The following summarizes comparison of detected metals concentrations in surface water samples to DEQ RBCG (Table 3-21):

- Arsenic exceeded the DEQ RBCG (0.06 µg/L) in each of the surface water samples; 1.6 µg/L in the sample collected from MCSP-1 and 3.3 µg/L in the sample collected from the Road Cut location.

- Zinc exceeded the DEQ RBCG (17.2 µg/L) in the sample collected from MCSP-1 (31.4 µg/L).

- Detected concentrations did not exceed the DEQ RBCG for other metals analyzed, although the iron concentration was elevated in both samples (1,080µg/L, MCSP-1 and 1,810µg/L, Road Cut).

The following summarizes comparison of detected metals concentrations in surface water samples to Circular DEQ-7 standards (Table 3-22):

- Cadmium exceeded the CALS (0.097 µg/L) in the sample collected from MCSP-1 (0.26 µg/L). Cadmium concentrations did not exceed the HHS (5 µg/L) or AALS (0.52 µg/L) standards.

- Copper exceeded both the AALS (3.79 µg/L) and CALS (2.85 µg/L) in each of the samples, ranging from 107 µg/L (MCSP-1) to 16.8 (Road Cut). Copper did not exceed the HHS (1,300 µg/L).

- Iron exceeded both the HHS (300 µg/L) and the CALS (1,000 µg/L) in each of the surface water samples, ranging from 1,080 µg/L (MCSP-1) to 1,810 µg/L (Road Cut). AALS are not available for iron.

- Lead exceeded the CALS (0.545 µg/L) in each of the samples, ranging from 2.9 µg/L (MCSP-1) to 5.3 µg/L (Road Cut). Lead did not exceed the HHS (15 µg/L) or AALS (13.98 µg/L).

- Silver was not detected in the sample from MCSP-1. However, the reporting limit (0.5 µg/L) was higher than the AALS (0.374 µg/L). Silver did not exceed the HHS (100 µg/L). A standard is not available for the CALS.

- Detected concentrations did not exceed the HHS, AALS, or CALS for other metals analyzed.

Discharge rates for each surface water sample location are also tabulated in Tables 3-21 and 3-22. The discharge was measured as 0.39 cfs at MCSP-1. Discharge was not measured at the Road Cut sample location due to the sheet flow conditions.

Historical metals concentrations (analyzed as dissolved, total, or total recoverable metals) are presented in Table 3-23. As with other AOCs, results for the different methods are compared, despite the difference in procedure associated with each method. Similar to surface water samples at the Tim Smith Mine AOC, trends in the data are difficult to discern due to the low number of sampling events and the high number of non-detect results. MCSP-1 is the only sample location sampled more than once. Concentrations in samples were substantially higher in the 2011 samples than in samples collected during previous sampling, with the exception of antimony, cadmium, and silver. Trends for copper, iron, and zinc in samples from this location are shown on Figure F-29 in Appendix F.

3.5.3 Hazardous Materials Inventory Sampling Results

Five buildings/structures were identified as physical hazards at the Historic Mine AOC. Two buildings are located near the Lewis Shaft, the remains of the Harrison Shaft, the Harper Shaft and a small structure south of the Harper Shaft (Figure 2-6). The building located north of the Lewis Shaft is boarded up and a fence was installed surrounding the entrance to the building. The Lewis Shaft is fenced off and padlocked. A new hasp and lock was installed on the door to the Lewis Shaft during maintenance activities completed in late fall 2011. The Harrison Shaft rubble is standing in deteriorating condition. The Harper Shaft is sealed with a concrete cover and the small structure next to the Harper Shaft is empty.

3.5.3.1 Suspect Asbestos-Containing Materials

A total of eight samples were collected from five unique suspect building materials identified in or on the north and south buildings at the Lewis Shaft, the Harrison Shaft rubble, and a small structure adjacent to the access road south of the Harper Shaft (Figure 2-6) located in the Historic

Mine AOC. Asbestos was detected (**60% Chrysotile**) in the grout sample collected from the collapsed Harrison Shaft rubble (HM-ASB-35). Asbestos was not detected in other samples collected from suspect materials identified in the Historic Mine AOC.

3.5.3.2 Other Hazardous Building Materials

The five buildings/structures were also inspected for cooling systems with potential CFCs and for fluorescent or HID lights/fixtures. No CFC based cooling systems, or fluorescent or HID lights were observed.

Other potential hazardous materials or items that require recycling and/or disposal at the Historic Mine AOC include:

- Boxes of rock core samples
- Large conveyor drive unit
- Large fan/blower
- Small drum with unknown contents

3.6 Combination Mill AOC

3.6.1 Solid-Matrix Sampling Results

Nine subsurface soil, 52 sediment, and 22 tailings samples were collected from the Combination Mill AOC and analyzed for total recoverable metals and moisture content. Sample locations are shown on Figures 2-7 and 2-8. Sample CML-SD-05 is shown on Figure 2-3. Acid base accounting analysis was performed on 9 of the 22 tailings samples. The complete analytical results for solid-matrix samples collected at the Combination Mine AOC are presented in Appendix B-8; the laboratory reports are provided in Appendix C. Test pit CML-SS-11, shown on Figure 2-7, was excavated to investigate a potential repository area. Sample results for this test pit are presented in Section 7, Repository Site Investigation.

Total recoverable metals analytical results for tailings, soils, and sediment are compared against DEQ RBCG standards in Table 3-24 and discussed in Sections 3.6.1.1 through 3.6.1.3. Average metals concentrations for each type of sample, along with historical results are tabulated in Tables 3-25 (by event) and 3-26 (by location). Metals concentrations were elevated in 2011 RI samples collected across the Combination Mill AOC. Antimony, arsenic, lead, and mercury exceedance locations in the vicinity of the Combination Mill and tailings impoundments are shown on Figures 3-1, 3-2, 3-3, and 3-4, respectively. Average antimony, arsenic, barium, cadmium, copper, iron, lead, and silver concentrations were higher in the tailings samples than in soil or sediment samples. Average chromium, manganese, and nickel concentrations detected during the 2011 RI were highest in the sediment grid samples, while average cobalt and mercury concentrations were highest in the subsurface soil samples collected in the tailings test pits. The

average zinc concentrations were highest in the downstream sediment samples. Average antimony, arsenic, barium, copper, lead, iron, and silver concentrations in the sediment samples collected along South Fork Lower Willow Creek downstream of the tailings impoundment were higher than average concentrations for subsurface soil samples collected from the tailings impoundment test pits or in the sediment grid samples collected west of the tailings impoundment. The metals results in the downstream sediment samples were biased high due to the inclusion of sediment samples CML-SD-13, CML-SD-14, CML-SD-15, and CML-SD-16, and CML-SD-17, which were targeted at visually observed tailings or impacted sediments. The results for these sediment samples more closely resemble results for tailings samples.

Prior to this RI, tailings, soil, and sediment sampling had been completed in the vicinity of the Combination Mill and tailing impoundment and extending downstream along South Fork Lower Willow Creek. The tailings impoundment was partially reclaimed in 1994 by ASARCO. Some of the sampling events were completed prior to this partial reclamation and some following the reclamation. Four primary historical sampling events were conducted at the Combination Mill AOC. Analytical data is not available for the first investigation, completed by the USFS between 1988 and 1990. The other investigations include soils/tailings investigations by ASARCO in 1990; sediment, soils and tailings investigations by Schafer and Associates in 1991; and sediment, soils, and tailings investigations by Pioneer Technical Services in 1993 and 1995 (Hydrometrics 2010). Analytical data from the ASARCO, Schafer and Associates, and Pioneer Technical Services investigations, as well as the results for one sediment sample collected at the TMDL point SFWILLOWC04 in 2007, are tabulated in Tables 3-25 and 3-26 with the total recoverable metals results from the 2011 RI. Much of the metals data collected during the 1993 and 1995 Pioneer Technical Services Investigations are from XRF field screening. The Schafer and Associates investigation included 80 field pH measurements, which are not included in the tables.

Samples are grouped by sampling event and sample type in Table 3-25 and by location and sample type in Table 3-26. Table 3-26 only includes samples with mapped sample locations and; therefore, contains fewer samples than Table 3-25. Average concentrations have been calculated for each type of grouping in Tables 3-25 and 3-26, and both the average and individual sample metals concentrations are compared to the DEQ RBCG. Comparisons between current RI data and historical data are also discussed below in Sections 3.6.1.1 and 3.6.1.3. Historical sample locations are shown on Figure 3-6 in Appendix E.

ABA results are tabulated in Table 3-27 and discussed in Section 3.6.1.4.

3.6.1.1 Tailings

Twenty-two tailings samples were collected from 10 test pits at the Combination Mill AOC. Test pits CML-TS-01 through CML-TS-08 were excavated in the tailings impoundment; test pit CML-TS-09 was excavated near the foundation of the Combination Mill; and test pit CML-TS-10 was excavated near the “Old Mill” site on the west side of South Fork Lower Willow Creek (Figure 2-7). One surface (0 to 1 feet bgs) and one subsurface (2 to 4 feet bgs) sample was collected from test pits CML-TS-01 through CML-TS-07 and from CML-TS-10. One surface (0

to 1 feet bgs) and one subsurface (5 to 7 feet bgs) sample was collected from CML-TS-08, while one surface (0 to 1 feet bgs), and three subsurface (2 to 4, 4 to 6, and 6 to 8 feet bgs) samples were collected from CML-TS-09.

Metals concentrations were the highest in samples collected from test pit CML-TS-09. Detected metals concentrations did not exhibit trends based on the sample depth. Likewise, detected metals concentrations were not significantly different in the tailings samples than detected in the underlying soil samples, with the exception of the underlying soil samples collected at CML-SS-01, CML-SS-06, and CML-SS-08 that each had lower metals concentrations than the overlying tailings samples at these locations. Mercury concentrations were higher in the underlying soil samples than in the tailings samples collected from each test pit, except CML-TS-07. The tailings sample collected from CML-TS-07 at a depth of 2 to 4 feet bgs had a mercury concentration of 221 mg/kg, which was the highest mercury concentration detected in solid media during the RI. Mercury is a heavy metal and would be expected to be found in the deeper samples.

The following summarizes comparison of detected metals concentrations in tailings samples to DEQ RBCG (Table 3-24):

- Antimony exceeded the DEQ RBCG (293 mg/kg) in each of the tailings samples, except for those collected at CML-TS-02, and the samples collected from 2 to 4 feet bgs at CML-TS-01 and CML-TS-04 and the surface sample at CML-TS-08. The highest antimony concentrations were detected in samples collected in test pit CML-TS-09, ranging from 1,280 mg/kg in the sample collected from 2 to 4 feet bgs to 15,700 mg/kg in the sample collected from 6 to 8 feet bgs. The other antimony concentrations that exceeded the DEQ RBCG ranged from 324 mg/kg (surface sample from CML-TS-01) to 1,730 mg/kg (2 to 4 feet bgs at CML-TS-03).

- Arsenic exceeded the 95th UCL (40.4 mg/kg) in all but three of the tailings samples (CML-TS-01 from 2 to 4 feet bgs, CML-TS-02 from 0 to 1 feet bgs, and CML-TS-02 from 2 to 4 feet bgs). The four samples collected from CML-TS-09 contained the four highest concentrations of arsenic, ranging from 2,440 mg/kg in the surface sample to 5,140 mg/kg in the sample collected from 2 to 4 feet bgs. Concentrations in other samples ranged from 11.2 mg/kg in the surface sample at CML-TS-02 to 1,640 mg/kg in the surface sample collected from CML-TS-03.

- Cadmium exceeded the DEQ RBCG (19.5mg/kg) in three samples from CML-TS-09, two samples from CML-TS-03, two samples from CML-TS-06, one sample from CML-TS-05, and three samples from CML-TS-09. The three highest cadmium concentrations were detected in the samples collected from 6 to 8 feet bgs (99.9 mg/kg), surface (49.2 mg/kg), and 4 to 6 feet bgs (35.2 mg/kg) at CML-TS-09. Other concentrations that exceeded the DEQ RBCG ranged from 21 mg/kg in the sample collected from 2 to 4 feet bgs at CML-TS-05 to 31.8 mg/kg in the surface sample collected at CML-TS-03.

- Lead exceeded the DEQ RBCG (1,100 mg/kg) in each of the tailings samples, except for those collected at CML-TS-02, the surface sample collected at CML-TS-03, and the samples collected from 2 to 4 feet bgs at CML-TS-01 and CML-TS-04. The three highest lead concentrations were detected in the samples collected from 2 to 4 feet bgs (23,600 mg/kg), 4 to 6 feet bgs (15,100 mg/kg), and 6 to 8 feet bgs (12,600 mg/kg) at CML-TS-09. The other lead concentrations that exceeded the DEQ RBCG ranged from 1,290 mg/kg in the surface sample collected at CML-TS-08 to 10,000 mg/kg in the sample collected from 2 to 4 feet bgs at CML-TS-05.

- Manganese exceeded the DEQ RBCG (665 mg/kg) in the sample collected from 5 to 7 feet bgs at CML-TS-08 (1,120 mg/kg) and in the sample collected from 6 to 8 feet bgs at CML-TS-09 (815 mg/kg). Other manganese concentrations ranged from 84.4 mg/kg in the sample collected from 2 to 4 feet bgs at CML-TS-09 to 620 mg/kg in the surface sample collected at CML-TS-01.

- Mercury exceeded the DEQ RBCG (220 mg/kg) in the sample collected from 2 to 4 feet bgs at CML-TS-07 (221 mg/kg). Mercury was also elevated, though below the DEQ RBCG, in the surface sample collected at CML-TS-07 (215 mg/kg), the sample collected from 4 to 6 feet bgs at CML-TS-09 (137 mg/kg), and the sample collected from 2 to 4 feet bgs at CML-TS-06 (46.1 mg/kg).

- Detected concentrations did not exceed the DEQ RBCG for other metals analyzed, although the copper concentration in the sample collected from 6 to 8 feet bgs at CML-TS-09 (22,700 mg/kg) was just below the DEQ RBCG (27,100 mg/kg).

Tailings samples were previously analyzed in 1990 (ASARCO), 1991 (Schafer and Associates), and 1993 and 1995 (Pioneer Technical Services). All except for five of the tailings samples collected by Pioneer Technical Services were analyzed using XRF field methods. Composite samples from these 1993 and 1995 sampling events were analyzed for total metals. The XRF results closely approximated the total metals results. The XRF results are included in the comparisons of historical results below, though these results were not obtained through the same procedures as the total metals and total recoverable metals results.

Metals concentrations were similar across the sampling events and elevated across the sampling areas. Metals concentrations vary more with location of the individual sample, and at some locations with depth of the sample (e.g., CML-SD-04, TP1D, and TP1B), than with the date of the sample. Concentrations of antimony, arsenic, and lead exceeded DEQ RBCG in most of the samples. The highest metals concentrations were detected in samples collected from:

- TP1D-1 – located west of South Fork Lower Willow Creek near the lower end of the tailings impoundment and collected in 1993 prior to the partial reclamation of the tailings impoundment.

- TP1A-1 – location unknown, but assumed to be located within the footprint of the current tailings impoundment, near CML-TS-08, but collected in 1993 prior to the partial reclamation of the tailings impoundment.

- TP1C-1 – located within the footprint of the current tailings impoundment, near CML-TS-04, but collected in 1993 prior to the partial reclamation of the tailings impoundment.

- TP1B-2 – located within the footprint of the current tailings impoundment, just north of Mill Creek and near CML-TS-06, but collected in 1993 prior to the partial reclamation of the tailings impoundment.

- CML-TS-09 – Located adjacent to rubble from the Combination Mill at the southern extent of the tailings impoundment.

The following summarizes comparison of detected metals concentrations in historical and RI tailings impoundment samples based on the results tabulated in Table 3-26. This table only includes samples for which a known location exists; therefore, some sample results listed in Table 3-25 are not included. Only those samples, including soil and/or sediment samples, located within the footprint of the existing tailings impoundment are included in the comparison. Other tailings samples collected from outside of the tailings impoundment are compared to soil and sediment samples in Section 3.6.1.3. Historical sample locations are shown on Figure 3-6 in Appendix E.

- Antimony was not analyzed in the 1990 ASARCO samples or the 1991 Schafer and Associates samples. Cadmium was only analyzed in the 1990 ASARCO sample and one sample (TP1B-2) in 1993 prior to 2011. Nickel was not analyzed in historical tailings samples.

- The four highest antimony concentrations were detected in samples collected from 6 to 8 feet bgs at CML-TS-09 (15,700 mg/kg), and from TP1B-2 (13,277mg/kg), TP1A-1 (11,477 mg/kg), TP1C-1 (4,201 mg/kg), and TP1D-1 (4,184 mg/kg). Other concentrations detected above the DEQ RBCG for antimony ranged from 324 mg/kg (surface sample at CML-TS-01) to 3,210 mg/kg (surface sample at CML-TS-09).

- The four highest arsenic concentrations were detected in samples collected form CML-TS-09 (2,440 mg/kg to 5,140 mg/kg). The highest historical concentrations were detected in BP-Tailings (1,684 mg/kg) and TP1B-2 (1,402 mg/kg). Other concentrations detected above the 95th UCL for arsenic ranged from 50.60 mg/kg (CML-TS-04 at 2 to 4 ft bgs) to 1,640 mg/kg (surface sample at CML-TS-03).

- The highest copper concentrations have been detected in the samples collected from 6 to 8 feet bgs at CML-TS-09 (22,700 mg/kg), from TP1B-2 (10,142 mg/kg), TP1A-1 (8,771 mg/kg), and TP1D-1 (6,881 mg/kg). Copper has been detected over 2,000

mg/kg in 14 other samples, including historical samples 88-6A (2,890 mg/kg), 88-7A (3,860 mg/kg), TP1C-1 (3,871 mg/kg), and BP-Tailings (5,084 mg/kg).

- The four highest iron concentrations were detected in samples collected from CML-TS-09 (50,700 mg/kg to 67,700 mg/kg). The highest historical concentrations were detected in samples from TP1B-2 (34,376 mg/kg) and TP1D-1 (33,141 mg/kg). Other iron concentrations have ranged from 5,640 mg/kg (CML-SS-03) to 29,300 mg/kg (CML-TS-03, 2 to 4 feet bgs).

- Three of the five highest lead concentrations were detected in samples from CML-TS-09 (12,600 mg/kg to 23,600 mg/kg). The highest historical concentrations were detected in samples from TP1B-2 (14,817 mg/kg), TP1A-1 (14,598 mg/kg) and BP-Tailings (10,650 mg/kg). Other lead concentrations above the DEQ RBCG ranged from 1,120 mg/kg (CML-TS-00,) to 10,000 mg/kg (CML-TS-05, 2 to 4 feet bgs).

- Manganese concentrations have exceeded the DEQ RBCG in 10 samples collected from within the tailings impoundment footprint since 1993. These include the samples collected at CML-SS-07 (1,600 mg/kg), TP1D-1 (1,383 mg/kg), CML-SS-01 (1,300 mg/kg), 5 to 7 feet bgs at CML-TS-08 (1,120 mg/kg), TP1C-3 (958.5 mg/kg), BP-1 (907.0 mg/kg), 6 to 8 feet bgs at CML-TS-09 (815.0 mg/kg), TP1B-2 (704.5 mg/kg), TP1B-3 (704.0 mg/kg), and TP1A-1 (703.0 mg/kg).

- The highest mercury concentrations were detected in samples collected from TP1B-2 (539.6 mg/kg), TP1C-1 (484.8 mg/kg), TP1D-1 (462.8 mg/kg), TP1A-1 (428 mg/kg), TP1C-3 (261.5 mg/kg), BP-Tailings (250 mg/kg), and 2 to 4 feet bgs at CML-TS-07 (221 mg/kg). Mercury concentrations have exceeded 10 mg/kg in 18 other soil or tailings samples collected within the tailings impoundment footprint.

- The highest silver concentrations have been detected in samples collected from TP1B-2 (810.8 mg/kg); TP1A-1 (623.3 mg/kg); 88-5A (573.0 mg/kg), located in the southern portion of the tailings impoundment; and 88-4A (494.0 mg/kg), located just northwest of 88-5A.

- The highest zinc concentrations were detected in samples collected from the surface (1,110 mg/kg) and 6 to 8 feet bgs (1,570 mg/kg) at CML-TS-09, and 2 to 4 feet bgs at CML-TS-03 (735.0 mg/kg). The highest zinc concentration in a historical sample was detected in TP1B-2 (560.3 mg/kg).

3.6.1.2 Soil

One subsurface soil sample was collected from each of the eight test pits excavated in the Combination Mill tailings impoundment and the test pit excavated near the “Old Mill” on the west side of South Fork Lower Willow Creek. A total of nine soil samples were collected from ten test pit locations. Each soil sample was collected from below the tailings/soil interface. A distinguishable interface was not encountered in test pit CML-TS-09 so each sample from this

location was recorded as a tailings sample. The soil sample collected from CML-SS-02 appears to have the lowest metals concentrations, while the samples collected from CML-SS-05 and CML-SS-03 showed the highest metals concentrations.

The following summarizes comparison of detected metals concentrations in soil samples to DEQ RBCG (Table 3-24):

- Antimony exceeded the DEQ RBCG (293 mg/kg) in the soil samples collected from CML-SS-05 (1,260 mg/kg) and CML-SS-03 (750 mg/kg). Other concentrations ranged from 1.9 mg/kg (CML-SS-08 at 7 to 9 feet bgs) to 167 mg/kg (CML-SS-01).

- Arsenic exceeded the 95th UCL (40.4 mg/kg) in all but three of the samples (CML-SS-02, CML-SS-07, and CML-SS-08). The highest concentrations were detected in the samples from CML-SS-05 (1,030 mg/kg) and CML-SS-03 (777 mg/kg). Other concentrations ranged from 8.3 mg/kg (CML-SS-08) to 176 mg/kg (CML-SS-06).

- Cadmium exceeded the DEQ RBCG (19.5 mg/kg) in the samples from CML-SS-06 (63.1 mg/kg) and CML-SS-05 (23.1 mg/kg).

- Lead exceeded the DEQ RBCG (1,100 mg/kg) in the samples collected from CML-SS-05 (8,010 mg/kg), CML-SS-03 (5,310 mg/kg), CML-SS-10 (1,830 mg/kg), and CML-SS-01 (1,120 mg/kg).

- Manganese exceeded the DEQ RBCG (665 mg/kg) in the samples collected from CML-SS-07 (1,600 mg/kg), CML-SS-01 (1,300 mg/kg), and CML-SS-10 (1,050 mg/kg).

- Detected concentrations did not exceed the DEQ RBCG for other metals analyzed, although mercury (six samples above 10 mg/kg) and copper (four samples above 2,000 mg/kg) were elevated in a number of the soil samples. The highest mercury concentration (130 mg/kg) was detected in the soil sample collected from CML-SS-08.

Sufficient information does not exist in the historical data to separate historical soil from sediment or tailings samples. Historical samples that may have been collected from soils are included in the comparison of historical tailings (CML-SS-01 through CML-SS-08) (Section 3.6.1.1) or sediment (CML-SS-10) (Section 3.6.1.3) data.

3.6.1.3 Sediment

Fifty-two sediment samples were collected from 45 sample locations within the South Fork Lower Willow Creek floodplain. Four samples (CML-SD-01 through CML-SD-04) were collected from four TMDL sites; two samples were collected from ponds located on the tailings impoundment (CML-SD-06 and CML-SD-07); one sample was located near the confluence of the Tim Smith drainage and South Fork Lower Willow Creek (CML-SD-05); nine were located

downstream of the Combination Mill and tailings impoundment; and the remaining locations were located in a grid west of the tailings impoundment (Figures 2-3, 2-7 and 2-8).

Metals concentrations decreased moving downstream from the Combination Mill and tailings impoundment, but were dependent on the location of individual samples. Samples that were located based on visual observation of apparent tailings or impacted sediments exhibited higher metals concentrations. Five sediment sample locations (CML-SD-17, CML-SD-16, CML-SD-15, CML-SD-14, and CML-SD-13) were identified in the field to target suspected tailings depositional areas downstream of the tailings impoundment along South Fork Lower Willow Creek. Samples collected at three of these five locations (CML-SD-17, CML-SD-16, and CML-SD-15) contained the highest metals concentrations of the sediment samples collected during the RI. Results for these samples more closely match the results for tailings samples. CML-SD-14, which also contained elevated metals concentrations as compared to other sediment samples, was collected in an area devoid of vegetation associated with a former amalgamation mill on USFS administered lands. This former mill site is located approximately one mile downstream from the Trust property boundary (Hydrometrics 2010).

Metals concentrations in samples collected from CML-SD-10, located approximately 100 feet downstream from CML-SD-15, and CML-SD-11, located approximately 5000 feet downstream of CML-SD-16, but upstream of CML-SD-15 were substantially lower than metals concentrations than CML-SD-15 and CML-SD-16. The sharp differences in these results indicate the accuracy of visual observation of impacted tailings deposited downstream. The furthest downstream sample, CML-SD-01, was collected at TMDL site SFLWILLOWC03. Metals concentrations detected in this sample were lower than in upstream sediment samples. However, the antimony (317 mg/kg) and arsenic (223 mg/kg) exceeded the DEQ RBCG in this sample.

Metals concentrations detected in sediment samples located upstream of the Combination Mill and tailings impoundment were lower than downstream metals concentrations, with the exception of manganese concentrations in CML-SD-05 (1,160 mg/kg) and CML-SD-04 (1,980 mg/kg). Upstream sample locations included CML-SD-05 (confluence of Tim Smith Drainage and South Fork Lower Willow Creek), CML-SD-04 (TMDL site SFLWILLOWC05), and CML-SD-03 (TMDL site SFLWILLOWC04.5).

The following summarizes comparison of detected metals concentrations in sediment samples to DEQ RBCG (Table 3-24):

- Antimony exceeded the DEQ RBCG (293 mg/kg) in 23 sediment samples. The three highest concentrations were detected in the samples from CML-SD-16 (2,130 mg/kg), located approximately 1,250 feet downstream from the Trust property boundary; CML-SD-15 (1,300 mg/kg), located 3,000 feet downstream from CML-SD-16; and CML-SD-17 (1,090 mg/kg), located between CML-SD-16 and the Trust property boundary. The other concentrations that exceeded the DEQ RBCG ranged from 293 mg/kg (CML-SD-35) to 1,010 mg/kg (CML-SD-14).

- Arsenic exceeded the 95th UCL (40.4 mg/kg) in all but 13 of the 52 sediment samples. Similar to antimony, the three highest concentrations were detected in the samples from CML-SD-16 (1,670 mg/kg), CML-SD-15 (1,250 mg/kg), and CML-SD-17 (745 mg/kg. Other concentrations ranged from 7.8 mg/kg (CML-SD-45) to 668 mg/kg (CML-SD-14).

- Cadmium exceeded the DEQ RBCG (19.5 mg/kg) in seven of the sediment samples. The highest concentration was detected in the sample from CML-SD-15 (32.5 mg/kg), and the concentration in CML-SD-16 (26.6 mg/kg) was also elevated. The cadmium concentration (28.6 mg/kg) exceeded the DEQ RBCG in the sediment sample (CML-SD-06) collected from the south tailings sediment pond. The remaining exceedances were in samples collected from grid sediment samples CML-SD-29 (27.6 mg/kg), CML-SD-20 (25.9 mg/kg), CML-SD-21(22.5 mg/kg), and CML-SD-33 (20.6 mg/kg).

- Lead exceeded the DEQ RBCG (1,100 mg/kg) in 26 sediment samples. Three of the five highest concentrations were detected in samples from CML-SD-15 (8,050 mg/kg), CML-SD-16 (7,330 mg/kg), and CML-SD-17 (3,880 mg/kg). The other concentrations that exceeded the DEQ RBCG ranged from 1,170 mg/kg (CML-SD-11) to 4,240 mg/kg (CML-SD-07). Sample CML-SD-07 was collected from the north tailings sediment pond.

- Manganese exceeded the DEQ RBCG (665 mg/kg) in 25 sediment samples. The highest concentrations were detected in samples from CML-SD-24 (2,050 mg/kg), located near the northern (downstream) extent of the tailings impoundment; CML-SD-04 (1,980 mg/kg), located upstream of the Combination Mill and tailings impoundment; and CML-SD-18 (1,640 mg/kg), located downstream of the tailings impoundment and just above the Trust property boundary. The other concentrations that exceeded the DEQ RBCG ranged from 666 mg/kg (CML-SD-35) to 1,300 mg/kg (CML-SD-38).

- Detected concentrations did not exceed the DEQ RBCG for other metals analyzed, although mercury (16 samples above 10 mg/kg) and copper (nine samples above 2,000 mg/kg) were elevated in a number of the soil samples. In addition to the metals discussed above, the sample collected from CML-SD-15 had the highest detected iron, silver, and zinc concentrations, and one of the highest copper concentrations.

Sediment samples were previously analyzed in 1991 (Schafer and Associates), 1993 (Pioneer Technical Services), and 1995 (Pioneer Technical Services). Two of the samples collected by Pioneer Technical Services in 1993 were analyzed with XRF field methods. Metals concentrations were similar across the sampling events for specific areas (e.g. samples collected near the former amalgamation mill on USFS administered lands and samples collected between the tailings impoundment and the amalgamation mill). Metals concentrations did not appear lower in sampling events conducted after the partial reclamation of the tailings impoundment as compared to sampling events completed prior to the partial reclamation. However, some metals concentrations were higher in samples collected prior to the tailings reclamation (e.g. 88-10A and 88-8B). These areas may have been addressed during the tailings impoundment reclamation, but documentation of the extent of the reclamation could not be located. Similar to the tailings samples, variation in metals concentrations appear to vary more with location of the individual sample than with the date or type of sample; there appears to be discrete areas of higher metals concentrations located both to the west and downstream of the tailings impoundment. Also similar to the tailings samples, concentrations of antimony, arsenic, and lead exceeded DEQ RBCG in most of the samples.

Sediment samples are grouped in Table 3-26 by their location. Similar to comparison of samples within the tailings impoundment, samples listed in Table 3-25 that did not have known location information are not included in Table 3-26. Samples are compared by their location relative to the 2011 RI samples rather than by their original sample type. For example, some historical samples designated as tailings samples are compared to 2011 RI sediment and soil samples based on their location. Likewise, tailings samples collected from test pit CML-TS-10 are included in the comparison of sediments and soils west of the existing tailings impoundment. The comparison was completed in this manner to highlight areas of metals impacts outside of the existing tailings impoundment. Historical sample locations are shown on Figure 3-6 in Appendix E. The seven groupings include:

- The furthest downstream sediment samples collected near TMDL site SFLWILLOWC03.

- Sediment samples collected adjacent to South Fork Lower Willow Creek downstream of the former amalgamation mill.

- Samples collected at or near the former amalgamation mill on USFS administered lands, including sediment, soil and tailings samples.

- Sediment, soil, and tailings samples collected downstream of the Combination Mill tailings impoundment and upstream of the former amalgamation mill.

- Sediment samples collected from the two sediment ponds located in the tailings impoundment.

- Sediment samples collected in the area of the Combination Mill and tailings impoundment, but typically west of South Fork Lower Willow Creek, including the

RI grid samples and the tailings sample collected in the area of the "Old Mill" (CML-TS-10).

- Sediment and soil samples collected upstream (either on Mill Creek or South Fork Lower Willow Creek) of the Combination Mill and tailings impoundment.

Metals concentrations tended to be higher in samples collected in the area near the former amalgamation mill on USFS administered lands and in sediment samples collected between the tailings impoundment and the former amalgamation mill area. Metals concentrations decrease moving downstream of the former amalgamation mill area, although one downstream location, TP4B, had metals concentrations similar to those detected in samples collected near the former amalgamation mill. With the exception of iron, manganese, and nickel, and sample location 88-10A, detected metals concentrations were lower in samples collected west of South Fork Lower Willow Creek in the area of the Combination Mill and tailings impoundment than in downstream samples. With the exception of manganese and nickel, metals concentrations in samples collected in areas upstream of the Combination Mill and tailings impoundment were significantly lower than concentrations in other sediment samples. The following summarizes comparison of detected metals concentrations in historical and RI sediment samples (Tables 3-25 and 3-26). Historical sample locations are shown on Figure 3-6 in Appendix E.

- Antimony, cadmium, manganese, nickel, and silver were only analyzed in a limited number of historical samples.

- The average calculated antimony concentration was highest in samples collected from the former amalgamation mill area (4,373 mg/kg) and between this area and the tailings impoundment (2,035 mg/kg). Average calculated concentrations were lower for samples collected downstream of the former amalgamation mill area (1,196 mg/kg), and significantly lower for samples collected west of the tailings impoundment (236.7 mg/kg), in the tailings impoundment sediment ponds (854 mg/kg), and near TMDL site SFLWILLOWC03 (250.7 mg/kg). The calculated average concentration in the upstream samples was 11.27 mg/kg).

- The highest antimony concentrations were detected in samples collected in 1995 from TP4B (7,876 mg/kg), located downstream of the former amalgamation mill; TP2B (7,239 mg/kg), located upstream from CML-SD-15; TP3B (5,780 mg/kg), TP3A (5,605 mg/kg), and TP3C (5,097 mg/kg), located in the former amalgamation mill area. Remaining antimony concentrations ranged from non-detect at a reporting limit of 0.64 mg/kg (CML-SD-05) to 4,067 mg/kg (TP2D, located between CML-SD-11 and CML-SD-16).

- The average calculated arsenic concentration was highest in samples collected from the tailings impoundment sediment ponds (619 mg/kg) and between the tailings impoundment and the former amalgamation mill (436.3 mg/kg). Average calculated concentrations were lower, but similar, for samples collected at the former amalgamation mill (414.9 mg/kg), downstream of the former amalgamation mill area

(328.0 mg/kg), west of the tailings impoundment (284.4 mg/kg), and near TMDL site SFLWILLOWC03 (273.3 mg/kg). The calculated average concentration in the upstream samples was 11.60 mg/kg.

- The highest arsenic concentrations were detected in samples collected from CML-SD-16 (1,670 mg/kg), CML-TS-10 (1,250 mg/kg and 1,400 mg/kg), CML-SD-15 (1,250 mg/kg), and 88-10A (1,150 mg/kg). Sample location 88-10A was located on the west side of South Fork Lower Willow Creek, upstream of CML-SD-24. This sample was collected in 1991, prior to the partial reclamation of the tailings impoundment. Remaining arsenic concentrations ranged from non-detect at a reporting limit of 5 mg/kg (sample location 202, located upstream of the Combination Mill) to 1,090 mg/kg (88-8B, located just downstream from the Trust property boundary).

- The average calculated cadmium concentration was highest in samples collected from the former amalgamation mill area (78.93 mg/kg). Average calculated concentrations were significantly lower for samples collected in the tailings impoundment sediment ponds (22 mg/kg), between the tailings impoundment and the former amalgamation mill (15.65 mg/kg), west of the tailings impoundment (9.43 mg/kg), near TMDL site SFLWILLOWC03 (9.43 mg/kg), and downstream of the former amalgamation mill area (7.21 mg/kg). The calculated average concentration in the upstream samples was 1.01 mg/kg.

- The highest cadmium concentration was detected in a sample collected in 1995 from TP3C (143.2 mg/kg), located at the former amalgamation mill area. Remaining cadmium concentrations were significantly lower and ranged from 0.43 mg/kg (CML-SD-03, located on Mill Creek above the tailings impoundment) to 32.50 mg/kg (CML-SD-15).

- The average calculated copper concentration was highest in samples collected from tailings impoundment sediment ponds (4,470 mg/kg), the former amalgamation mill area (2,250 mg/kg) and between this area and the tailings impoundment (2,413 mg/kg). Average calculated concentrations were lower for samples collected downstream of the former amalgamation mill area (1,153 mg/kg), west of the tailings impoundment (1,117 mg/kg), and near TMDL site SFLWILLOWC03 (826.0 mg/kg). The calculated average concentration in the upstream samples was 45.96 mg/kg.

- The highest copper concentrations were detected in samples collected in 1991 from 88-10A (8,650 mg/kg) and 88-8B (8,410 mg/kg). Remaining copper concentrations ranged from 18.8 mg/kg (SE-3, located in South Fork Lower Willow Creek west of the former amalgamation mill) to 5,320 mg/kg (CML-SD-07).

- The average calculated iron concentration was similar for each area, ranging from 14,918 mg/kg near TMDL site SFLWILLOWC03 to 21,500 mg/kg for the samples

collected from the tailings impoundment sediment ponds. The calculated average concentration in the upstream samples was 11,705 mg/kg.

- The average calculated lead concentration was highest in samples collected from tailings impoundment sediment ponds (4,000 mg/kg), the former amalgamation mill area (3,735 mg/kg) and between this area and the tailings impoundment (3,627 mg/kg). Average calculated concentrations were lower for samples collected downstream of the former amalgamation mill area (1,950 mg/kg), west of the tailings impoundment (1,940 mg/kg), and near TMDL site SFLWILLOWC03 (1,001 mg/kg). The calculated average concentration in the upstream samples was 52.44 mg/kg.

- The highest lead concentrations were detected in samples collected in 1991 from 88-8B (21,300 mg/kg) and 88-10A (20,500 mg/kg). These concentrations were significantly higher than other lead concentrations detected in sediment samples, including CML-SD-15 (8,050 mg/kg) and CML-SD-16 (7,330 mg/kg). Remaining lead concentrations ranged from 16 mg/kg (202) to 5,610 mg/kg (209, located downstream of CML-SD-11).

- The average calculated manganese concentration was highest in the upstream samples (1,124 mg/kg). Average calculated concentrations for the other areas ranged from 257.0 mg/kg for samples collected from the former amalgamation mill area to 891.0 mg/kg for samples collected from the tailings impoundment sediment ponds. The highest individual detections were observed in upstream samples and grid samples located west of the tailings impoundment.

- The average calculated mercury concentration was highest in samples collected from the former amalgamation mill area (127.4 mg/kg) and between this area and the tailings impoundment (95.01 mg/kg). Average calculated concentrations were lower for samples collected downstream of the former amalgamation mill area (59.15 mg/kg), near TMDL site SFLWILLOWC03 (38.87 mg/kg), in the tailings impoundment sediment ponds (21.45 mg/kg), and west of the tailings impoundment (10.36 mg/kg). The calculated average concentration in the upstream samples was 2.99 mg/kg.

- The highest mercury concentrations were detected in samples collected in 1995 from TP2D (400 mg/kg), located between CML-SD-16 and CML-SD-11; 88-8B (393.0 mg/kg), TP4B (369.5 mg/kg), and TP2B (253.1 mg/kg). Remaining mercury concentrations ranged from 0.062 (SE-3) to 191.8 mg/kg (TP3A).

- The average calculated nickel concentration was highest in the upstream samples (11.30 mg/kg). Average calculated concentrations for the other areas ranged from 2.65 mg/kg near TMDL site SFLWILLOWC03 to 10.35 mg/kg for the samples collected from the tailings impoundment sediment ponds.

- The average calculated silver concentration was highest in samples collected from the former amalgamation mill area (152.7 mg/kg) and between this area and the tailings impoundment (103.3 mg/kg). Average calculated concentrations were lower for samples collected downstream of the former amalgamation mill area (61.34 mg/kg), in the tailings impoundment sediment ponds (51.10 mg/kg), west of the tailings impoundment (19.02 mg/kg), and near TMDL site SFLWILLOWC03 (18.75 mg/kg),. The calculated average concentration in the upstream samples was 1.37 mg/kg.

- The highest silver concentrations were detected in samples collected in 1995 from TP2B (272.0 mg/kg), TP4B (244.2 mg/kg), TP3A (219.9 mg/kg), and TP3C (215.2 mg/kg). Remaining silver concentrations ranged from non-detect at a reporting limit of 0.64 mg/kg (CML-SD-05) to 213 mg/kg (CML-SD-15).

- The average calculated zinc concentration was similar for each area, ranging from 253 mg/kg for samples collected west of the tailings impoundment to 580.5 mg/kg for the samples collected from the tailings impoundment sediment ponds. The calculated average concentration in the upstream samples was 94.29 mg/kg. The highest zinc concentration was detected in the sample form CML-SD-15 (1,300 mg/kg).

3.6.1.4 Acid Base Accounting

Nine tailings samples were collected and analyzed for ABA from the Combination Mill AOC. The results from the ABA analyses can be found in Table 3-27 and are summarized below:

- Sulfur levels in the samples ranged from <0.05% to 0.23%

- Acid potential ranged from <4.3 t/kt to 1.6 t/kt

- Neutralization potential ranged from <0.5 t/kt to 8.3 t/kt

- Lime requirements ranged from <5.4 t/kt to 11 t/kt

- Acid base potential or net neutralization potential ranged from -1.6 t/kt to 8.3 t/kt

The acid base potential or net neutralization potential falls within the -20 t/kt to +20 t/kt, which is considered to have uncertainty and the potential to generate acid exists (EPA 1994a). Lime amendments, if necessary, are low and would require a maximum of 8.1 tons of lime for every 1000 tons of waste. CML-TS-05, located centrally in the north tailings impoundment, has the only negative net neutralization potential, which means that acid potential is larger than the neutralization potential.

3.6.2 Water-Matrix Sampling Results

Eighteen surface water and two field duplicate samples were collected at the Combination Mill AOC. Field parameters were collected for each water sample and the samples were submitted to

Pace Analytical for analysis of total recoverable metals and laboratory parameters. The complete analytical results, including field and laboratory parameters, for water-matrix samples collected at the Combination Mill AOC are presented in Appendix B-9; the laboratory reports are provided in Appendix B. Total recoverable metals analytical results are presented in Tables 3-28 (DEQ RBCG) and 3-29 (Circular DEQ-7). Table 3-30 presents the surface water metals loading rates for synoptic sample stations.

The discharge rates detected as part of the synoptic sampling are presented in Table 3-30 and Figures 3-5 and 3-6. South Fork Lower Willow Creek discharge ranged from 36.9 cfs at the top of the study reach (CML-SW-05) to 76.5 cfs at the bottom of the study reach (CML-SW-01). In general, South Fork Lower Willow Creek discharge increases as it flows downstream. Although four tributaries were observed flowing into the South Fork Lower Willow Creek along the study area, much of the water contributing to flow is attributed to groundwater, both in tributary hyporheic contribution and interflow from the adjacent hillsides. Relatively low discharge rates were observed in the tributary streams, ranging from less than 0.1 cfs at CML-SW-17 and CML-SW-18 to 2.75 cfs at Mill Creek (CML-SW-03) and 4.50 cfs at Tim Smith Drainage sample location TSP-6. South Fork Lower Willow Creek discharge decreased in two reaches, between CML-SW-15 and CML-SW-16 and between CML-SW-10 and CML-SW-09, where water likely was lost to the hyporheic zone, reappearing again downstream.

Prior to this RI, surface water samples and limited shallow groundwater samples, from test pits, had been collected upstream, adjacent to, and downstream of the Combination Mill and tailings impoundment. Water samples were first collected in 1981 as part of a baseline study. Water samples were also collected in 1990 by ASARCO, 1991 as part of the Schafer and Associates study for the USFS, and in 1993 and 1995 by Pioneer Technical Services. In addition, surface water samples have been collected, beginning in 2007, at four TMDL sample sites, and in 2000 and 2001 at two routine surface water monitoring sites (Hydrometrics 2010). Analytical data from these sampling events are tabulated in Table 3-31 with the total recoverable metals results from the RI. One historical sample (location 1A) was analyzed for dissolved metals as opposed to total or total recoverable metals. The results for this sample are included and compared to results from other samples analyzed although the method of analyses differed. Historical sample locations are shown on Figure 3-7 in Appendix E.

The following summarizes comparison of detected metals concentrations in surface water samples to DEQ RBCG (Table 3-28):

- Antimony exceeded the DEQ RBCG (91.1 µg/L) in sample CML-SW-06 (117 µg/L) collected from the south tailings impoundment sediment pond. Antimony did not exceed the DEQ RBCG in other samples, although it was elevated in the sample from CML-SW-07 (42.9 µg/L) collected from the north tailings impoundment sediment pond.

- Arsenic exceeded the DEQ RBCG (0.06 µg/L) in each of the Combination Mill AOC water samples. Arsenic was below the detection limit (0.50 µg/L) in three upstream samples on South Fork Lower Willow Creek, including CML-SW-05, CML-SW-13,

and CML-SW-19, as well as sample collected from two small tributaries to South Fork Lower Willow Creek, CML-SW-17 and CML-SW-18. Other detected arsenic concentrations ranged from 0.51 µg/L in the sample collected at CML-SW-14 to 36 µg/L in the sample collected at CML-SW-06.

- Lead exceeded the DEQ RBCG (47.1 µg/L) in sample CML-SW-07 (49 µg/L) collected from the north tailings impoundment sediment pond. Lead did not exceed the DEQ RBCG in samples collected from South Fork Lower Willow Creek or its tributaries.

- Manganese exceeded the DEQ RBCG (16.60 µg/L) in sample CML-SW-06 (39.10 µg/L). Manganese did not exceed the DEQ RBCG in samples collected from South Fork Lower Willow Creek or its tributaries.

- Mercury exceeded the DEQ RBCG (0.150 µg/L) in seven samples, including CML-SW-06 (1.91 µg/L) and CML-SW-07 (2.52 µg/L). Mercury exceeded the DEQ RBCG in the last five downstream water samples on South Fork Lower Willow Creek. Between CML-SW-02 and CML-SW-11 there is the most rapid increase in mercury when compared to other sample locations (Figure 3-5, included below). This mercury contribution is not from the surface water tributary (CML-SW-17) in this reach so the increase is likely from interflow or hyporheic flow through uncontained tailings located within the floodplain. There is a similar sharp increase in mercury concentrations and loading between stations CML-SW-09 and CML-SW-01 (Figure 3-6), this is likely due to a large, uncontained tailings area and former amalgamation mill site on USFS administered lands.

- Zinc exceeded the DEQ RBCG (17.20 µg/L) in samples CML-SW-06 (63.10 µg/L) and CML-SW-07 (40.50 µg/L). Zinc did not exceed the DEQ RBCG in samples collected from South Fork Lower Willow Creek or its tributaries.

- Detected concentrations did not exceed the DEQ RBCG for other metals analyzed.

The following summarizes comparison of detected metals concentrations in surface water samples to Circular DEQ-7 standards (Table 3-29):

- Antimony exceeded the HHS (5.6 µg/L) in the samples collected from CML-SW-06 (117.0 µg/L) and CML-SW-07 (42.90 µg/L). Antimony AALS and CALS have not been adopted.

- Arsenic exceeded the HHS (10 µg/L) in the samples collected from CML-SW-06 (36.00 µg/L) and CML-SW-07 (12.80 µg/L). Arsenic concentrations did not exceed the AALS (340 µg/L) or CALS (150 µg/L) standards.

- Cadmium exceeded both the AALS (0.52 µg/L) and the CALS (0.097 µg/L) in the samples collected from CML-SW-06 (1.10 µg/L) and CML-SW-07 (1.20 µg/L).

Cadmium also exceeded CALS in water samples from five of the last six downstream samples on South Fork Lower Willow Creek, including CML-SW-16 (0.110 µg/L), CML-SW-10 (0.120 µg/L), CML-SW-09 (0.130 µg/L), CML-SW-08 (0.120 µg/L), and CML-SW-01 (0.150 µg/L).

- Copper concentrations did not exceed the HHS (1,300 µg/L) in any of the samples. Copper exceeded the AALS (3.79 µg/L) or CALS (2.85 µg/L) in all water samples except the first two upstream samples (CML-SW-05 and CML-SW-13) on South Fork Lower Willow Creek. Copper concentrations collected at the tributary sample sites, CML-SW-17 and CML-SW-18 also did not exceed either the AALS or CALS. Concentrations in the samples collected from CML-SW-14 (3.50µg/L) and CML-SW-19 (3.60 µg/L) exceeded the CALS, but not the AALS standard. The greatest increase in copper concentrations occurred between stations CML-SW-14 and CML-SW-02, in the area of the tailings impoundments (Figure 3-5).

- Iron exceeded HHS (300 µg/L) in the samples collected from CML-SW-07 (1,430 µg/L), CML-SW-03 (1,450 µg/L), CML-SW-19 (308 µg/L), and 9 of 10 downstream water samples on South Fork Lower Willow Creek. Concentrations in these downstream water samples ranged from 321 µg/L (CML-SW-15) to 617 µg/L (CML-SW-01). Iron also exceeded CALS in samples collected from CML-SW-03 and CML-SW-07. An AALS has not been established for iron.

- Lead exceeded the HHS (15 µg/L), AALS (13.98 µg/L) and CALS (0.545 µg/L) in the sample collected from CML-SW-07 (49.00 µg/L). Lead concentrations also exceeded the CALS in the last eight downstream water samples on South Fork Lower Willow Creek, and the samples collected from CML-SW-06 (6.70 µg/L), and CML-SW-03 (2.9 µg/L). Concentrations in the last eight downstream samples ranged from 0.61 µg/L (CML-SW-15) to 5.10 µg/L (CML-SW-16).

- Mercury exceeded the HHS (0.05 µg/L), AALS (1.7 µg/L), and CALS (0.91 µg/L) in the samples collected from CML-SW-06 (1.91 µg/L) and CML-SW-07 (2.52 µg/L). Mercury exceeded the HHS in six of the last seven downstream water samples on South Fork Lower Willow Creek, as well as CML-SW-03 (0.123 µg/L). Concentrations in the downstream samples ranged from 0.077 µg/L (CML-SW-02) to 0.357 µg/L (CML-SW-01).

- Silver exceeded the AALS (0.374 µg/L) in each of the sample locations. Silver was not detected at a reporting limit of 0.5 µg/L in each sample, except for the sample collected at CML-SW-07 (0.640 µg/L). No CALS has been established for silver. Silver did not exceed the HHS (100 µg/L).

- Zinc exceeded both the AALS and CALS (37 µg/L) in the samples collected from CML-SW-06 (63.10 µg/L) and CML-SW-07 (40.50 µg/L).

In several reaches metals concentrations decreased between sampling locations (e.g., mercury between CML-SW-10 and CML-SW-09; cadmium and lead between CML-SW-16 and CML-SW-11) (Figure 3-5). Decreasing concentrations indicate that metals processing may be occurring in these reaches (e.g., biotic uptake or sorption to inorganic and organic sediments).

Figure 3-5. South Fork Lower Willow Creek Synoptic Sampling – Discharge and Metals Concentrations

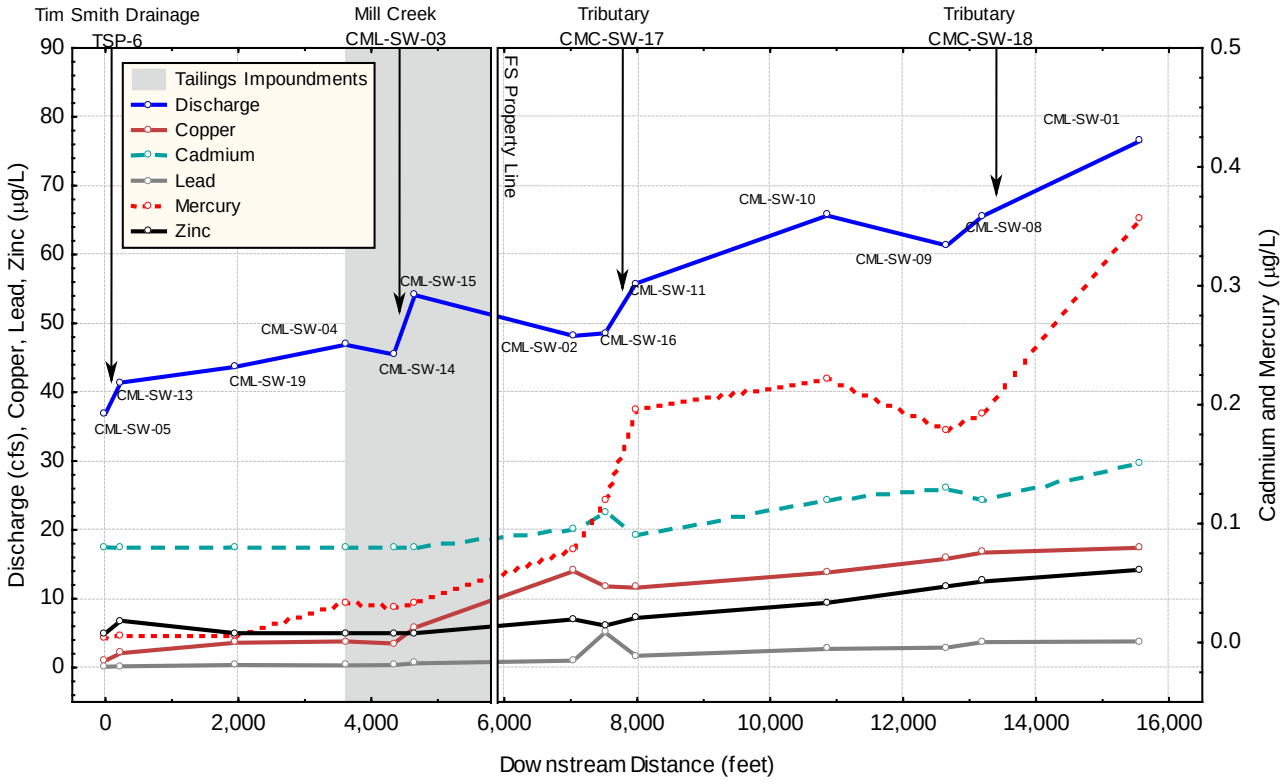
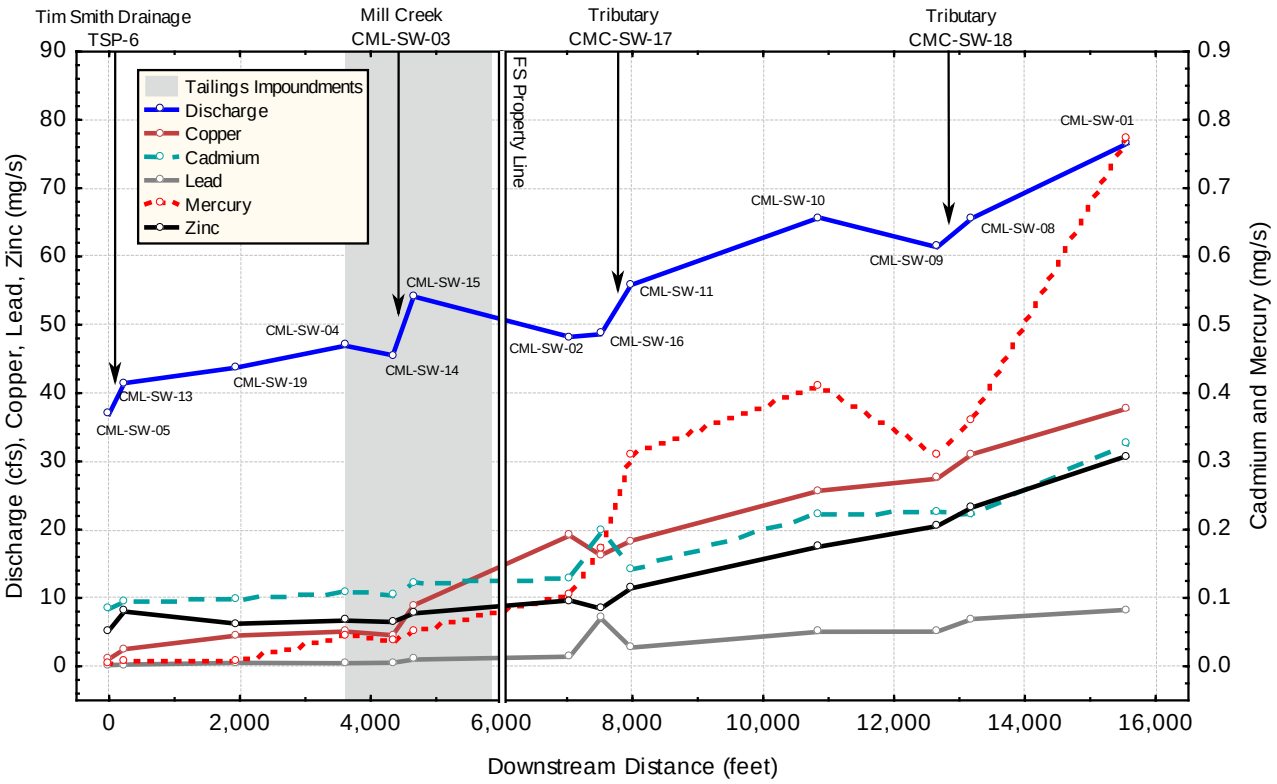


Figure 3-6. South Fork Lower Willow Creek Synoptic Sampling – Discharge and Metals Loading



The results of the synoptic sampling indicate several trends in the data, shown in tabular format in Table 3-30, graphically on Figures 3-5 and 3-6, and spatially on synoptic sampling figures provided in Appendix G, including the following:

- Total recoverable metals concentrations and metals loading rates generally increased from upstream to downstream (Figures 3-5 and 3-6). The largest increase in both metals concentrations and metals loading rates begin at the Combination Mill and continue to increase sharply at sample stations downstream of the Combination Mill on USFS administered lands.

- Using a Mann-Whitney U-Test, a significant increase (P-value less than 0.05) in copper, cadmium, lead, mercury, and zinc concentrations was observed at the eight synoptic sample stations (CML-SW-15 to CML-SW-01) downstream of CML-SW-15 when compared to the five synoptic sample stations upstream of Mill Creek (CML-SW-05 to CML-SW-14).

- Though concentrations were elevated in the Tim Smith Drainage and Mill Creek, concentrations did not have a significant impact on metal loading rates in South Fork Lower Willow Creek. For example, although copper loading rates increased from 4.5

to 9.2 milligrams/second (mg/s) between CML-SW-14 and CML-SW-15 (above and below the confluence of Mill Creek), the surface water input from Mill Creek (CML-SW-03) only accounted for 1.6 mg/s of the copper loading rate (5 percent) based on CML-SW-03 measurements. The minor effects of the Tim Smith Drainage and Mill Creek on metals loading rates in South Fork Lower Willow Creek can be attributed to the low tributary discharge rates relative to South Fork Lower Willow Creek flow.

Based on the data presented above, including the synoptic sampling results, surface and subsurface flows through the Combination Mill tailings impoundment and fluvially deposited tailings in the downstream floodplain likely are responsible for increased metals concentrations and loading rates in South Fork Lower Willow Creek. Evidence supporting this theory includes surface water sample results from the reclaimed tailings impoundment ponds, which appeared to be groundwater fed (no surface water inputs were observed), where the highest antimony, arsenic, cadmium, copper, mercury, silver, and zinc concentrations were observed. Low metals loading rates observed in the Tim Smith Drainage, Mill Creek, and other unnamed tributary streams also support this theory.

Historical metals concentrations (analyzed as dissolved, total, or total recoverable metals) are presented in Table 3-31. Similar to surface water samples at the Tim Smith Mine AOC, trends in the data are difficult to discern due to the low number of sampling events and the high number of non-detect results. Only the five TMDL sites, and sample locations MCSW-1 and WCSW-1 have been sampled more than once. Metals concentrations have remained similar over time at these locations. With the exception of concentrations in the samples (CML-SW-06 and CML-SW-07) collected in the tailings impoundment sediment ponds, metals concentrations detected in RI samples were similar to metals concentrations detected in historical water samples.

The following summarizes comparison of detected metals concentrations in historical and RI samples (Table 3-31). Historical sample locations are shown on Figure 3-7 in Appendix E.

- The highest antimony results were detected in the RI samples collected from CML-SW-06 (117.0 µg/L) and CML-SW-07 (42.90 µg/L). The next highest results have been recorded at the furthest downstream sample location, TMDL site SFLWILLOWC02 (ranging from 10 µg/L to 17 µg/L).

- Similar to antimony, the highest arsenic results were detected in the RI samples collected from CML-SW-06 (36.00 µg/L) and CML-SW-07 (12.80 µg/L). The next highest results were again recorded at the furthest downstream sample location, TMDL site SFLWILLOWC02 (ranging from 5 µg/L to 7 µg/L).

- The highest cadmium concentrations were detected in the May 2009 samples from SFWILLOWC04 (1.94 µg/L) and the upstream sample location, SFLWILLOW05 (1.48 µg/L).

- The highest copper results were detected in the RI samples collected from CML-SW-07 (221.0 µg/L) and CML-SW-06 (133.0 µg/L). Other detected copper concentrations

ranged from 1.0 µg/L in the upstream sample CML-SW-05 to 50 µg/L in the sample collected at BP-3A.

- Six of the 10 highest iron concentrations have been detected in samples collected from Mill Creek, including the June 2001 sample at MCSW-1 (2,150 µg/L), the sample from CML-SW-03 (1,450 µg/L), and the May 2009 sample from SFLWILLOWC04.5 (1,370 µg/L). Other detected iron concentrations ranged from 30.0 µg/L in the sample from 1A, located near SFLWILLOWC05 to 1,430 µg/L in the sample collected from CML-SW-07.

- The highest lead concentration was detected in the sample collected in the north tailings impoundment sediment pond sample location CML-SW-07 (49.0 µg/L). The next two highest detections were in samples collected at the furthest downstream sample locations, SFLWILLOWC02 (30.80 µg/L) and SFLWILLOWC03 (13.60 µg/L) in May 2009.

- The highest manganese concentration was detected in the October 2000 sample at MCSW-1 (120.0 µg/L). Manganese was detected above 50 µg/L in samples collected in 1990 by ASARCO, including BP-1A (55.0 µg/L), and BP-2A (52.0 µg/L). Other detections have ranged from 1.0 µg/L (CML-SW-18) to 39.1 µg/L (CML-SW-06).

- As with antimony and arsenic, the highest mercury results were detected in the RI samples collected from CML-SW-07 (2.52 µg/L) and CML-SW-06 (1.91 µg/L). Other detections have ranged from 0.0042 µg/L (CML-SW-05) to 1.15 µg/L (BP-3A).

- Silver was not analyzed in most of the historical sampling and has only been detected in five samples.

- The highest zinc concentrations were detected in the RI samples collected at CML-SW-06 (63.10 µg/L) and CML-SW-07 (40.50 µg/L). Other detected concentrations have ranged from 6.10 µg/L (CML-SW-16) to 40 µg/L in the 1981 baseline sample 22.

3.6.3 Hazardous Materials Inventory Sampling Summary

Three buildings were identified as physical hazards at the Combination Mill AOC. Two mill sites, the "Old Mill" and Combination Mill, are in varying states of deterioration. The wooden pump house next to South Fork Lower Willow Creek is in decent condition and does not pose a notable threat.

3.6.3.1 Suspect Asbestos-Containing Materials

A total of four samples were collected from four unique, suspect building materials identified in the three buildings/structures located in the Combination Mill AOC. Samples were collected

from the small pump house, located adjacent to South Fork Lower Willow Creek, the rubble at the "Old Mill" site, and the rubble at the Combination Mill (Figure 2-11). Asbestos was not detected in the samples collected from suspect materials identified in the Combination Mill AOC.

3.6.3.2 Other Hazardous Building Materials

The three buildings were also inspected for cooling systems with potential CFCs and for fluorescent or HID lights/fixtures. No CFC based cooling systems, or fluorescent or HID lights were observed.

Herrera collected one brick sample (CML-RCRA-01) and one wood sample (CML-RCRA-02) at the "Old Mill" site west of South Fork Lower Willow Creek and one wood sample (CML-RCRA-03) and one brick sample (CML-RCRA-04) from the Combination Mill (Figure 2-11). The samples were obtained by drilling into bricks and multiple scraps of wood at each mill location. The drill cuttings from each sample type were composited at each mill and placed in a Ziploc bag. These destructive samples were analyzed for the eight RCRA metals. The total recoverable metals results are provided in Table 3-32. The complete analytical results are provided in Appendix B-10.

Based on the total recoverable metals results, sufficient concentrations of arsenic, lead, and mercury may be available to leach from the wood and bricks sampled to exceed toxicity characteristic regulatory limits. Total metals or total recoverable metals analysis may be used to estimate whether or not a waste may exceed the toxicity characteristic regulatory limits through the Rule of 20 also known as the 20 Times Rule. The toxicity characteristic of a waste is determined through the Toxicity Characteristic Leaching Procedure (TCLP). The TCLP procedure includes diluting the waste in a volume of extraction fluid equal to 20 times the weight of the sample. Based on this dilution ration, total metals results would need to exceed the toxicity characteristic regulatory limit by 20 times the limit for there to be a possibility of the material exceeding this limit when the TCLP analysis is performed (Kansas SBEAP, 2001). A total metals result less than 20 times the toxicity characteristic regulatory limit indicates the waste is not a hazardous waste for the specific metal analyzed. A total metals result greater than 20 times the toxicity characteristic regulatory limit does not classify the waste as hazardous, but does indicate that the waste may be classified as hazardous. TCLP analysis should be performed on wastes that exceed 20 times the toxicity characteristic regulatory limit.

- The detected arsenic concentration in sample CML-RCRA-02 (680 mg/kg) and sample CML-RCRA-04 (138 mg.kg) were both more than 20 times the toxicity characteristic regulatory limit for arsenic (5.0 milligrams per liter [mg/L]). Sample CML-RCRA-02 was collected from wood cuttings at the "Old Mill" site, while sample CML-RCRA-04 was collected from brick cuttings at the Combination Mill site.

- The detected lead level in each of the samples was higher than 20 times toxicity characteristic regulatory limit (5.0 mg/L). The detected lead concentration in the samples were:
  - CML-RCRA-01 (brick cuttings from the "Old Mill: site): 164 mg/L
  - CML-RCRA-02: 2,640 mg/L
  - CML-RCRA-03 (wood cuttings at the Combination Mill site): 151 mg/L
  - CML-RCRA-04: 222 mg/L

The detected total recoverable metals lead concentration in the sample from CML-RCRA-02 exceeded the toxicity characteristic regulatory limit by more than 500 times.

- The detected mercury concentration in sample CML-RCRA-02 (5.0 mg/kg) and sample CML-RCRA-03 (4.4 mg/kg) were both more than 20 times the toxicity characteristic regulatory limit for mercury (0.2 mg/L).

Based on the total recoverable metals results, samples from the bricks and wood debris at both the "Old Mill" and Combination Mill site should be submitted for TCLP analysis of arsenic, lead, and mercury. Based on the TCLP analysis a final determination of the toxicity characteristic of these materials can be determined.

3.7 Field Quality Assurance/Quality Control Samples

Five quality assurance/quality control (QA/QC) samples were collected during the RI:

- An equipment rinsate blank sample (QC-WT-T1).
- An aqueous field duplicate sample (Field Duplicate) of sample CMMW-1.
- An aqueous field duplicate sample (BD-1) of sample North Area Spring (N).
- An aqueous field duplicate sample (CML-QC-T1) of sample CML-SW-15.
- An aqueous field duplicate sample (CML-QC-T2) of sample CML-SW-02.

The water analyses results for the QA/QC samples are presented in Appendix B-11. The field duplicate metals results are shown in the Table 3-5 (BD-1), Table 3-8 (Field Duplicate), and Table 3-28 (CML-QC-T1 and CML-QC-T2).

The equipment rinsate blank was collected by pouring distilled water over decontaminated drilling equipment, and collecting the water in a sample container. A low detection (0.47 µg/L)

of total recoverable lead was found in the equipment rinsate blank. Since no other quality control samples were prepared for evaluating cross-contamination in the field, this result was assumed to be applicable to the full period of sample collection. A total of 21 data points for total recoverable lead were qualified as JB, indicating an estimated result due to possible contamination occurring as a result of field processes, or U, indicating that the result was determined to be a non-detection resulting from the observed contamination from field processes.

Field precision is one criterion for evaluation of data quality. Precision is the measure of variability between sample measurements. Measurements of data precision demonstrate the reproducibility of the analytical data. Evaluation of precision is accomplished using the relative percent difference (RPD) between the field duplicate pairs. The RPD is defined as the difference between the primary and duplicate samples divided by the mean and expressed as a percentage. The upper limit for acceptable field duplicate RPDs in water samples is 30% (EPA 1996a). In cases where both compounds are detected at concentrations less than two times the detection limit the precision goals are not applicable (EPA 1996a). Most field duplicate RPD results were within the data validation QC limits. However, approximately 41 data points (of a total of 702 data points that are associated with these field duplicate sample pairs) were qualified as J or UJ as a result of field duplicate RPD values that were outside the data validation QC limits. Based on the evaluation, the data are acceptable for use in site characterization. Additional discussion of the data quality is provided in the Executive Summary, Reclamation Investigation Report Data Validation and detailed in individual data validation reports, which are included in Appendix D.

4.0 Reclamation and Land Use Characterization Results

Physical and agronomic tests were performed on topsoil (the topsoil layer varied in thickness from non-existent to 10 inches) and shallow subsurface (less than four feet bgs) samples collected from repository test pit locations to evaluate suitability for reuse as topsoil during site reclamation. Physical tests were performed on five topsoil samples and two shallow subsurface samples. Agronomic tests were performed on six topsoil samples and four shallow subsurface samples.

4.1 Physical Analyses

Physical analyses were included texture and moisture content. Moisture content is the ratio of the weight of water compared to the weight of solids. Moisture content of the samples is discussed further in Section 7. Texture is the relative proportions of the various soil separates (sand, silt, and clay) in soil. The USDA textural classification is based on the fine-grained portion of the soils and removes the coarse-grained portion, larger than 2 millimeters (mm), of the soils. The percentages of sand, silt, and clay shown in Table 4-1 are different from the percentages based on USCS, which are shown in Table 7-6, because the coarse-grained portion is removed under the USDA classification, but not under the USCS classification. As shown in Table 7-6, the gravel portion for these samples ranges from 57.0% to 85.9% of the overall sample volume. This shows that coarse-grained soils make up the majority of the material in the surface soil samples. More complete particle size distribution information based on the USCS and other geotechnical test results are presented in Section 7. A summary of the physical analyses is shown in Table 4-1. Laboratory reports for the physical analyses can be found in Appendix H.

Table 4-1. USDA Surface Soil / Topsoil Classification Test Results

Location	Depth (ft)	Grain Size Distribution [a]			Natural moisture content, % [b]	USDA Classification [c]
		% Sand	% Silt	% Clay		
RY-SS-01	0-1.3	39.8	47.3	12.9	4.0	Loam
RY-SS-01	1.3-2.7	62.5	31.2	6.3	2.7	Sandy loam
RY-SS-02	0-0.5	38.1	54.9	7.0	4.3	Silt loam
RY-SS-02	0.5-2.7	32.1	57.7	10.2	6.8	Silt loam
RY-SS-03	0-1.5	30.6	60	9.4	3.8	Silt loam
RY-SS-04	0-1.5	55.9	36.4	7.7	7.5	Sandy loam
RY-SS-05	0.5 – 1.5	40.2	54.4	5.4	4.2	Silt loam

[a] Percent by weight, fractions normalized to 100% passing the #10 (2mm) sieve.
[b] Weight of water as a percentage of the weight of solids.
[c] USDA classifications do not account for the oversized material (coarse sand, gravel, and cobbles) screened from the sample. These classifications are of the fine-grained soils only.
ft: feet

4.2 Agricultural Analyses

Agricultural analyses performed on the proposed repository topsoil and shallow subsurface samples collected from test pits and soil borings included pH, conductivity, cation exchange capacity, nitrate, phosphorous, potassium, percent organic matter, and lime requirements. Results are shown in Table 4-2 and laboratory reports are provided in Appendix C. ABA results for repository samples are discussed in Section 7.4.1. The following provides a summary of the agricultural analyses and a discussion on how the soil characteristics may affect current and future plant growth:

- pH is the measure of the acidity/alkalinity of soils and is important because it influences many other soil chemical properties. Neutral pH ranges from 6.6 to 7.3 standard units (s.u.) (Munshower 1993). The pH of the ten repository cover soil samples ranged from 5.8 to 7.8. The soils range from moderately acid to slightly alkaline. These soils will provide a foundation for plant establishment.

- Conductivity measures the salinity of soil. High conductivity concentrations may indicate when soil conditions could either limit existing plant growth or impede revegetation. The conductivity of the soils ranged from 0.10 to 0.33 millimhos per centimeter (mmhos/cm), which is within a suitable range for establishing vegetation (Bohn 1979).

- Cation exchange capacity (CEC) is the expression of cation adsorption per unit weight of soil. Cation exchange is the relationship between cations attracted to and absorbed on soil colloids at negatively charged sites. Soils can become acidic when the rate of hydrogen ions accumulation is greater than the rate of hydrogen ion removal. Samples at the site had a CEC ranging from 11.2 to 49.8 milliequivalents per 100 grams (meq/100 g). The samples were classified as loams, which places the CEC in the medium to high range (Munshower 1993).

- Nitrogen and nitrogen forms such as nitrate and nitrite are essential nutrients for establishing and maintaining vegetative cover. The nitrate levels in the soil samples were not detected (less than 5.0 mg/kg). With low levels of nitrogen available, applying an organic nitrogen amendment in a slow release form may be appropriate during revegetation.

- Phosphorus is a key nutrient for maintaining existing vegetation and establishing new vegetation. Phosphorus as the phosphate ion is especially important during seedling growth (Munshower 1993). Phosphorus/phosphate levels ranged from non-detect (less than 1.0 mg/kg) to 22 mg/kg in the samples, which is in the low to medium range for phosphorus/phosphate. The existing levels should support revegetation.

- Potassium is another essential nutrient that facilitates vegetative growth. The potassium levels in the soil ranged from non-detect (less than 118 mg/kg) to 294

mg/kg. Soils containing potassium at or above 120 mg/kg will typically support vegetation (USDA 2009). The levels noted at the site should support revegetation.

- Organic matter stores anions, buffers the soil against rapid changes due to acidity or alkalinity, and increases the water-storage capacity of the soil. The organic matter ranged from 5.2 to 8.9%, with the exception of the sample from CML-SS-11 (0.81%). Except for the organic result for CML-SS-11, the organic results are in the high range (Munshower 1993). The existing organic matter likely would support revegetation.

- Natural lime in soils will buffer or neutralize acid-producing elements found in mine waste while facilitating plant uptake of nitrogen. SMP buffer pH results range from 7.0 to 5.8 s.u. Based on the near neutral soil SMP buffer pHs found at the proposed repository locations and the plants that will be selected for revegetation, lime amendment likely would not be needed to support vegetation on the cover soil.

After analyzing the agricultural results from the samples collected at the proposed repository sites, Herrera would preliminarily recommend that 25 to 30 pounds of nitrate be added per acre, based on a grass crop with a projected yield of 1.5 tons (Jacobsen et al. 2005). Fertilizer calculations are provided in Appendix I.

5.0 Human Health Risk Assessment

Previous site assessments at the BPM indicated the presence of contaminants with a potential to harm recreational users. Based on the findings from these previous assessments, performing a human health risk assessment was deemed appropriate, and included as part of the RI. The human health risk assessment, detailed below, identified human health risks at the BPM, identified contaminants of concern (COC), and determined the associated clean-up goals for reclamation.

This risk assessment contains the following sections: 1) hazard identification; 2) exposure assessment; 3) toxicity assessment; 4) risk characterization; and 5) risk-based clean-up goals.

Guidance for this risk assessment was obtained from several documents written by federal and state regulatory agencies, including the EPA and DEQ:

- *Risk Assessment Guidance for Superfund, Volume I, Human Health Evaluation Manual (RAGS)*, Document EPA/540/R/99/005; accessible at: http://www.epa.gov/oswer/riskassessment/ragsa/index.htm (EPA 2004a)

- *Risk-Based Clean-Up Guidelines for Abandoned Mine Sites*, Final Report for the Montana Department of Environmental Quality (DEQ RBCG) (DEQ 1996)

- *Circular DEQ-7 Montana Numeric Water Quality Standards (WQB-7)*, Montana Department of Environmental Quality- Water Quality Standards Section; accessed at: http://deq.mt.gov/wqinfo/standards/default.mcpx (DEQ 2010)

- Montana DEQ's Recreational Risk Assessment Spreadsheet for Abandoned Mine Sites.

The four AOCs are spatially separated across the BPM. The main risk assessment addresses the combined AOCs using exposure and risk calculations; however, risk results for each individual AOC are presented in Section 5.2, Risk Characterization for comparison purposes.

5.1 Hazard Identification

Contaminants of Potential Concern (COPCs) for the BPM were determined by comparing each inorganic chemical (heavy metals) identified at the site to criteria set by the EPA in their Risk Assessment Guidance for Superfund (RAGS) (EPA 2004a). EPA criteria for COPCs include:

- The contaminant is present at the site

- The contaminant has a concentration significantly above background levels (generally 3 times higher)

- The measured concentration of the contaminant is at least 20% greater than the detection limit

- Analytical results have acceptable QA/QC results.

COPC designation also included screening the Recreational Clean-up Guidelines for soil and water (Tables 7-10 and 7-11 in DEQ RBCG) and the Water Quality Standards set by the DEQ, Circular DEQ-7 (DEQ 1996 and DEQ 2010).

5.1.1 Solid-Matrix Samples

Analytical results for total recoverable metals were used to determine COPCs. Solid matrix sample results from the entire BPM (soil, sediment, tailings, and waste rock) were compared to the aforementioned criteria and the listed cleanup guidelines for soils (refer to Table 1 in Appendix J for more details on the COPC determination process). Based on this comparison, 10 COPCs were identified. Six metals concentrations were greater than DEQ RBCGs for recreational visitors and are indicated in bold. Cobalt was analyzed but did not have concentrations above background levels and were below the DEQ RBCGs; therefore, cobalt was not included as a COPC.

- **Antimony**

- **Arsenic**

- **Cadmium**

- **Copper**

- Iron

- **Lead**

- **Manganese**

- Mercury

- Silver

- Zinc

5.1.2 Water-Matrix Samples

Analytical results for water samples collected from the BPM were compared to the EPA criteria, the listed clean-up guidelines for water, and Circular DEQ-7 water quality standards (EPA 2004a, DEQ 1996, and DEQ 2010). Water samples were collected from South Fork Lower Willow Creek and two of its tributaries (Tim Smith Drainage and Mill Creek) each of which flow through one or more of the AOCs. Analytical results for samples collected from seeps at Combination Mine AOC were not considered in the COPC determination process, per the DEQ Recreational Risk Assessment Spreadsheets for Abandoned Mine Sites (refer to Table 2 in Appendix J for more details on the COPC determination process). Based on these comparisons, 12 COPCs were identified. Concentrations of five of these COPCs exceeded the HHS for Surface Water, Circular DEQ-7, and/or the Montana Numeric Water Quality Standards (antimony, arsenic, lead, manganese, and mercury); concentrations of six of these COPCs exceeded DEQ RBCGs for recreational visitors and are indicated in bold.

- **Antimony**
- **Arsenic**
- Cadmium
- Chromium III
- Copper
- Iron
- **Lead**
- **Manganese**
- **Mercury**
- Nickel
- Silver
- **Zinc**

5.1.3 Exposure Assessment

The exposure assessment identifies potential human receptors, exposure routes through which receptors may come into contact with COPCs, the exposure parameters, and the COPC concentrations used to quantify exposure.

The gold panner/rock hound was selected as the primary exposure scenario for recreation use at the BPM. Fish consumption was also considered because the South Fork Lower Willow Creek flows through the Combination Mill Site, exposing native fish to contaminants and therefore, exposing anglers fishing from this creek. DEQ RBCG lists an angler recreational use of 3,314 total days for the South Fork Lower Willow Creek (DEQ 1996). Although hunting and all-terrain vehicle (ATV) recreational use are probable at the BPM, the gold panner/rock hound scenario was chosen because this scenario is the most conservative scenario in the DEQ RBCG and most protective of human health (DEQ 1996). The gold panner/rock hound recreational scenario considers exposures to soil, sediments, and water for a 50-day period versus six or 42 exposure days for other scenarios. The scenario also considers adult and child exposures versus only adult exposures in the other scenarios. The only exposure that the gold panner/rock hound does not consider is fish consumption; therefore, the fisherman scenario was also chosen for exposure to COPCs through fish consumption. Inhalation exposure was determined using solid matrix concentrations in samples collected from the site; with the exposure calculation modified for particulate inhalation (air monitoring data were not collected). The exposure routes and associated exposure parameters used in this risk assessment include:

- Incidental soil ingestion (gold panner/rock hound – adult and child)
- Dermal exposure to soil (gold panner/rock hound – adult and child)
- Inhalation of particulate matter (gold panner/rock hound – adult and child)
- Incidental water ingestion (gold panner/rock hound – adult and child)
- Dermal contact with water (gold panner/rock hound – adult and child)
- Incidental sediment ingestion (gold panner/rock hound – adult and child)
- Fish ingestion (fisherman – adult)

Conservative exposure parameters from the DEQ RBCG were used in this risk assessment as the actual exposure parameters and time spent at the site by recreational users is unknown. This decision was also based on the fact that the South Fork Lower Willow Creek has the potential to provide trout habitat. The conservative fish consumption exposure pathway option listed in the DEQ RBCG (DEQ 1996) of 42 meals per year was used in the exposure calculations. For the gold panner/rock hound scenario, the exposure frequency of 50 days per year was used in the associated exposure calculations (DEQ 1996).

Both EPA RAGS (2004b) and the DEQ RBCG (DEQ 1996) guidance recommend utilizing the 95th UCL of the arithmetic mean concentration for each COPC as the exposure point concentration (EPC) for that COPC within a media. However, if this statistic cannot be calculated based on sample size (i.e., the distribution is not normalized, n < 30), the arithmetic mean of the COPC concentrations found at the site should be used. The maximum concentration is only to be used if the sample size is limited. A total of 26 solid matrix surface samples, which are appropriate for risk calculations using the chosen exposure scenarios were collected from the BPM and used in this risk assessment, including 13 soil, 3 waste rock, and 10 tailings samples. In addition, 19 water samples, 11 seep discharge samples, and 47 sediment samples were collected from locations at the BPM and deemed practical for use in the risk assessment application.

In accordance with guidance for gold panner/rock hound and fish consumption exposures associated with water (ingestion and dermal exposure to water, ingestion of sediments, and ingestion of fish), the maximum COPC concentration was used for the specific COPC EPC in these calculations (DEQ 1996). The arithmetic mean of the soil COPC concentrations from the area with the highest magnitude of tailings (sample results from the Combination Mill AOC) were used for the specific COPC EPC in exposure calculations related to soils exposures (DEQ 1996). For one case, the arithmetic mean of manganese in waste rock at the Combination Mine AOC was greater than the arithmetic mean for manganese in tailings at the Combination Mill AOC; therefore, the greater concentration was used in exposure calculations. Media-specific EPCs for each COPC used in exposure calculations are provided in Table 5-1. Uncertainties associated with using the maximum/median concentration versus the 95th UCL of the COPC arithmetic mean are outlined in Section 5.2.3.

Table 5-1. Contaminants of Potential Concern (COPCs) Exposure Point Concentrations (EPCs) for each Media used in Exposure Calculations (includes all four AOCs)

COPCs	Solids[a] (mg/kg)	Surface Water[b] (µg/L)	Sediment[c] (mg/kg)
Antimony	876	117	891
Arsenic	786	36.0	642
Cadmium	17.0	1.20	32.5
Chromium III	NA	2.90	NA
Copper	2,553	221	5,320
Iron	23,933	2,990	37,400
Lead	3,573	49.0	4,240
Manganese	773	52.6	2,780
Mercury	26.4	2.52	57.9
Nickel	NA	4.20	NA
Silver	67.8	0.64	213
Zinc	406	63.1	768

[a] Solids include arithmetic mean from tailings concentrations associated with the most concentrated tailings area at the BPM (the Combination Mill AOC) or the arithmetic mean from waste rock concentrations from the most concentrated waste rock area (the Combination Mine AOC)
[b] Water EPCs include maximum surface water concentrations for the entire BPM, excluding seep discharge
[c] Sediment EPCs include the maximum sediment concentrations for the entire BPM
mg/kg – milligrams per kilogram
µg/L – micrograms per liter
COPC – contaminant of potential concern
NA – not applicable, the chemical is not a COPC for the associated medium

The individual AOC risk calculations use the maximum COPC concentration from that AOC as the EPC in exposure calculations, due to lack of sample size for each AOC.

Guidance for COPC exposure calculations, exposure pathways, and exposure parameters used in the calculations was obtained from Tables 4-1 and 4-2, and Figure 4-2 in the DEQ RBCG (DEQ 1996). Calculation tables for this risk assessment can be found in Appendix J, Tables 3 through 9.

Exposures for the Estimated Lifetime Cancer Risk (ELCR) incorporate a lifetime exposure duration of 70 years to obtain the lifetime exposure for the given exposure pathway. Guidance for these calculations was provided in DEQ RBCG (DEQ 1996). Calculation tables for this risk assessment can be found in Appendix J, Tables 10 through 13.

5.1.4 Toxicity Assessment

Toxic thresholds used in this risk assessment can be found in Appendix J, Tables 3 through 9. Chronic oral reference dose (RfD) values obtained from EPA's Integrated Risk Information

System (IRIS) for antimony, arsenic, cadmium, chromium (trivalent), manganese, mercury, nickel, silver, and zinc were used as toxic thresholds in this risk assessment. Cadmium and manganese have specific oral RfD values for food consumption (solids and fish) versus water intake; the specific RfD is used accordingly in the Hazard Quotient (HQ) calculations based on the specific exposure (fish consumption vs. surface water consumption). The chronic oral RfD for a specific substance is determined using the equation:

$$RfD = NOAEL \div (UF \times MF)$$

Where: NOAEL is the no observed adverse effects level

UF is an uncertainty factor, ranging from 1 to 1,000

MF is a modifying factor, determined by EPA professional judgment (EPA 1993)

For copper, the oral RfD was obtained from EPA's Health Effects Assessment Summary Tables (HEAST) (EPA 1997a). The RfD and inhalation reference concentration RfC for lead were obtained by back-calculation methods from DEQ RBCG (DEQ 1996). Chronic inhalation RfC values were obtained from IRIS for manganese and mercury. The RfD for iron was obtained from EPA's Provisional Peer Reviewed Toxicity Values (PPRTV) (EPA 2006).

Dermal toxic thresholds were calculated using oral RfD values for each COPC using the Gastrointestinal Absorption percentages (GI ABS %) obtained from RAGS Part E, exhibit 4-1 (EPA 2004a). The following equation was used to determine the dermal RfD:

$$\text{Dermal RfD} = \text{Oral RfD} \times \text{GI ABS \%}.$$

When no GI ABS % was available, the oral RfD was extrapolated to the dermal RfD. GI ABS % were available for antimony, cadmium, chromium, manganese, nickel, and silver.

Cancer Slope Factor (SF) values were obtained from EPA's IRIS for arsenic (oral) (EPA 1998) and for cadmium (inhalation) (EPA 1994a) and from California Environmental Protection Agency (CALEPA 2005) for lead (oral). These can be found in Appendix J, Tables 10 through 13.

5.2 Risk Characterization

Risk characterization combines exposure and toxicity evaluations to calculate quantitative carcinogenic risk and non-carcinogenic hazards for the exposure scenario. The following sections detail the quantitative human health risk assessment.

5.2.1 Risk Calculations

A HQ was calculated to compare exposure to toxic thresholds (oral or dermal RfDs or inhalation RfC) for each COPC and exposure route. This HQ helps quantify non-carcinogenic human health hazards for each COPC present on site. The equation used was:

HQ = Exposure ÷ Toxic Threshold Value

The EPA HQ benchmark of 1.0 has been established to protect human health from contaminants. A HQ greater than 1.0 indicates the need for an exposure reduction. More specifically, it denotes an exposure value higher than the given threshold value and designates that specific COPC as a COC for the BPM. HQs for adult and child receptors were calculated for each COPC in each media (solids, sediment, and water), with an exposure duration of 30 years for the gold panner/rock hound recreational scenario (adult exposure duration of 24 years and child exposure duration of 6 years). A HQ for adult fish consumption was also calculated by comparing fish ingestion exposure to the oral RfD for specific COPCs. Calculation tables for this risk assessment can be found in Appendix J, Tables 3 through 9.

HQs were summed across exposures (oral, dermal, and inhalation) for each COPC in each media (solids, water, sediments, and fish). The summed HQs for each COPC were then combined for an overall COPC HQ. The combined HQ represents the total HQ among all COPCs present in solids, sediment, water, and fish for an adult (Table 5-2) and child (Table 5-3). The relative contribution of each individual COPC HQ to the total HQ is also calculated to determine which COPCs are of greater concern.

Table 5-2. Summary of Adult Non-Carcinogenic Hazards through Exposures as a Recreational Gold Panner/Rock Hound

COPC	Solids HQ[a]	Surface Water HQ[b]	Sediment HQ[c]	Fish Consumption HQ[b, d]	Combined HQ[e]	Percent Contribution
Antimony	**2.69E+00**	6.30E-01	**1.05E+00**	5.43E-02	**4.42E+00**	**15.38%**
Arsenic	**2.12E+00**	2.38E-01	**1.01E+00**	9.81E-01	**4.35E+00**	**15.12%**
Cadmium	1.57E-02	6.11E-03	1.53E-02	1.81E-02	5.52E-02	0.19%
Chromium III	NA	8.15E-06	NA	5.75E-06	1.39E-05	0.00%
Copper	3.72E-02	1.10E-02	6.25E-02	2.05E-01	3.16E-01	1.10%
Iron	1.99E-02	8.48E-03	2.51E-02	7.93E-04	5.43E-02	0.19%
Lead	**1.39E+00**	6.40E-02	**1.33E+00**	2.97E-01	**3.08E+00**	**10.71%**
Manganese	1.83E-02	1.01E-03	9.33E-03	3.335E-03	3.20E-02	0.11%
Mercury	8.76E-02	3.11E-02	1.70E-01	**1.61E+01**	**1.64E+01**	**56.96%**
Nickel	NA	4.42E-04	NA	1.83E-03	2.27E-03	0.01%
Silver	4.48E-02	3.07E-04	2.00E-02	2.38E-05	6.51E-02	0.23%
Zinc	7.89E-04	4.15E-04	1.20E-03	1.84E-03	4.24E-03	0.01%
TOTAL HQ	**6.42E+00**	9.91E-01	**3.68E+00**	**1.77E+01**	**2.88E+01**	100%

COCs are in bold (COC is determined by an HQ>1.0

[a] Maximum concentration per COPC of the arithmetic mean of the COPC concentration in tailings from the Combination Mill AOC or waste rock from the Combination Mine AOC used as the EPC in the exposure calculation

[b] Maximum sample point concentration for surface waters, excluding seep discharge used as the EPC in the exposure calculation

[c] Maximum sample point concentration for sediments used as the EPC in the exposure calculation

[d] The more conservative exposure frequency of 42 meals per year used in the fisherman exposure scenario for this exposure pathway

[e] Sum of all exposure routes at the BPM

COC – contaminant of concern

COPC – contaminant of potential concern

HQ – hazard quotient

NA – not applicable, the chemical is not a COPC for the associated medium

Table 5-3. Summary of Child Non-Carcinogenic Hazards through Exposures as a Recreational Gold Panner/Rock Hound

COPC	Solids HQ[a]	Surface Water HQ[b]	Sediment HQ[c]	Combined HQ[e]	Percent Contribution
Antimony	**4.40E+00**	**2.75E+00**	**2.03E+00**	**9.19E+00**	**40.60%**
Arsenic	**3.68E+00**	**1.10E+00**	**1.95E+00**	**6.74E+00**	**29.79%**
Cadmium	2.67E-02	2.39E-02	2.97E-02	8.03E-02	0.35%
Chromium III	NA	2.38E-05	NA	2.38E-05	0.00%
Copper	6.88E-02	5.07E-02	1.21E-01	2.41E-01	1.06%
Iron	3.68E-02	3.92E-02	4.88E-02	1.25E-01	0.55%
Lead	**2.57E+00**	2.98E-01	**2.58E+00**	**5.45E+00**	**24.08%**
Manganese	2.79E-02	3.82E-03	1.81E-02	4.99E-02	0.22%
Mercury	1.65E-01	1.44E-01	3.30E-01	6.40E-01	2.83%
Nickel	NA	1.96E-03	NA	1.96E-03	0.01%
Silver	6.81E-02	1.25E-03	3.89E-02	1.08E-01	0.48%
Zinc	1.46E-03	1.93E-03	2.34E-03	5.72E-03	0.03%
TOTAL HQ	1.10E+01	4.42E+00	7.16E+00	**2.26E+01**	100%

COCs are in bold (COC is determined by an HQ>1.0)
[a] Maximum concentration per COPC of the arithmetic mean of the COPC concentration in tailings from the Combination Mill AOC or waste rock from the Combination Mine AOC used as the EPC in the exposure calculation
[b] Maximum sample point concentration for surface waters, excluding seep discharge used as the EPC in the exposure calculation
[c] Maximum sample point concentration for sediments used as the EPC in the exposure calculation
[d] The more conservative exposure frequency of 42 meals per year used in the fisherman exposure scenario for this exposure pathway
[e] Sum of all exposure routes at the BPM
COC – contaminant of concern
COPC – contaminant of potential concern
HQ – hazard quotient
NA – not applicable, the chemical is not a COPC for the associated medium

Antimony, arsenic, and lead are COCs at the BPM with a potential risk to create non-carcinogenic health effects for the recreational gold panner/rock hound recreationalist. Mercury is a COC for the recreational fisherman consuming fish from South Fork Lower Willow Creek. The adult antimony combined HQ was 4.42 and the child antimony combined HQ was 9.19, contributing 15% and 41% of the total combined HQ, respectively. The adult arsenic combined HQ was 4.35 and the child arsenic combined HQ was 6.74, contributing 15% and 30% of the total combined HQ, respectively. The adult lead combined HQ was 3.08 and the child lead combined HQ was 5.45, contributing 11% and 24% of the total combined HQ, respectively. The adult HQ for mercury from fish consumption was 16.4. The total adult HQ for all COPCs was 28.8 and the total child HQ for all COPCs was 22.6. The majority of the antimony, arsenic, and lead adult exposure results from accidental ingestion and contact with tailings, waste rock, and soil, in addition to accidental ingestion of sediments. The majority of the antimony, arsenic, and lead child exposure results from accidental ingestion and contact with tailings, waste rock, and soil, accidental ingestion of sediments, and accidental ingestion of surface water for antimony and arsenic.

Carcinogenic exposures for arsenic, cadmium, and lead were calculated in the same manner as the non-carcinogenic exposure, except the average time of the pathway-specific exposure period was adjusted to 365 days for 70 years (lifetime).

The ELCR was calculated for arsenic, cadmium, and lead using the following equation:

ELCR = Slope Factor × Lifetime Exposure

EPA considers an ELCR greater than 1.0E-06 as unacceptable (EPA 2004a). This benchmark indicates that one person in a population of 1,000,000 will be at risk for developing cancer from the given COPC. ELCRs were determined for both adult and child, and then exposures were combined for a true lifetime estimated cancer risk. Calculations tables for ELCRs can be found in Appendix J, Tables 10 through 13.

Combined adult and child ELCRs for each COPC from each media are summed across exposure pathways for a total media ELCR and then combined for a total COPC ELCR (Table 5-4).

Table 5-4. Summary of the Combined Adult and Child Carcinogenic Risk from Exposures as a Recreational Gold Panner/Rock Hound

Carcinogen COPC	Solids ELCR[a, d]	Surface Water ELCR[b, d]	Sediment ELCR[c, d]	Fish Consumption ELCR[b, e]	Combined ELCR[f]	Percentage of ELCR
Arsenic	**4.70E-04**	**7.92E-05**	**2.30E-04**	**6.15E-04**	**1.39E-03**	**92.26%**
Cadmium	6.83E-14	NA	NA	NA	6.83E-14	0.00%
Lead	**8.88E-06**	3.26E-07	**8.62E-06**	**9.91E-05**	**1.17E-04**	**7.74%**
TOTAL ELCR	4.79E-04	7.96E-05	2.39E-04	7.14E-04	**1.51E-03**	100%

ELCRs for fish consumption only consider adult exposure
COCs are in bold (COC is determined by an ELCR>1.0E-06)
[a] Maximum concentration of the arithmetic mean of the COPC concentration in tailings from the Combination Mill AOC or waste rock from the Combination Mine AOC used as the EPC in the exposure calculation
[b] Maximum sample point concentration for surface waters, excluding seep discharge, used as the EPC in the exposure calculation
[c] Maximum sample point concentration for sediments used as the EPC in the exposure calculation
[d] Combined adult and child estimated lifetime cancer risk across all specific media exposure pathways
[e] Adult exposure only used in the fish ingestion ELCR
[f] The sum of all exposure pathways at the BPM
COC – contaminant of concern
COPC – contaminant of potential concern
ELCR - Estimated Lifetime Cancer Risk
NA - not applicable (inhalation route not appropriate for associated media and exposure scenario)

Human exposures to arsenic and lead create potential cancer risks to recreational users at BPM. Estimated lifetime cancer risk from exposures to arsenic and lead are 1.39E-03 and 1.17E-04, respectively, applicable to all exposure routes for a recreationalist, except the gold panner/rock hound exposures to lead through accidental water ingestion. The arsenic ELCR indicates an

estimated one to two persons in every 1,000 would be at risk for developing cancer from arsenic exposure through recreational activities at the site. The lead ELCR indicates an estimated one to two persons in every 10,000 would be at risk for developing cancer from lead exposure through recreational activities at the site. Arsenic and lead are COCs at the BPM with concentrations creating potential risks of non-carcinogenic and carcinogenic human health effects.

To be able to compare human health hazards present at the individual AOCs, risk calculations were completed using the maximum COPC concentration from sample results taken at each AOC for each media. Only adult exposures were considered for comparison purposes. The results for non-carcinogenic health hazards for solid and surface water exposures are shown in Tables 5-5 and 5-6; the results for carcinogenic health hazards for solid and surface water exposures are shown in Tables 5-7 and 5-8. COC`s associated with surface waters at the BPM are based on child HQs, fish consumption HQs, or ELCRs.

Table 5-5. Adult Non-Carcinogenic Hazard through Soil, Waste Rock, or Tailings Exposures as a Recreational Gold Panner/Rock Hound for the Four AOCs

COPCs	Combination Mill AOC HQs[a]	Combination Mine AOC HQs[a]	Historic Mine AOC HQs[a]	Tim Smith Mine AOC HQs[a]
Antimony	**9.84E+00**	**3.10E+00**	**3.56E+00**	NA
Arsenic	**6.59E+00**	**1.45E+00**	**3.08E+00**	NA
Cadmium	4.54E-02	6.19E-02	1.05E-02	NA
Copper	9.67E-02	8.28E-01	3.03E-02	NA
Iron	4.37E-02	1.13E-02	4.47E-02	NA
Lead	**3.70E+00**	7.35E-01	**1.91E+00**	NA
Manganese	1.47E-02	2.77E-02	3.32E-02	NA
Mercury	7.12E-01	4.64E-03	4.31E-02	NA
Silver	1.11E-01	6.95E-02	9.52E-02	NA
Zinc	2.16E-03	8.51E-03	6.34E-04	NA
Total HQ	**2.12E+01**	**6.28E+00**	**8.80E+00**	0.00E+00

COCs are in bold (COC is determined by an HQ>1.0)
[a] Maximum sample point concentration for soils, waste rock, or tailings used as the EPC in the exposure calculation
AOC – Area of Concern
COC – contaminant of concern
COPC – contaminant of potential concern
HQ – hazard quotient
NA - not applicable (no surface soil samples were collected at Tim Smith Mine)

Table 5-6. Adult Non-Carcinogenic Hazard through Surface Water Exposures as a Recreational Gold Panner/Rock Hound for the Four AOCs

COPCs	Combination Mill AOC HQs[a, b]	Combination Mine AOC HQs[a, b]	Historic Mine AOC HQs[a]	Tim Smith Mine AOC HQs[a]
Antimony	6.30E-01	ND	1.02E-02	6.46E-03
Arsenic	2.38E-01	3.62E-01	1.52E-02	2.18E-02
Cadmium	6.11E-03	**1.09E+00**	1.32E-03	1.42E-03
Chromium III	3.65E-06	ND	4.21E-06	8.15E-06
Copper	1.10E-02	**1.04E+00**	5.31E-03	1.51E-03
Iron	4.06E-03	1.17E-01	4.11E-03	8.48E-03
Lead	6.40E-02	4.74E-01	3.79E-03	6.92E-03
Manganese	7.52E-04	1.28E-01	2.96E-04	1.01E-03
Mercury	3.11E-02	3.11E-02	1.52E-03	4.15E-04
Nickel	3.37E-04	ND	2.42E-04	4.42E-04
Silver	3.07E-04	ND	ND	ND
Zinc	4.15E-04	1.34E-01	2.07E-04	1.47E-04
Total HQ	9.86E-01	**3.38E+00**	4.23E-02	4.87E-02

COCs are in bold (COC is determined by an HQ>1)
The only water features present at the Combination Mine AOC are seeps
[a] Maximum sample point concentration for surface waters, excluding seep discharge as the EPC in the exposure calculation
[b] Combination Mill AOC includes the samples collected downstream of the mill, the only surface waters present at the Combination Mine AOC are seeps
AOC – Area of Concern
COC – contaminant of concern
COPC – contaminant of potential concern
HQ – hazard quotient
ND - COPC not detected in sample analysis

Table 5-7. Summary of the Combined Adult and Child Carcinogenic Risk through Soil, Waste Rock, or Tailings Exposures as a Recreational Gold Panner/Rock Hound for the Four AOCs

COPCs	Combination Mill AOC ELCRs[a]	Combination Mine AOC ELCRs[a]	Historic Mine AOC ELCRs[a]	Tim Smith Mine AOC ELCRs[a]
Arsenic	**1.46E-03**	**2.24E-04**	**6.81E-04**	NA
Lead	**2.37E-05**	**3.21E-06**	**1.22E-05**	NA

COCs determined in this risk assessment or ELCRs>1.0E-06 are in bold
[a] Maximum sample point concentration for soils, waste rock, or tailings used as the EPC in the exposure calculation
AOC – Area of Concern
COC – contaminant of concern
COPC – contaminant of potential concern
ELCR - Estimated Lifetime Cancer Risk
NA - not applicable (no surface soil samples collected at Tim Smith Mine AOC)

Table 5-8. Summary of the Combined Adult and Child Carcinogenic Risk through Surface Water Exposures as a Recreational Gold Panner/Rock Hound for the Four AOCs

COPC	Combination Mill AOC ELCRs[a]	Combination Mine AOC ELCRs[a,]	Historic Mine AOC ELCRs[a]	Tim Smith Mine AOC ELCRs[a]
Arsenic	**7.92E-05**	**1.20E-04**	**5.06E-06**	**7.26E-06**
Lead	3.26E-07	**2.42E-06**	1.93E-08	3.53E-08

COCs determined in this risk assessment or ELCRs>1.0E-06 are in bold.
The only water features present at the Combination Mine AOC are seeps.
[a] Maximum sample point concentration for surface waters, excluding seep discharge as the EPC in the exposure calculation
AOC – Area of Concern
COC – contaminant of concern
COPC – contaminant of potential concern
ELCR - Estimated Lifetime Cancer Risk

The contaminants of concern (COCs) for soil and sediments at the BPM are antimony, arsenic, and lead. The COCs for water, excluding seeps, at the BPM are antimony, arsenic, lead, and mercury. Arsenic and lead are COCs that have the potential to cause non-carcinogenic and carcinogenic health risks.

5.2.2 Risk-Based Clean-up Goals

Risk-based clean-up goals are only presented for those COCs that exceeded the non-carcinogenic HQ greater than one or the estimated carcinogenic risk value greater than 1.0 E-06. The risk-based clean-up goals for the BPM were derived from Tables 7-10 and 7-11 in the DEQ RBCG (DEQ 1996). The proposed cleanup goals attempt to reduce the risk of cancer to less than 1.0 E-06 and the non-carcinogenic health hazard quotient to less than one. The cleanup guidelines for antimony in soil are 293.0 mg/kg and 91.1 µg/L for surface water. For reference, the maximum concentrations from the background samples for antimony from undisturbed areas around the BPM are 158 mg/kg for soil and <0.0005 µg/L for surface water. The clean-up guidelines for lead are 1,100 mg/kg for soil and 47.1 µg/L for surface water. For reference, the maximum background concentrations for lead are 1,030 mg/kg for soil and non-detected for surface water. The clean-up guideline for mercury is 0.15 µg/L for surface water, with an average background concentration at BPM of 0.0042 µg/L. Because the background samples for antimony, lead, and mercury are less than the RBCG, the RBCG shall be used for each.

DEQ risk-based-clean-up guidelines for arsenic are 0.7 mg/kg for soil and 0.06 µg/L for surface water. At the BPM, the arithmetic mean background soil concentration is 32 times the soil cleanup guideline level, indicating a relatively high naturally occurring concentration of arsenic in the vicinity. DEQ RBCG allows for use of the 95th UCL on the mean concentration from background soil as an alternative cleanup concentration (DEQ 1996). DEQ RBCG states that health protective levels may be assumed if the maximum contaminant level (MCL) for arsenic is set as the water reclamation goal. Using the aforementioned information for antimony, arsenic, lead, and mercury, Table 5-9 summarizes the associated cleanup guidelines.

Table 5-9. Risk-Based Clean-up Guidelines for Recreational Users at the Black Pine Mine

COC	Soil Cleanup Guideline (mg/kg)	Surface Water Cleanup Guideline (µg/L)
Antimony	293	91.1
Arsenic	40.4[a]	10[b]
Lead	1,100	47.1
Mercury	NA	0.15

[a] UCL = 95th Upper confidence limit on the arithmetic mean background concentration, from background samples
[b] MCL = State of Montana Circular DEQ-7 drinking water standard, maximum contaminant level (DEQ 2010)
COC – contaminant of concern
mg/kg – milligrams per kilogram
µg/L – micrograms per liter
NA - not applicable

5.2.3 Uncertainty Assessment

Uncertainty in this human health risk assessment is potentially associated with the use of mean concentrations in a given media, based on the small number of water samples collected. RAGS (EPA 2004a) and DEQ RBCG (DEQ 1996) guidance documents recommend using the COPC 95th UCL of the arithmetic mean for each medium analyzed in a site specific risk assessment, but this is only suggested if the distribution of the sample is normalized, usually with a sample size greater than 30. In addition, EPA indicates that using the maximum concentration can result in an over-estimate of the human health recreational risk. A conservative approach was used in this case to account for recreational users at and below the BPM and to address tailings washed downstream in South Fork Lower Willow Creek.

Uncertainty also can be attributed to the dermal toxic thresholds extrapolated from the oral RfD, as this is not an accurate representation of the exposure route; however, this represents the best available option for calculating risk. In addition, back calculations are not a reliable method for determining toxic thresholds for lead as the concentration of lead considered to be "safe" has not yet been determined (EPA 2004a).

There is also uncertainty associated with inhalation exposures calculated that relied on soil concentrations instead of air particulate concentrations (no air monitoring was performed).

5.2.4 Risk Characterization Summary

This risk assessment for the four AOCs at the BPM reveals total HQs of 28.8 for adults (includes fish consumption) and 22.6 for children, indicating the potential for adverse health effects among recreational users. COCs include antimony, arsenic, and lead present in tailings, waste rock, soils, and sediments. COCs include antimony, arsenic, lead, and mercury present in surface waters at or affected by the BPM. Arsenic is a COC with the potential to cause non-carcinogenic and carcinogenic health risks associated with all exposure pathways and media analyzed in this

risk assessment for recreational users exposed to soil, tailings, waste rock, surface waters, sediment, and fish. Lead is a COC with the potential to cause non-carcinogenic and carcinogenic health risks associated with exposure pathways and media analyzed in this risk assessment for recreational users exposed to soil, tailings, waste rock, sediments, and fish. Due to the level of these toxic substances present at the BPM, corrective measures to reduce human health risks and hazards are recommended. Reclamation should focus on reducing the COC concentrations in human exposure pathways associated with soil, tailings, waste rock, sediments, and surface waters.

6.0 Ecological Risk Assessment

This ecological risk assessment identifies COCs and presents estimated risks to ecological receptors in aquatic life, terrestrial plant, and terrestrial wildlife communities at the BPM. This risk assessment contains the following sections: 1) hazard identification of ecological threats and habitats, 2) exposure assessment, 3) ecological effects assessment (toxicity assessment), and 4) risk characterization.

Guidance for this risk assessment was obtained from several documents written by federal and state regulatory agencies, including the EPA and DEQ:

- *Ecological Risk Assessment Guidance for Superfund: Process for Designing and Conducting Ecological Risk Assessments*, Document EPA 540-R-97-006 last; accessible at: http://www.epa.gov/oswer/riskassessment/ecorisk/ecorisk.htm (EPA 1997b)

- *Risk Assessment Guidance for Superfund, Volume II, Environmental Evaluation Manual*, Interim Final (RAGS), Document EPA/540/1-89/001; accessible at: http://nepis.epa.gov/Adobe/PDF/10001FP2.PDF (EPA 1989)

- *Risk-Based Clean-Up Guidelines for Abandoned Mine Sites*, Final Report for the Montana Department of Environmental Quality (DEQ RBCG) (DEQ 1996)

- *Estimating Exposure of Terrestrial Wildlife to Contaminants*, Draft (Sample, B.E. and G.W. Suter II; Document ES/ER/TM-125; Prepared for U.S. Department of Energy, Office of Environmental Restoration and Waste Management by Oak Ridge National Laboratory, Environmental Sciences Division, Oak Ridge, Tennessee;; accessed at: http://www.esd.ornl.gov/programs/ecorisk/documents/tm125.pdf (Sample and Sutter II 1994)

- *Toxicological Benchmarks for Wildlife: 1996 Revision* (Sample, B.E., D.M. Opresko, and G.W. Suter II; Document ES/ER/TM-86/R3; Prepared for U.S. Department of Energy Office of Environmental Management by Oak Ridge National Laboratory, Environmental Sciences Division, Oak Ridge, Tennessee; Accessed at: http://www.esd.ornl.gov/programs/ecorisk/documents/tm86r3.pdf (Sample et al. 1996)

- *Circular DEQ-7 Montana Numeric Water Quality Standards (WQB-7)*, Montana Department of Environmental Quality- Water Quality Standards Section; accessed at: http://deq.mt.gov/wqinfo/standards/default.mcpx (DEQ 2010)

- Montana Department of Environmental Quality's Ecological Risk Assessment Spreadsheet for Abandoned Mine Sites

This assessment is classified as Step 2 in the guidance document *Ecological Risk Assessment Guidance for Superfund: Process for Designing and Conducting Ecological Risk Assessments* (EPA 1989). This is a preliminary, qualitative screening-level ecological risk assessment providing "exposure estimates based on conservative assumptions and maximum concentrations present; and hazard quotients indicating which (if any) contaminants and exposure pathways might pose ecological threats." Cleanup decisions should not be solely based on a screening-level ecological risk assessment, but rather in combination with conclusions from the human health risk assessment and other supporting factors.

As in the human health risk assessment, the main ecological risk assessment encompasses the combined AOCs at the BPM in exposure and risk calculations; however, risk results for each individual AOC are presented in the risk characterization section for comparison purposes.

6.1 Hazard Identification for Ecological Effects and Habitats

Analytical results from samples collected at the BPM during the summer of 2011 were used in this risk assessment. Human health COPCs presented in Section 5 were evaluated for threats to ecological receptors in this risk assessment: COPCs for soil include antimony, arsenic, cadmium, copper, iron, lead, manganese, mercury, silver, and zinc. COPCs for water include antimony, arsenic, cadmium, chromium (trivalent), copper, iron, lead, manganese, mercury, nickel, silver, and zinc.

Of these COPCs, antimony, arsenic, lead, manganese, and mercury exceeded the Circular DEQ-7 Water Quality HHS for surface water. Cadmium, copper, lead, mercury, silver, and zinc COPCs exceed the AALS from Circular DEQ-7 (DEQ 2010). AALS from DEQ are adjusted for water hardness before comparing the concentrations (this process is discussed further in Section 6.3).

6.1.1 Ecological Receptors of Concern

There are three communities classified as ecological receptors of concern in this risk assessment: aquatic life, terrestrial wildlife, and terrestrial plant communities.

The BPM covers an area approximately 1053 acres, with the approximate individual acreage for each AOC listed below:

- Combination Mill AOC: 217 acres
- Combination Mine AOC: 162 acres
- Tim Smith Mine AOC: 432 acres
- Historic Mine AOC: 242 acres

Native forestland administered by the Beaverhead-Deerlodge National Forest surrounds the disturbed mine site, which is on private property. Little to no vegetation grows on the tailings and waste rock, likely due to limits in physical and chemical soil properties. The terrestrial plant community lacking at impacted areas at BPM provides food for the local wildlife community as well as ecological health functions such as erosion control of sediments into South Fork of Lower Willow Creek. The terrestrial plant community is one of the ecological receptors of concern evaluated in this ecological risk assessment.

The mine site provides habitat for several species of terrestrial wildlife, as described in Section 1.2.5. Despite the lack of vegetation on the tailings and waste rock, wildlife are exposed to metals through consumption of soil, salt precipitates, surface water, and seep discharges. The white tail deer is a common wildlife inhabitant of Montana and represents the terrestrial wildlife community as an ecological receptor of concern evaluated in this risk assessment. The whitetail deer was chosen because of the availability of the exposure parameters and toxic thresholds in toxicology literature.

The DEQ RBCG lists the angler use of South Fork Lower Willow Creek as 3,314 total days (DEQ 1996). This creek likely provides habitat to fish and other forms of aquatic life as ecological receptors that are part of the local wildlife and human food chain. Tailings, waste rock, and soil from surrounding areas have eroded into South Fork Lower Willow Creek or have been carried downstream as sediment, potentially affecting aquatic life. The aquatic life community is also evaluated as an ecological receptor in this risk assessment.

6.2 Exposure Assessment

Exposures to COPCs present at the BPM are determined for each scenario through the processes described below. The COPC maximum arithmetic mean concentration for each set of solid matrix surface samples (soil, tailings, and waste rock) was used as the EPC for the associated solid exposure pathways. The maximum surface water and sediment concentrations for each COPC were used as the EPC for the associated water exposure pathways. Per DEQ RBCGs, seep drainage COPC concentrations were only incorporated as part of the whitetail deer exposure scenario and not part of the aquatic life exposure scenario (the potential exists for wildlife to drink from a seep, but it is less likely that aquatic life would exist in mine seeps. The EPCs for each COPC used in the exposure calculations are listed in Table 6-1.

Table 6-1. Contaminants of Potential Concern (COPCs) Exposure Point Concentrations (EPCs) for Ecological Exposure Scenarios

COPCs	Aquatic Life Surface Water Concentration [a] (µg/L)	Associated Water Hardness[b] (mg/L $CaCO_3$)	Sediment Concentration[c] (mg/kg)	Deer Ingestion Water Concentration[d] (µg/L)	Deer Ingestion/ Phytotoxicity Soil, Tailings, or Waste Rock Surface Concentration[e] (mg/kg)
Antimony	117	25	891	117	876
Arsenic	36.0	25	642	54.7	786
Cadmium	1.20	25	32.5	215	16.99
Chromium III	2.90	25	25.8	2.90	5.60
Copper	221	25	5,320	20,900	2,553
Iron	2,990	25	37,400	41,400	23,933
Lead	49.0	25	4,240	363	3,573
Manganese	52.6	25	2,780	6,640	773
Mercury	2.52	25	57.9	2.52	26.5
Nickel	4.20	25	31.2	4.20	5.08
Silver	0.64	25	213	0.64	67.8
Zinc	63.1	25	768	20,400	406

[a] Aquatic life surface water EPCs include maximum surface water concentrations for the entire BPM, excluding seep discharge
[b] Hardness results for surface water were < 25 mg/kg CaCO3 with the exception of seeps; therefore, a minimum hardness value of 25 was used
[c] Sediment EPCs include the maximum sediment concentrations for the entire BPM
[d] Deer ingestion water EPCs include maximum surface water concentrations for the entire BPM, including seep discharge
[e] Maximum concentration of the arithmetic mean concentrations from tailings concentrations associated with the most concentrated tailings area at the BPM (the Combination Mill AOC), or from waste rock concentrations from the most concentrated waste rock area (the Combination Mine AOC)
mg/kg – milligrams per kilogram
mg/L $CaCO_3$ – milligrams per liter as calcium carbonate
µg/L – micrograms per liter
COPC – contaminant of potential concern

Three ecological scenarios were used in this risk assessment, each to evaluate the three ecological receptor communities identified previously for the site. Because this is a screening-level risk assessment, and given the screening-level site investigation data that is available, these three communities and related scenarios are the most practical for this risk analysis. Calculation tables are provided in Appendix K, Tables 2 through 4.

6.2.1 Exposures for the Aquatic Life Community

This scenario evaluates the health threat to fish and other aquatic life from COPCs in South Fork Lower Willow Creek water and sediment. Tailings, waste rock, and soil from the Tim Smith Mine, Historic Mine, and Combination Mill AOCs drain into South Fork Lower Willow Creek and contaminate the creek. Seep drainage was not included as a possible exposure route for

aquatic life, as it is not considered suitable habitat. Maximum surface water and sediment concentrations for each COPC were used to evaluate the two exposure pathways.

The aquatic life scenario uses water hardness to adjust aquatic life standards for certain metals. If hardness results are below 25 mg/L then 25 mg/L is used to calculate aquatic life standards. One water sample exceeded 25 mg/L; however, the water sample was a seep sample and the aquatic life scenario calculations do not take seep/adit discharge results into consideration as feasible habitat for aquatic life. Therefore, a water hardness of 25 mg/L was used for all aquatic life standards.

6.2.2 Exposures for the Terrestrial Wildlife Community

This scenario evaluates the threat to wildlife health from COPCs for those species that use the BPM as part of their home range. The whitetail deer was chosen to represent the terrestrial wildlife community ecological receptor based on the availability of exposure parameters and toxic thresholds available in toxicology literature. It was assumed that deer using the site as part of their home range would be exposed to contaminants by ingesting surface water and soil or salt precipitates associated with tailings, waste rock, or exposed soil. Exposure through vegetation consumption was not considered based on a lack of vegetation growing on disturbed portions of the mine site. Dermal or inhalation exposures were not considered, due to lack of exposure data.

Exposure parameters for whitetail deer were taken from *Estimating Exposure of Terrestrial Wildlife to Contaminants* (Sample and Suter II 1994). Conservative estimates for body weight, soil consumption rate, water intake rate, and home range for a representative whitetail deer were used in the exposure calculations per the *Ecological Risk Assessment Guidance for Superfund: Process for Designing and Conducting Ecological Risk Assessments* (EPA 1989) for screening-level ecological risk assessments. A whitetail deer's body weight (BW) is assumed to be 56.5 kilogram (kg) (mean weight from male and female deer) (Sample and Suter II 1994). The following equation from Sample and Suter II 1994 was used to determine the water ingestion rate (WIR):

$$WIR = 0.099(BW)^{0.90}$$

The resulting WIR is 3.7 liters per day (L/d). A soil consumption rate (SCR) was assumed based on the estimated soil in the diet of whitetail deer (less than two percent) (Beyer et al. 1994), resulting in a SCR of 0.0348 kilogram soil per day (kg/day).

The maximum concentration for each COPC from surface water and seep discharge was used in the following exposure calculation for water ingestion:

$$E_{water} = (WIR * [C_{COPC}*(1/1000)]) / BW$$

Maximum COPC concentrations, based on arithmetic means in tailings at the Combination Mill AOC or waste rock at the Combination Mine AOC, were used in the following exposure calculation for soil consumption:

$$E_{soil} = (SCR * C_{COPC}) / BW$$

The 1,053 acre impacted area (A) of the entire BPM, including the four AOCs, is incorporated into the equation relative to the home range (HR) reported for a whitetail deer of 230.5 hectares (approximately 569 acres), the median of estimated home range for deer that ranges between 59 and 520 hectares (Sample and Suter II 1994). Exposure results for both pathways for each COPC were added and then multiplied by the area ratio, based on the following equation (ingestion rate (IR) implies either WIR or SCR):

$$E_{COPC} = ((A/HR) [\sum_{i=1}^{m}((IR * C) / BW)]$$

6.2.3 Exposures for Terrestrial Plant Communities

This scenario evaluates threats to the health of terrestrial plants at the BPM, as well as investigates soil chemistry related to the lack of vegetation on disturbed areas and possible phytotoxic effects to plants. The exposure pathway to terrestrial plant communities is through root-to-soil contact and the resulting uptake of COPCs. The maximum concentration based on the arithmetic mean for each COPC in tailings at the Combination Mill AOC or waste rock at the Combination Mine AOC were used as the representative concentrations a plant or seed would be exposed to at the site.

6.3 Ecological Effects Assessment

6.3.1 Toxic Thresholds for Aquatic Life Communities

DEQ's water quality AALS were used as toxic thresholds for the aquatic life community water exposure pathway scenario (DEQ 2010). The acute standards for cadmium, copper, lead, nickel, silver, and zinc did not have to be adjusted for water hardness because the hardness results for surface water samples at the BPM were less than 25 mg/L $CaCO_3$ excluding the one seep discharge sample that exceeded a hardness of 25 mg/L. This sample was not included because it was not considered feasible habitat for aquatic life. Chronic effects to aquatic life were not evaluated as consistent long-term water sampling has not occurred at the BPM. Sediment quality guidelines developed by the National Oceanographic and Atmospheric Administration (NOAA) were used for aquatic life community toxic thresholds associated with the sediment exposure pathway scenario (NOAA 1999). Toxic thresholds for both water and sediment are provided in Appendix K, Table 2 and 3.

6.3.2 Toxic Thresholds for Terrestrial Wildlife Communities

COPC NOAELs for whitetail deer provided in the *Toxicological Benchmarks for Wildlife: 1996 Revision* (Sample et al. 1996) were used as toxic thresholds for the terrestrial wildlife community scenario. These NOAELs were adjusted from toxicological studies with rats. Toxic thresholds for deer ingestion are provided in Appendix K, Table 4.

6.3.3 Toxic Thresholds for Terrestrial Plant Communities

Literature-based phytotoxic soil concentrations from several terrestrial plant toxicology studies were used as toxic thresholds for the terrestrial plant scenario. These concentrations are the most conservative estimates from a range of toxic reference values (TRVs) related to plant health acquired from these studies. The phytotoxic concentrations used in this risk assessment were summarized in the *Clark Fork River Ecological Risk Assessment* (ISSI Consulting Group 1999). The individual sources and associated phytotoxic concentrations used are provided in Appendix K, Table 5. There is some uncertainty with using a generalized phytotoxic value rather than a phytotoxic soil concentration applicable for individual plant species because different species have different levels of tolerance to toxins in soil. However, because no vegetation exists on the majority of impacted BPM land, the generalized phytotoxicity value is used.

6.4 Risk Characterization

6.4.1 Aquatic Life Community

Exposures associated with water were compared to AALS to create a ratio of exposure concentration to the aquatic life standard for each COPC. This represents the ecological impact quotient (EQ) for aquatic life to contaminants in surface water. Because long-term water quality sampling was not part of this investigation, the chronic aquatic life standard was not used and the chronic EQ was not calculated. Only the acute EQ is incorporated into the total EQ.

Sediment aquatic life exposure concentrations were compared to toxic thresholds to create a ratio of exposure to the sediment quality guidelines for each COPC. This represents the sediment EQ for aquatic life to contaminants in surface water sediment. A water or sediment EQ greater than 1.0 for a specific COPC indicates a condition that possibly threatens the health of aquatic life. Table 6-2 provides acute aquatic life and sediment EQs for each COPC (calculations are provided in Tables 2 and 3 of Appendix K).

Table 6-2. Aquatic Life Community Risk Characterization for Contaminants of Potential Concern (COPCs)

COPCs	Surface Water Concentration [a] (µg/L)	Sediment Concentration[b] (mg/kg)	AALS (µg/L)[c]	Sediment Quality Guidelines[d] (mg/kg)	Acute Aquatic Life Surface Water EQ[e]	Aquatic Life Sediment EQ[e]
Antimony	117	891	NS	NS	NA	NA
Arsenic[f]	36.0	642	340	70.0	0.11	**9.17**
Cadmium[f]	1.20	32.5	0.52	906	**2.30**	0.04
Chromium III[f]	2.90	25.8	579	370	0.01	0.07
Copper[f]	221	5,320	3.79	270	**58.3**	**19.7**
Iron	2,990	37,400	NS	NS	NA	NA
Lead[f]	49.0	4,240	13.98	218	**3.51**	**19.5**
Manganese	52.6	2,780	NS	NS	NA	NA
Mercury[f]	2.52	57.9	1.70	0.71	**1.48**	**81.6**
Nickel[f]	4.20	31.2	145	51.6	0.03	0.60
Silver[f]	0.64	213	0.374	3.70	**1.71**	**57.6**
Zinc[f]	63.1	768	37.02	410	**1.70**	**1.87**
TOTAL					**69.1**	**190**

COCs for the aquatic life community are in bold (COC is determined by an EQ>1.0)
[a] Maximum surface water concentrations for the entire BPM, excluding seep discharge
[b] Maximum sediment concentrations for the entire BPM
[c] Freshwater Acute Aquatic Life Standards (AALS), Circular DEQ-7, Montana Numeric Water Quality Standards (DEQ 2010)
[d] Sediment Quality Guidelines (NOAA 1999); medium affects range for biological effects
[e] Ratio of exposure to toxic threshold (ecological impact quotient)
[f] Priority Pollutant, Circular DEQ-7, Montana Numeric Water Quality Standards (DEQ 2010)
EQ – ecological impact quotient
mg/kg – milligrams per kilogram
µg/L – micrograms per liter
COPC – contaminant of potential concern
NA – indicates not available because no toxic threshold available
NS – a standard has not been developed

COCs for the aquatic life community at the BPM include arsenic, cadmium, copper, lead, mercury, silver, and zinc. Each of these COCs originate through exposure to contaminated sediments or surface water present in South Fork Lower Willow Creek within or downstream of the Combination Mill AOC. Contaminants in these sediments and surface water originate primarily from erosion of mine tailings.

6.4.2 Terrestrial Wildlife Communities

The exposure values for whitetail deer from soil and water ingestion were summed for each COPC and then compared to toxic threshold values to create a ratio of COPC exposure to the NOAEL. This ratio compares the deer ingestion EQ to contaminants in surface water, soil, tailings, and waste rock at the BPM. An EQ greater than 1.0 for a specific COPC indicates an environmental concentration that possibly threatens the health of terrestrial wildlife. Table 6-3 provides the resulting deer ingestion EQs for each COPC.

Table 6-3. Terrestrial Wildlife Community Risk Characterization for Contaminants of Potential Concern (COPCs)

COPCs	Surface Water Concentration[a] (µg/L)	Solid Concentration[b] (mg/kg)	Total Deer Exposure[c] (mg/kg-day)	NOAELs/ Toxic Thresholds[d] (mg/kg-day)	Deer Ingestion Soil and Water EQ[e]	Toxic Endpoint Source
Antimony	117	876	1.01	0.02	**53.0**	Sample et. al, 1996
Arsenic	54.7	786	0.90	0.02	**47.3**	Sample et. al, 1996
Cadmium	215	16.99	0.03	0.27	0.12	Sample et. al, 1996
Chromium III	2.90	5.60	0.01	768.00	0.00	Sample et. al, 1996
Copper	20,900	2,553	4.28	4.30	0.995	Sample et. al, 1996
Iron	41,400	23,933	NS	NS	NA	NA
Lead	363	3,573	4.10	0.01	**819**	ATSDR, 1993
Manganese	6,640	773	1.32	25.00	0.05	Sample et. al, 1996
Mercury	2.52	26.5	0.03	0.36	0.08	Sample et. al, 1996
Nickel	4.20	5.08	0.01	11.22	0.00	Sample et. al, 1996
Silver	0.64	67.8	NS	NS	NA	NA
Zinc	20,400	406	1.80	44.90	0.04	Sample et. al, 1996
TOTAL					**921**	

COCs for the terrestrial wildlife community are in bold (COC is determined by an EQ>1.0)
[a] Maximum surface water concentrations for the entire BPM, including seep discharge
[b] Maximum concentration of the arithmetic mean concentrations from tailings concentrations associated with the most concentrated tailings area at the BPM (the Combination Mill AOC), or from waste rock concentrations from the most concentrated waste rock area (the Combination Mine AOC)
[c] Combined soil and water exposures (Sample and Suter II 1994)
[d] The most recent and most conservative estimated NOAELs (Sample et al. 1996) used for toxic threshold values
[e] Ratio of exposure to toxic threshold (ecological impact quotient)
EQ – ecological impact quotient
mg/kg – milligrams per kilogram
µg/L – micrograms per liter
COPC – contaminant of potential concern
NA – indicates not available because no toxic threshold available

NS – a standard has not been developed

Antimony, arsenic, and lead are the COCs for the terrestrial wildlife community at the BPM, with EQs of 52.96, 47.34, and 819.27, respectively. Each of these COCs originate through exposure to contaminated surface water from South Fork Lower Willow Creek at the Combination Mill AOC or seeps at the Combination Mine AOC, and from tailings or waste rock from the Combination Mill AOC or Combination Mine AOC.

6.4.3 Terrestrial Plant Communities

Terrestrial plant exposures were compared to TRVs to obtain a ratio of the exposure value to phytotoxic threshold value for each COPC. The resulting ratio represents the phytotoxic EQ. An EQ greater than 1.0 for a specific COPC indicates an environmental concentration that potentially inhibits growth and/or is phytotoxic to the terrestrial plant community. Table 6-4 provides the phytotoxic EQs for each COPC.

Table 6-4. Terrestrial Plant Community Risk Characterization for Contaminants of Potential Concern (COPCs)

COPCs	Solid Concentration (mg/kg)[a]	Phytotoxic Soil Concentration (mg/kg)[b]	Terrestrial Plant Phytotoxicity EQ[c]	Toxic Threshold Source
Arsenic	786.02	10.00	**78.6**	Efroymson et al. 1997
Cadmium	16.99	3.00	**5.66**	Kabata-Pendias and Pendias 1992
Copper	2553.30	60.00	**42.6**	Kabata-Pendias and Pendias 1992
Lead	3572.93	50.00	**71.5**	Efroymson et al. 1997
Mercury	26.45	5.00	**5.29**	CH2M Hill 1987
Zinc	405.66	50.00	**8.11**	Efroymson et al. 1997
TOTAL			**212**	

COCs for the terrestrial plant community are in bold (COC is determined by an EQ>1.0)
[a] Maximum concentration of the arithmetic mean concentrations from tailings concentrations associated with the most concentrated tailings area at the BPM (the Combination Mill AOC)
[b] Most conservative estimated toxic reference value for phytotoxicity from several toxicology studies
[c] Ratio of exposure to toxic threshold (ecological impact quotient)
EQ – ecological impact quotient
mg/kg – milligrams per kilogram
COPC – contaminant of potential concern

COCs for terrestrial plant communities at the BPM include arsenic, cadmium, copper, lead, mercury, and zinc, each resulting from contaminants in tailings at the Combination Mill AOC. These COCs are inhibiting vegetation growth on the impacted areas at BPM.

6.4.4 Individual AOC Risk Characterization

For comparison purposes, ecological risk calculations were completed for each AOC using the maximum concentrations for each COPC in each media, solids (tailings, waste rock and soil) or

surface water from each site. Individual AOC results were incorporated into the whitetail deer exposure calculations.

Because there were no solid media surface samples collected at the Tim Smith Mine AOC, soil ingestion was not included in the terrestrial wildlife exposure calculations for this AOC; in addition, no terrestrial plant exposures were evaluated. The only surface water present for the Combination Mine AOC are seeps, so the associated EQ results for aquatic life and terrestrial wildlife water ingestion reflect COPC concentrations in the seeps. The comparison ecological risk results are shown for each of the three ecological receptor communities in Tables 6-5 to 6-7.

Table 6-5. Comparison of Aquatic Life Ecological Impact Quotients (EQs) at each AOC

	Combination Mill AOC		Combination Mine AOC		Historic Mine AOC		Tim Smith Mine AOC	
COPCs	Surface Water EQ[a]	Sediment EQ[a]	Surface Water EQ[a, b]	Sediment EQ[b]	Surface Water EQ[a]	Sediment EQ[a]	Surface Water EQ[a]	Sediment EQ[a]
Antimony	NA	NA	NA	NA	NA	NA	NA	NA
Arsenic	0.11	**9.17**	0.16	NA	0.01	0.35	0.01	0.44
Cadmium	**2.30**	0.04	**413**	NA	0.50	0.01	0.54	0.01
Chromium III	ND	0.07	ND	NA	ND	0.06	0.01	0.06
Copper	**58.3**	**19.7**	**5,512**	NA	**28.2**	**10.3**	**8.04**	**2.37**
Iron	NA	NA	NA	NA	NA	NA	NA	NA
Lead	**3.51**	**19.5**	**26.0**	NA	0.21	**1.40**	0.38	0.50
Manganese	NA	NA	NA	NA	NA	NA	NA	NA
Mercury	**1.48**	**81.6**	ND	NA	0.07	**38.6**	0.02	**34.4**
Nickel	0.02	0.49	ND	NA	0.02	0.52	0.03	0.60
Silver	**1.71**	**57.6**	ND	NA	0.00	0.92	ND	**1.65**
Zinc	**1.70**	**1.87**	**551**	NA	0.85	0.66	0.60	0.58
TOTAL	**69.1**	**189.9**	**6,502**	NA	**29.9**	**52.8**	**9.63**	**40.6**

EQs>1.0 are highlighted in bold.
EQs reflect the aquatic life exposures to COPCs present in surface water (excluding seep discharge) and sediments
[a] The maximum COPC concentration per media was used as the exposure point concentration in exposure calculations
[b] The only surface water present at the Combination Mine AOC is seep discharge; no sediment samples were collected at the Combination Mine AOC
EQ – ecological impact quotient
COPC – contaminant of potential concern
NA – indicates no aquatic threshold available for this COPC or no sample was taken
ND – indicates no COPC was detected in sample analysis

Table 6-6. Comparison of Terrestrial Wildlife Ecological Impact Quotients (EQs) at each AOC

COPCs	Combination Mill AOC Deer Ingestion- Soil and Water EQ[a]	Combination Mine AOC Deer Ingestion- Soil and Water EQ[a]	Historic Mine AOC Deer Ingestion- Soil and Water EQ[a]	Tim Smith Mine AOC Deer Ingestion-Water EQ[a,b]
Antimony	**40.1**	**9.32**	**16.0**	0.004
Arsenic	**30.3**	**5.14**	**15.7**	0.011
Cadmium	0.04	0.10	0.01	ND
Chromium III	0.00	0.00	0.00	ND
Copper	0.37	0.54	0.13	NA
Iron	NA	NA	NA	NA
Lead	**448**	**70.0**	**257**	0.069
Manganese	0.01	0.02	0.01	NA
Mercury	0.14	NA	0.01	NA
Nickel	0.00	0.00	0.00	ND
Silver	NA	NA	NA	NA
Zinc	0.01	0.05	0.002	0.00
TOTAL	**519**	**85.2**	**289**	0.089

EQs>1.0 are highlighted in bold.
EQs reflect the terrestrial wildlife (whitetail deer) exposures to COPCs present in surface water (including seep discharge) and tailings, waste rock, or soil present at each AOC.
[a] The maximum COPC concentration per media was used as the exposure point concentration in exposure calculations
[b] No solid media surface samples were collected from the Tim Smith AOC; this EQ does not reflect soil ingestion.
EQ – ecological impact quotient
COPC – contaminant of potential concern
NA – indicates no available deer NOAEL or toxic threshold available for this COPC or no sample was taken
ND – indicates no COPC was detected in sample analysis

Table 6-7. Comparison of Terrestrial Plant Ecological Impact Quotients (EQs) at each AOC

COPCs	Combination Mill AOC Plant Phytotoxicity EQ	Combination Mine AOC Plant Phytotoxicity EQ	Historic Mine AOC Plant Phytotoxicity EQ	Tim Smith Mine AOC Plant Phytotoxicity EQ
Antimony	NA	NA	NA	NA
Arsenic	**244.00**	**53.70**	**114.00**	NA
Cadmium	**16.40**	**22.33**	**3.80**	NA
Copper	**110.50**	**946.67**	**34.67**	NA
Iron	NA	NA	NA	NA
Lead	**190.40**	**37.20**	**98.00**	NA
Manganese	NA	NA	NA	NA
Mercury	**43.00**	0.22	**2.60**	NA
Silver	NA	NA	NA	NA
Zinc	**22.20**	**87.60**	**6.52**	NA
TOTAL	**626.50**	**1147.72**	**259.59**	NA

EQs>1.0 are highlighted in bold
EQs reflect terrestrial plant exposures to COPCs present in tailings, waste rock, or soil
No solid media surface samples were collected from the Tim Smith AOC; no terrestrial plant EQ was completed
The maximum COPC concentration for tailings, waste rock, or soil was used as the exposure point concentration in exposure calculations
EQ – ecological impact quotient
COPC – contaminant of potential concern
NA – indicates no phytotoxic threshold available for this COPC or no sample was taken

6.4.5 Risk Characterization Summary

EQs from the evaluated scenarios in this ecological risk assessment are summarized in Table 6-8. The COPC total EQ is the sum of ecological impact quotients across ecological receptors and exposure pathways for that contaminant. The total EQ represents the total ecological impact quotient across contaminants present at the BPM.

Table 6-8. Summary of Ecological Impact Quotients (EQs) for Ecological Receptors, Exposure Pathways, and Contaminants of Potential Concern (COPCs)

COPCs	Acute Aquatic Life Surface Water EQ	Aquatic Life Sediment EQ	Deer Ingestion-Soil and Water EQ	Terrestrial Plant Phytotoxicity EQ	Total EQ by COPC
Antimony	NA	NA	**53.0**	NA	**53.0**
Arsenic	0.11	**9.17**	**47.3**	**78.6**	**135**
Cadmium	**2.30**	0.04	0.12	**5.66**	**8.13**
Chromium III	0.01	0.07	0.00	NA	0.08
Copper	**58.3**	**19.7**	0.995	**42.6**	**122**
Iron	NA	NA	NA	NA	NA
Lead	**3.51**	**19.5**	**819**	**71.5**	**914**
Manganese	NA	NA	0.05	NA	0.05
Mercury	**1.48**	**81.6**	0.08	**5.29**	**88.4**
Nickel	0.03	0.60	0.00	NA	0.63
Silver	**1.71**	**57.6**	NA	NA	**59.3**
Zinc	**1.70**	**1.87**	0.04	**8.11**	**11.7**
TOTAL	**69.1**	**190**	**921**	**212**	**1,392**

COCs for ecological receptors are in bold (COCs determined by an EQ> 1.0)
EQ – ecological impact quotient
COPC – contaminant of potential concern
NA – indicates no EQ could be calculated for the COPC as a toxic threshold was not available

This risk assessment qualitatively presents potential threats to the health of terrestrial plants, wildlife, and aquatic life communities that may use the BPM for habitat. This ecological risk assessment is a conservative screening-level assessment and provides conservative EQs. Results indicate that several contaminants present at the site threaten the health of the BPM ecosystem. Contaminants present in the surface water and sediments in South Fork Lower Willow Creek pose a significant risk to the health of aquatic life (COCs include arsenic, cadmium, copper, lead, mercury, silver, and zinc, with surface water EQs above 1.0 ranging between 1.48 and 58.3 and sediment EQs above 1.0 ranging between 1.87 and 81.6).

Similar to the results found in the human health risk assessment, the COCs for terrestrial wildlife present at the BPM include antimony, arsenic, and lead. The soil and water ingestion EQs above 1.0 for these COCs range between 47.3 and 819, indicating potential health threats of 47 to 819 times the given toxic threshold for specific COCs to the terrestrial wildlife community at the BPM.

Each of the COPCs evaluated in the terrestrial plant scenario for phytotoxicity resulted in EQs greater than 1.0. COCs for terrestrial plant communities include arsenic, cadmium, copper, lead, mercury, and zinc, with EQs above 1.0 ranging between 5.29 and 78.6. Concentrations of these contaminants are likely a contributing factor to the lack of vegetation on impacted areas at the site.

7.0 Repository Site Investigation

As much as 400,000 cubic yards (cy) of metals-impacted materials are estimated to be present at the BPM (Table 7-1) based on historical investigations and the RI investigation. A large portion of the estimated waste volume is associated with the Combination Mine waste rock pile. An interpreted cross section of the waste rock pile, which was used to estimate the volumes, is illustrated on Figure 7-1. Other waste materials include impacted soils from the Combination Mine Soils Removal Areas; waste rock from the Tim Smith and Historic Mine AOCs; and tailings, impacted soils, and sediments from the Combination Mill AOC. These impacted materials are a source for surface water and shallow groundwater contamination at the site. Some, or all of these materials may be placed in an onsite, engineered, mine waste repository. A preliminary geotechnical site investigation was performed as part of the RI to support siting this mine waste repository at the BPM.

Table 7-1. Estimated Impacted Waste Volumes at Black Pine Mine

Impacted Waste Location	Estimated Volume (cy)[1]
Combination Mine Waste Rock Pile	230,000
Combination Mine Soils Removal Areas	5,000
Tim Smith Waste Rock Dumps at Tim Smith No. 1 and No. 2 Adits	22,650
Combination Mill Sediments, Soils, and Tailings Impoundments	107,900
South Fork Lower Willow Creek Stream Sediments	18,000
Historic Mine Area Waste Rock Areas	13,350
Total	**396,900**

[1]Quantities are preliminary; estimates and will be refined based on further evaluation and design.

7.1 Potential Repository Locations

Four potential repository areas were investigated during the RI. Two of the areas, Repository 1 and Repository 2, were identified for investigation during development of the RWP. A third location, Repository 3, was identified in the field during the repository investigation. A fourth repository, the Combination Mill Repository, was identified by the USFS. Potential repository sites were limited to areas within the Trust property boundary to avoid constructing a repository on USFS administered lands and to reduce material haul distances. Repositories 1, 2, and 3 are shown on Figure 2-12. The USFS-proposed Combination Mill Repository area is shown on Figure 2-7. Test pit logs and soil boring/monitoring well logs for these locations are included as Appendix L. The geotechnical laboratory reports are provided in Appendix H.

Based on results from preliminary investigations during the RI, the proposed Repository 2 area appears to be a better alternative as compared with the other proposed repository areas for long-term waste storage. While weathered bedrock is shallow in this area, a portion of the repository area could be over-excavated. Based on fluid level monitoring to date, there appears to be separation from groundwater, although the separation will need to be confirmed during seasonal high groundwater levels during the spring snowmelt. The proposed Repository 1 site encountered bedrock near the surface and would provide a limited source of borrow material. Bedrock is also shallow in the Repository 3 area, limiting the ability to excavate a repository, and would greatly increase construction costs if blasting would be required. Repository 3 would also have the most difficult haul of the four repository areas. Shallow groundwater, limited storage, and distance from the Combination Mill waste rock pile are the primary concerns for Combination Mill Repository. Due to the concerns with the Repository 1, Repository 3, and Combination Mill Repository areas, these three repositories areas were not investigated to the same level as the Repository 2 area. Each repository location is discussed in more detail in the following sections.

7.1.1 Potential Repository 1

The Repository 1 area is located along the west side of the ridge above the Combination Mine waste rock pile and west of Black Pine Road. The area encompasses approximately 12 acres. The Repository 1 location was originally proposed by the DEQ based on its proximity to the Combination Mine waste rock pile, which comprises more than half of the estimate waste volume. Additionally, this location likely avoids conflicts with underground mine workings, is readily accessible, has a southern exposure to limit snow accumulation, is sparsely treed, and likely would reduce the potential for groundwater interactions.

Concerns with this location include the shallow bedrock (confirmed through excavation of test pits RY-SS-01 and RY-SS-02), and the high-visibility of the location. Due to the shallow bedrock, the repository would need to be constructed above grade in an effort to control site development costs. The ridge top location of this site, coupled with the need to construct an above-grade repository, would limit the ability to blend the repository with the native terrain and would result in an obvious waste repository. The location would also require loaded trucks to travel upgrade to haul wastes to the repository.

Two test pits, RY-SS-01 (total depth 52 inches bgs) and RY-SS-02 (total depth of 32 inches bgs) were excavated within the Repository 1 area. The test pit depths were limited based on refusal of the excavator in bedrock. Highly weathered bedrock was encountered at the surface of both test pits and extended to 0.5 feet bgs. Weathered bedrock was encountered at 0.5 feet bgs and competent bedrock was encountered as shallow as 32 inches (RY-SS-02). Shallow groundwater was not observed in either test pit. A monitoring well was not installed in this repository area based on the shallow depth of bedrock observed in the test pits.

A surface sample and a subsurface sample were submitted from each test pit for geotechnical testing (Tables H-1 and H-2 in Appendix H). A surface sample from RY-SS-01, and a surface and subsurface sample from RY-SS-02 were submitted for analytical testing (Table 7-2). A

subsurface sample was not collected for analytical analysis in test pit RY-SS-01 as the material was observed to be homogeneous throughout the test pit depth.

7.1.2 Potential Repository 2

The Repository 2 area is located in a topographic bowl north of the access road to the Lewis Shaft and includes the Harrison and Harper shaft areas. The repository area, as shown on Figure 2-12, is located between the overhead power line that runs to the Lewis Shaft and Tim Smith Mine, the overhead power line that runs to the Combination Mine, County Road 678 and County Road 448. This area encompasses approximately 15 acres. The Repository 2 location was identified based on the relatively shallow slope and because a portion of the area (Harper Shaft waste rock area and Harrison Shaft waste rock area) will be impacted by waste removal operations, reducing the net impact of constructing a repository. The area is also located high in the drainage, reducing the likelihood of groundwater influx into the bottom of a repository. The area is accessible by existing site roads and is located roughly equidistant to each of the primary waste areas. The shape of the existing topography should allow repository grading to blend with the surrounding terrain.

Concerns with this location include potential groundwater interactions due to its location at the head of Mill Creek and the presence of the two power lines. One or both of these power lines may need to be relocated depending on the final configuration and grading of a repository in this area. A portion of the proposed Repository 2 area also overlies underground mine workings. Further review of mine maps should be completed to delineate areal coverage of mine workings, as well as the depth to the workings prior to additional repository investigations. Similar to Repository 1, waste materials would need to be hauled upgrade and weathered bedrock is relatively shallow. While a portion of the repository could be constructed below grade (estimated at five feet for most of the potential footprint, and up to 10 feet in portions of the footprint) by conventional excavation equipment, a large portion of the waste material would need to be placed above grade, depending on the design and stability of the repository. The excavated material would then need to be disposed or used for other purposes on site. Due to the high cobble and gravel content, the material is not suitable for use as a liner or for a cover.

Two test pits, RY-SS-03 (total depth 14 feet bgs) and RY-SS-04 (total depth of 10.5 feet bgs) were excavated within the Repository 2 area. The test pit depths were limited due to a combination of nearing the reach of the excavator and excavation in weathered bedrock. Weathered bedrock was encountered at depths ranging from approximately 0.8 feet to three feet bgs and competent bedrock was encountered as shallow as 8 feet bgs in RY-SS-04. A wet soil zone was observed at 33 inches bgs in test pit RY-SS-04. A surface sample and a subsurface sample were submitted from each test pit for geotechnical testing (Tables H-1 and H-2 in Appendix H). A surface sample and a subsurface sample from RY-SS-03, and a surface and two subsurface samples from RY-SS-04 were submitted for analytical testing (Table 7-2).

Three borings were installed along the periphery of the Repository 2 area using a hollow stem auger drill rig in August 2011. Each of these borings were completed as shallow monitoring wells based on the wet zone observed in test pit RY-SS-04 and observed moist zones in the

borings. These moist zones were estimated to be the zones most likely to generate groundwater and provide groundwater depth information at the proposed repository site. These monitoring wells did not allow documentation of adequate separation between the base of the repository and groundwater to meet ARAR guidelines (Section 9); therefore, a fourth boring was installed downslope of the proposed repository in January 2012 using an air rotary drill rig. This boring was completed as a deep monitoring well. Depth information for the borings/monitoring wells follows:

- Boring MW-RY-06, located near the center of the potential repository area, was drilled to a total depth of 28 feet bgs. The monitoring well was completed to a depth of 13 feet bgs and screened from three feet to 13 feet bgs.

- Boring MW-RY-07, located along the power line road downslope of the potential repository area, was drilled to a total depth of 26 feet bgs. The monitoring well was completed to a depth of 13 feet bgs and screened from three feet to 13 feet bgs.

- Boring MW-RY-08, located north of the repository area, was drilled to a total depth of nine feet bgs. The monitoring well was completed to a depth of eight feet bgs and screened from three feet to eight feet bgs.

- Boring MW-RY-09, located approximately 39 feet southwest of MW-RY-07 along the power line road, was drilled to a total depth of 32 feet bgs. The monitoring well was completed to a depth of 30 feet bgs and screened from 10 feet to 30 feet bgs.

Highly weathered bedrock was encountered at approximately 4.5 feet bgs and weathered bedrock at approximately 19.5 feet. The competency (hardness) of the weathered bedrock appeared to increase at approximately 24 feet bgs.

No groundwater was detected in the monitoring wells. A subsurface sample was submitted from each boring for geotechnical testing (Tables H-1 and H-2 in Appendix H). A surface sample and a subsurface sample from MW-RY-06 and MW-RY-07, and a surface sample from MW-RY-08 were submitted for analytical testing (Table 7-2). No samples were obtained for analytical or geotechnical testing from MW-RY-09. The purpose of this well was to determine the depth to groundwater during the spring 2012 runoff season and to allow for ongoing monitoring of groundwater elevations.

7.1.3 Potential Repository 3

Repository 3 is located along the south face of the ridge separating the Lewis Shaft from the Tim Smith No. 1 Adit, and west of the road from the Lewis Shaft to the Tim Smith No. 1 Adit. The repository area, as shown on Figure 2-12, is approximately nine acres. This repository site was identified and investigated in the field based on sparse tree coverage, anticipated deep depths to underground mine workings, anticipated separation from groundwater, its location away from main traffic areas, and its southern exposure. This area was also investigated as a possible borrow source for repository construction in other areas.

Concerns with this location include the presence of the power line running to the Tim Smith No. 1 Adit and shallow bedrock depth. The power line may need to be relocated depending on the final footprint and grading of a repository to blend into the surroundings in this area. Similar to Repository 2, a portion of the proposed Repository 3 area also overlies underground mine workings. However, based on the location of this potential repository near the top of the ridge, the depth to workings is anticipated to be greater than in the Repository 2 area. Further review of mine maps should be completed to delineate areal coverage of mine workings, as well as the depth to the workings prior to additional repository investigations. Similar to Repository 1 and Repository 2, waste materials would need to be hauled upgrade. Surface soils could be removed but based on the shallow depth to bedrock the majority of the waste material would need to be placed above grade.

One test pit, RY-SS-05 (total depth five feet bgs) was excavated within the Repository 3 area. The test pit depth was limited based on refusal of the excavator in bedrock. Weathered bedrock was encountered at 0.5 feet bgs and competent bedrock was encountered at five feet bgs. Shallow groundwater was not observed in the test pit. A monitoring well was not installed in this repository area based on the shallow depth of bedrock observed in the test pit. A surface sample and a subsurface sample were submitted from the test pit for geotechnical testing (Tables H-1 and H-2 in Appendix H). A surface and subsurface sample were submitted for analytical testing (Table 7-2).

7.1.4 Combination Mill Repository

The Combination Mill Repository is located west of South Fork Lower Willow Creek in the area of the Combination Mill. This repository location was investigated at the request of the USFS. The approximate extent of this area (8 acres) is shown on Figure 2-7. The USFS proposed this location based on its proximity to the Combination Mill tailings impoundment and associated downstream impacted materials. Material haul distances for these impacted materials would be less than for other areas. A repository in this area also would not require the steeper upgrade hauls associated with the other sites. This area was also previously used as a soil borrow area and as a result, a repository in this area could be sited within the previous disturbance.

Concerns with this location include shallow groundwater, limited capacity, and the distance to other source materials. The site is located above, but adjacent to South Fork Lower Willow Creek. Groundwater was expected to be shallow and was observed at a depth of five feet in the test pit CML-SS-11. A repository in this location would require a bottom liner and drain system to provide a separation from groundwater and maintain slope stability. The repository would also need to be built above grade. While this repository area would provide an ideal location in terms of its location relative to impacted materials associated with the Combination Mill and tailings impoundment, the haul would be further from other source areas. Waste from other areas would need to be hauled past other repository options to reach the Combination Mill Repository area.

One test pit, CML-SS-11 (total depth 14.5 feet bgs), was excavated within the Combination Mill Repository area. Bedrock was not encountered in the test pit. Shallow groundwater was encountered at a depth of five feet bgs. A monitoring well was not installed in this repository

area based on the shallow depth of groundwater encountered in the test pit. A subsurface sample was submitted from the test pit for geotechnical testing (Tables H-1 and H-2 in Appendix H). A surface and subsurface sample were submitted for analytical testing (Table 7-2).

7.2 Field Methods, Procedures, and Observations

Field investigations were conducted at the proposed repository locations during July (test pitting) and August (borings) 2011. The field investigations included a site reconnaissance, excavating six exploratory test pits, and drilling three borings that were completed as monitoring wells. A fourth boring was drilled and completed as a monitoring well during January 2012. During the field investigation 17 representative soil samples for analytical analysis (Table 7-2), 13 representative soil samples for ABA (Table 7-3), and 14 representative soil samples for geotechnical testing (Tables H-1 and H-2 in Appendix H) were collected from the repository test pits and borings. Cross references between location IDs, field IDs, and laboratory IDs are provided in Appendix B-12 for samples submitted for analytical analyses and in Tables H-1 and H-2 in Appendix H for samples submitted for geotechnical testing. Samples were not collected for analytical or geotechnical testing from boring MW-RY-09 installed during January 2012 as this boring was installed with an air rotary rig and targeted at confirming separation from groundwater. Chip samples ejected from the borehole while advancing the air hammer drill bit were obtained at five-foot intervals for logging purposes.

In addition to soils from the repository areas, one sample from the Harper Shaft waste rock area, one sample from the Harrison Shaft waste rock area, one sample from the Tim Smith No. 1 Adit waste rock dump, and two soils samples from the Combination Mine Soils Removal Areas were also submitted for geotechnical testing. Field crews documented repository investigations with field notes, photographs, and test pit/borehole logs. Field notes and repository test pit/borehole logs are provided in Appendix L. A photo log is provided in Appendix M.

In general, the sampling methodology included in the RWP was followed during repository test pitting and boring investigations. Deviations from the RWP are outlined in Section 2.3, Deviations from the Work Plan.

7.2.1 Site Reconnaissance

A visual site reconnaissance was performed concurrent with field sampling events. The field team reviewed the areas for occurrences of groundwater seeps, wet or boggy areas, surficial erosion features, and slope instability. Test pits, borings, and surficial soil sampling locations were selected to assess conditions across the potential repository areas. Repository 1, Repository 2, and Repository 3 areas shown on Figure 2-12 total approximately 12 acres, 15 acres, and nine acres, respectively. There appears to be room to expand these areas, if appropriate. The approximate proposed Combination Mill Repository footprint, shown on Figure 2-7, is approximately eight acres.

7.2.2 Test Pit Sampling

Six test pits were excavated in July 2011 using a Caterpillar 322B excavator. The test pits were excavated to the maximum reach of the excavator or until refusal in bedrock, which varied in depth from approximately 2.7 to 14.5 feet bgs. Soil samples for geotechnical testing were obtained and placed in sealable plastic bags and in five-gallon lidded plastic buckets. Soils samples for analytical analyses were obtained as described in Section 2.1.1, Field Sampling Methods. Soil samples were collected and analyzed in general accordance with the RWP, except as outlined in Section 2.3, Deviations from the RWP.

Surficial soil layer samples were obtained at five test pit locations (RY-SS-01 through RY-SS-05) for geotechnical testing. Depths of the surface soil samples collected for geotechnical testing ranged from 0 to 2.7 feet bgs. Surficial soil samples were obtained from six test pit locations for analytical analyses. These surface samples were collected from 0 to 0.5 feet bgs, with the exception of the surface sample from CML-SS-11 that was collected from one to three feet bgs. Duff and organic materials were scraped to expose the underlying soil prior to sampling.

Subsurface soil samples were collected from each of the six repository test pits for geotechnical testing. Depths of the subsurface soil samples collected for geotechnical testing ranged from 0.5 to 13 feet bgs. Depths of subsurface soil samples were dependent on the actual depth of the test pits. Subsurface samples were obtained from five of the six test pits (no subsurface sample was collected from RY-SS-01) for analytical analyses. Two subsurface samples were collected from RY-SS-04 for analytical analyses. Depths of the subsurface soil samples collected for analytical analyses ranged from two to 13 feet bgs.

A seventh test pit was excavated between RY-SS-04 and MW-RY-07 to confirm that the wet seam observed in test pit RY-SS-04 extended beyond the immediate area. This test pit was used for visual confirmation of the subsurface conditions observed in test pit RY-SS-04 and was not logged. Samples also were not collected from this un-named test pit.

7.2.3 Boreholes and Monitoring Wells Sampling

Four borings, completed as monitoring wells, were installed within and along the perimeter of the proposed Repository 2 area. Borings/monitoring wells were not installed in the other repository areas as they were determined not to be viable options based on observations during test pitting:

- A boring/monitoring well was originally slated for installation in the Repository 1 location; however, this boring was not installed due to the shallow bedrock encountered during test pitting.

- A boring/monitoring well was not installed in the Repository 3 location due to shallow bedrock encountered during test pitting.

- No boring/monitoring well was installed at the proposed Combination Mill Repository site due to the shallow groundwater (five feet bgs) observed in test pit CML-SS-11.

Boland Drilling advanced the three soil borings (MW-RY-06, MW-RY-07, and MW-RY-08) in the proposed Repository 2 area with a hollow stem auger drill rig from August 16 - 17, 2011. Alternating 3-inch diameter and 2-inch diameter split spoon samplers were used to obtain samples continuously over the depth of the borings as described in Section 2.1.1, Field Sampling Methods.

Surficial soil samples were obtained from each of the three borings for analytical analyses. These surface samples were collected from zero to 0.5 feet bgs. Subsurface samples were obtained from two of the three borings (no subsurface sample was collected from MW-RY-08) for analytical analyses. The subsurface sample from MW-RY-06 was collected from four to five feet bgs, while the subsurface sample from MW-RY-07 was collected from 10 to 11 feet bgs. Composite samples were collected from the drill cuttings from the three borings for geotechnical testing. The composite sample from MW-RY-06 was from auger drill cuttings brought to the surface collected between three and 12 feet bgs, the composite sample from MW-RY-07 was from auger drill cuttings between 0.5 and three feet bgs. The sample from MW-RY-08 was collected at a depth of eight to 10 feet bgs.

O'Keefe Drilling advanced a fourth soil boring along the downgradient edge of the proposed Repository 2 area, approximately 39 feet southwest of MW-RY-07, with an air rotary drill rig on January 27, 2012. Rock chips samples were collected for preparing the boring log, but no samples were collected for geotechnical or analytical testing due to the drilling method. The air rotary drilling method uses an air hammer drill bit to impact and break up the material and uses air pressure to eject the cuttings from the borehole. The air pressure can also loosen material from the borehole wall and eject it from the borehole. The main purpose for this borehole/monitoring well was to observe the depth to groundwater and determine if there will be an adequate separation between the base of the proposed repository and groundwater.

Groundwater monitoring wells were completed in the borings advanced at the proposed Repository 2 site. Each monitoring well was constructed of 2-inch diameter, blank PVC casing and slotted PVC (10-slot) surrounded by a sand filter pack. Monitoring well construction details are provided on the soil boring and monitoring well logs included in Appendix L. Monitoring wells MW-RY-06 and MW-RY-07 were screened from approximately three to 13 feet bgs, while monitoring well MW-RY-08 was screened from approximately three to nine feet bgs. These three wells were screened shallow based on the observed shallow (33 inches bgs) wet seam in test pit RY-SS-04, as well as observed moist soils during completion of the borings. No groundwater was observed in the monitoring wells at the time of construction, or during subsequent fluid level monitoring in November 2011.

The shallow screened intervals for MW-RY-06 through MW-RY-08 did not allow for confirmation of adequate separation from groundwater (minimum of 10 feet below the bottom of the proposed repository). Therefore, the fourth monitoring well, MW-RY-09 was installed. This

monitoring well was screened from 10 to 30 feet bgs. No groundwater was observed in this monitoring well at the time of construction.

No groundwater samples were collected from the monitoring wells during the RI as the monitoring wells were dry.

7.3 Subsurface Conditions

7.3.1 Soils and Bedrock

The observed site soils are composed of residual soils. Residual soil is the result of in-situ physical (heat, water, ice, and pressure acting on the rock) and chemical (leaching, dissolving, and oxidizing of the rock) weathering of bedrock. Residual soils ranged from silty sand with cobbles and gravel to cobbles with gravel and sand and trace amounts of silt. At depth, residual soil is less weathered, resembling the parent bedrock. The transition from soil to weathered bedrock to bedrock is gradual and may be difficult to distinguish. Overall, the observed soils were generally coarse-grained.

Highly weathered and weathered bedrock were encountered in each of the test pits and borings at each of the repository locations, except for the Combination Mill Repository. Highly weathered bedrock was encountered at the ground surface at the Repository 1 location and at depths ranging from the surface down to approximately three feet bgs at the Repository 2 location. At the Repository 3 location, weathered bedrock was encountered at approximately 0.5 feet bgs. Beneath the highly weathered bedrock, the degree of weathering was observed to decrease in each of the test pits excavated in the Repository 1, Repository 2, and Repository 3 areas. The bedrock was generally observed to be reddish brown to purple shale. Where fractured weathered bedrock was encountered in test pits at Repository 1 and Repository 3, silt lined the fractures. The excavator bucket hit refusal in the bedrock at depths ranging from approximately 2.6 feet bgs (Repository 1, RY-SS-02) to five feet bgs (Repository 3, RY-SS-05) to 14 feet bgs (Repository 2, RY-SS-03). Hollow stem auger refusal was encountered at depths ranging from approximately 9 to 28 feet bgs in the borings installed at the proposed Repository 2 location.

A summary of subsurface conditions encountered in each test pit is presented in Table 7-4. The descriptions in Table 7-4 represent interpretation of the combination of field test pit logs/notes and geotechnical laboratory testing results. Test pit logs and field notes are included in Appendix L.

Table 7-4. Repository Test Pit Lithology Summary

Test Pit	Location	Total Depth (feet)	Depth Interval (feet) / Material Description	
RY-SS-01	Repository 1	4.3	0 – 0.5	Highly Weathered Bedrock – Silty Gravels with Sand
			0.5 – 4.2	Weathered Bedrock – Well graded Gravel, with Silt, Sand & Cobbles
			4.2 – 4.3	Shale Bedrock
			Shale Bedrock at 4.2 feet	
RY-SS-02	Repository 1	2.7	0 – 0.5	Highly Fractured Shale Bedrock with Topsoil – Silt filled fractures (well graded Gravel, with Silt)
			0.5 – 2.7	Fractured Weathered Shale Bedrock – with Silt filled fractures (Silty Gravel)
			Excavator refusal in Shale Bedrock at 2.7 feet	
RY-SS-03	Repository 2	14.0	0 – 2	Topsoil / Colluvium – Silty Gravel, trace Sand, Silt, & organics
			2.0 – 14.0	Weathered Shale Bedrock – Silty, Clayey Cobbles and Gravel Difficult excavating at 11 feet
			Excavator refusal due to difficult digging at 14.0 feet	
RY-SS-04	Repository 2	10.5	0 – 1	Duff and Topsoil – well graded Gravel, with Silt and organics
			1 – 3	Colluvium – Silty Sand with Cobbles & Gravel
			3.0 – 10.5	Weathered Bedrock – Silty, Clayey Cobbles & Gravel, with Sand Difficult excavating at 8 feet
			Shale Bedrock at 10.5 feet	
RY-SS-05	Repository 3	5.0	0 – 0.5	Topsoil – Sandy Silt, with organics
			0.5 – 2.0	Weathered Bedrock – Silty Gravel, with Cobbles, trace organics
			2.0 – 5.0	Weathered Fractured Bedrock (fractures are silt coated) – Well graded Gravel, with Cobbles
			Excavator refusal in Shale Bedrock at 5 feet	
CML-TS-11	Combination Mill Repository	14.5	0 – 1.5	Sandy Silt, with Gravel
			1.5 – 14.5	Clayey Gravel, with Sand and Cobbles
			Groundwater encountered at ~ 5 feet	

A summary of subsurface conditions observed during boring installations are presented in Table 7-5. The information presented in Table 7-5 represents interpretation of the contents of the field logs and the results of laboratory testing. Soil descriptions were classified in accordance with American Society for Testing and Materials (ASTM) D-2488, “Standard Recommended Practice for Description of Soils (Visual-Manual Procedure)”.

Table 7-5. Proposed Repository 2 Boring Data Summary

Location	Total Depth (feet)	Depth Interval (feet) / Material Description	
MW-RY-06	28	0 – 2	Gravelly Silt, trace Sand
		2 – 2.5	Gravel
		2.5 – 11.5	Highly Weathered Shale – Lean Clay, with Gravel
		11.5 – 17	Highly Weathered Shale – Gravelly Lean Clay
		17 – 25.5	Weathered Shale – Gravelly Silt
		25.5 – 28	Shale
MW-RY- 07	26	0 – 0.5	Topsoil – Gravelly Silt, with Sand and organics
		0.5 – 3	Gravely Silt, with Lean Clay
		3 – 10	Highly Weathered Shale – Lean Clay with Gravel
		10 – 18	Highly Weathered Shale – Gravelly Lean Clay
		18 – 22	Weathered Shale – Lean Clay, with Gravel
		22 – 26	Weathered Shale Bedrock
MW-RY- 08	10	0 – 0.5	Topsoil – Gravelly Silt with organics
		0.5 – 3.5	Highly Weathered Shale – Silty Gravel
		3.5 – 4.5	Highly Weathered Shale – Gravelly Silt
		4.5 – 6.5	Weathered Shale – Silty Gravel
		6.5 – 9	Weathered Fractured Shale
MW-RY-09	32	0 – 0.2	Topsoil and Duff – Silty Gravel, with organics
		0.2 – 4.5	Silty Gravel, with Cobbles
		4.5 – 20.5	Highly Weathered, Fractured Siliceous Shale – fractures are heavily coated with Silt
		20.5 – 32	Weathered Fractured Shale

Differences in the depth to bedrock were observed in the borings completed near Repository 2 as compared to the test pits excavated in this area. The depth to bedrock observed during the borings was deeper than the depth measured in the test pits. The discrepancy in observed bedrock depth is attributed to the twisting of the augers into the weathered bedrock which cuts through and creates what appears to be a silty or clayey soil (silt and clay sized particles are the main components of shale). The twisting of the augers into the ground disturbs the soil and weathered

bedrock and does not provide representative samples of the actual subsurface conditions. A test pit adjacent to an auger boring would show that the weathered bedrock is encountered closer to the surface. Therefore, the test pit observations are considered more representative of the subsurface conditions and are relied upon for the subsurface descriptions provided at the proposed Repository 2 site, where test pitting and borings were both performed.

7.3.1.1 Repository 1

The topsoil horizon at the Repository 1 area was observed to range from non-existing in test pit RY-SS-01 up to a thickness of 6-inches in test pit RY-SS-02. The topsoil layer in test pit RY-SS-02 was composed of highly fractured weathered shale where the fractures were filled with silt. Beneath the topsoil horizon, weathered shale was observed. In test pit RY-SS-01, the weathered shale layer was well graded gravel, with silt, sand, and cobbles to a depth of 4.2 feet bgs. Beneath the weathered shale, shale bedrock was encountered and the excavator could not dig further. This test pit was terminated at a depth of 4.3 feet bgs. In test pit RY-SS-02, the weathered shale layer is recorded as fractured weathered shale with silt filling the fractures. Excavator refusal in RY-SS-02 was at a depth of 2.7 feet bgs.

7.3.1.2 Repository 2

As stated in section 7.1.2, the Repository 2 site is located within a topographic bowl. In this bowl, the residual soils are being transported by gravity and slope wash to create a soil layer called colluvium. A topsoil layer was also observed. In test pit RY-SS-03, the topsoil is a combination of topsoil and colluvium described as silty gravel, with trace sand and roots that extended to a depth of two feet bgs. In test pit RY-SS-04, the topsoil is covered by a thin duff layer with the topsoil composed of well graded gravel with silt and decomposing organics that extended to a depth of 10 inches bgs. The colluvium in test pit RY-SS-04 was silty sand with cobbles and gravel that extended to a depth of three feet bgs. Beneath the colluvium, weathered shale was encountered at a depth of two feet in test pit RY-SS-03 and three feet in test pit RY-SS-04. The weathered shale was a silty, clayey cobbles and gravel. The test pits were terminated in the weathered shale at a depth of 14 feet bgs in test pit RY-SS-03 and 10.5 feet bgs in test pit RY-SS-04.

7.3.1.3 Repository 3

The topsoil horizon in test pit RY-SS-05 had a thickness of six inches and is composed of sandy silt. Beneath the topsoil, weathered bedrock layers were encountered. The first layer was composed of silty gravel with cobbles and extended to a depth of two feet bgs. Beneath the silty gravel was well graded gravel with cobbles. This layer was weathered, fractured shale bedrock. The test pit was terminated in this layer at a depth of five feet bgs.

7.3.1.4 Combination Mill Repository

As stated in section 7.1.4, this potential repository site was previously used as a borrow area. A topsoil layer was not observed in CML-TS-11. Surface soils were observed to consist of sandy silt with gravel that extended to a depth of two feet bgs. Beneath the sandy silt was clayey gravel

with sand and cobbles. Excavation was terminated in this layer at a depth of 14.5 feet bgs. Bedrock was not encountered in this test pit.

7.3.2 Groundwater

The test pits were monitored while excavating and after completion for the presence and level of groundwater. Groundwater was not observed in the test pits at the Repository 1 site. A groundwater seep was encountered within test pit RY-SS-04, located along the proposed northern perimeter of Repository 2 area, at a depth of approximately 2.75 feet bgs. This wet seam was confirmed in an un-named test pit excavated between RY-SS-04 and MW-RY-07. Soils were observed to be damp throughout the entire depth, approximately 13 feet bgs, of test pit RY-SS-03 located along the southern perimeter of the Repository 2 area but no flow into the test pit was observed. Groundwater was observed at a depth of approximately five feet bgs in test pit CML-SS-11, the test pit located in the proposed Combination Mill Repository site.

The borings were monitored during drilling and after completion for the presence and level of groundwater. Groundwater was not observed in the borings and has not been observed to date in the monitoring wells. However, this does not necessarily mean the borings were terminated above the water table. A relatively long period of time may be necessary for a groundwater level to develop and stabilize in the boreholes.

Groundwater levels may fluctuate several feet with seasonal and rainfall variations and with changes in the water level in adjacent drainage features. Normally, the highest groundwater levels occur in late winter and spring and the lowest levels occur in late summer and fall. However, saturated soils or oxidized soil zones indicative of seasonally high groundwater were not observed in the test pits or samples taken from the borings, and the subsurface soils appeared well-drained. The exceptions were test pit RY-SS-04 and CML-SS-11.

7.3.2.1 Repository 1

Groundwater was not observed in the test pits excavated in the proposed Repository 1 area. As a result of the shallow bedrock, this area was not deemed to be a viable repository location and no borings/monitoring wells were installed.

7.3.2.2 Repository 2

With the exception of the seep noted in test pit RY-SS-04, damp soils observed in test pit RY-SS-03, and borings installed in the area, no evidence of groundwater was observed during the Repository 2 investigation. No groundwater has been observed in the monitoring wells installed at this site to date. Based on the location of Repository 2 at the head of Mill Gulch, shallow groundwater during spring snowmelt may be encountered. As Repository 2 appears to be the best suited repository location of those investigated, groundwater levels should continue to be monitored. To observe the spring 2012 runoff event and anticipated high groundwater level, transducers were installed in wells MW-RY-07 and MW-RY-09 during January 2012. These transducers are also anticipated to provide information on how fast the groundwater level rises with the spring runoff event and how quickly the groundwater dissipates. This information will

be useful for repository design purposes and provide information related to water pressures and slope stability.

7.3.2.3 Repository 3

Groundwater was not observed in the test pit excavated in the proposed Repository 3 area. As a result of the shallow bedrock, this area was not deemed to be a viable repository location and no borings/monitoring wells were installed.

7.3.2.4 Combination Mill Repository

Groundwater was observed at a depth of five feet in the test pit excavated in the proposed Combination Mill Repository. As a result of the shallow groundwater depth in this area, the site was not deemed to be a viable repository location and no borings/monitoring wells were installed.

7.4 Laboratory Testing Summary

Representative portions of the samples from test pits and borings were placed in plastic bags. Larger bulk samples from each test pit were placed in 5-gallon plastic buckets and transported to Pioneer Technical Services, Inc.'s laboratory for classification and testing. Index tests were performed to develop parameters for use in evaluating subsurface conditions and estimating soil engineering properties. The tests included visual classification, moisture content, grain size distributions, specific gravity, and moisture/density relationships. One permeability test was also performed. The sample collected from test pit CML-SS-11 is mislabeled in the geotechnical laboratory reports as CMN-TS-11. The laboratory test data sheets are included in Appendix H.

In addition to geotechnical testing, soil samples from the repository sample locations were submitted to Pace Analytical for analysis of total recoverable metals, ABA, and agronomic soil properties. The results of agronomic testing are discussed in Section 4.2, Agricultural Analyses.

7.4.1 Soil Analytical Results

7.4.1.1 Total Recoverable Metals Results

Seventeen soil samples, including nine surface samples and eight subsurface samples, were collected from the four repository areas and submitted for analytical testing. Sample locations are shown on Figure 2-12 (repository sample locations except for CML-SS-11) and Figure 2-7 (CML-SS-11). Total recoverable metals analytical results are summarized in Table 7-2. The complete analytical results for soil samples collected as part of the repository investigation are presented in Appendix B-12; the laboratory reports are provided in Appendix C.

The highest metals concentrations were detected in soil samples from test pit RY-SS-04, located along the northern edge of the proposed Repository 2 area. Detected concentrations of antimony, arsenic, cadmium, lead, zinc, and iron in the surface and two subsurface samples from this test

pit were higher than the average background concentrations (Table 3-1) for these metals. However, the detected concentrations in the samples from RY-SS-04 were approximately an order of magnitude lower than the elevated concentrations detected in waste rock samples from test pits HM-RS-02, HM-RS-03, HM-RS-06, and HM-RS-07 collected from the Harrison Shaft and Harper Shaft waste rock areas (Table 3-19).

Metals concentrations were similar across the four repository areas, except for antimony, arsenic, copper, and lead, which were higher in samples collected from the Repository 2 area. Concentrations for these metals were similar across samples collected from the other three potential repository areas.

The following summarizes comparison of detected metals concentrations in waste rock samples to DEQ RBCG (Table 7-2):

- Arsenic exceeded the site-specific 95th UCL (40.4 mg/kg) in the surface sample collected at RY-SS-04 (74.7 mg/kg), the sample collected from two to four feet bgs at RY-SS-04 (78.6 mg/kg), and the subsurface sample collected from MW-RY-08 (52.1 mg/kg). These results were five to ten times higher than the detected arsenic concentrations in other repository soil samples, and higher than the calculated average arsenic background concentration (22.2 mg/kg). Both of these sample locations are located along the northern edge of the potential Repository 2 area. The source for the elevated arsenic levels in these samples is not readily apparent. Test pit RY-SS-04 is downslope, but slightly cross gradient from the Harper Shaft, while boring MW-RY-08 is cross gradient from the Harper Shaft. However, both of these locations are near areas of surface exploration along the Combination Vein. The elevated arsenic levels could be a result of metals leaching from exposed source materials in these areas or dust from underground mining brought to the surface and distributed by the ventilation shafts in the area.

- Manganese exceeded the DEQ RBCG (665 mg/kg) in five of the 17 soil samples. These samples included the surface sample collected at RY-SS-02 (782 mg/kg), the surface sample (1,300 mg/kg) and sample from two to four feet bgs (992 mg/kg) collected at RY-SS-04, the surface sample collected at RY-SS-05 (1,040 mg/kg), and the surface sample collected from MW-RY-07 (1,840 mg/kg). The results from these samples also exceeded the calculated average background concentration (777 mg/kg); however, manganese is not listed as human health COC or an ecological COC. In addition, manganese is not known to be toxic to vegetation. Each of these samples represents native soil, although as noted for arsenic, the samples from RY-SS-04 may be impacted from surface exploration or scattered waste materials/dust. The Combination Mill Repository area was the only repository area without elevated manganese concentrations.

- Detected concentrations did not exceed the DEQ RBCG for other metals analyzed.

7.4.1.2 Acid Base Accounting Results

Thirteen soil samples collected as part of the repository investigation were analyzed for ABA. The results from the ABA analyses are tabulated in Table 7-3 and are summarized below:

- Sulfur levels in the samples were <0.05%.
- The acid potential was calculated at <4.3 t/kt to 0.2 t/kt.
- Neutralization potential ranged from 2 t/kt to 8.2 t/kt, excluding the result of 125 t/kt for the surface sample collected from RY-SS-02. The neutralization potential result for the sample from RY-SS-02 is more than an order of magnitude higher than other results across the BPM, and may be a result of inclusion of mineralized rock from the nearby Combination Mine vent shaft.
- The lime requirement was calculated at <5.4 t/kt to 8.6 t/kt.
- Acid base potential or net neutralization potential ranged from 1.8 t/kt to 8.2 t/kt, excluding the result of 124 t/kt for the surface sample collected from RY-SS-02.

The acid base potential or net neutralization potential for all except one of the samples (surface sample from RY-SS-02, 124 t/kt) falls within the -20 t/kt to +20 t/kt, which is considered to have uncertainty and the potential to generate acid exists (EPA 1994b). The result for the acid base potential for RY-SS-02 are high that is in line with the sample pH. The pH of this sample was 7.8 and therefore would demonstrate a higher neutralization potential than the other samples that have pH's between 5.8 and 7.3 S.U.

Lime amendments, if necessary, are low and would require a maximum of 8.6 tons of lime for every 1000 tons of waste. The ABA results were similar across repository areas, but varied with individual samples. For example the recommended lime varied from less than 5.4 t/kt to 8.2 t/kt for samples collected in the Repository 1 area; less 5.4 t/kt to 7 t/kt for the Repository 2 area; less than 5.4 t/kt to 8.6 t/kt for the Repository 3 area; and less than 5.4 t/kt to 1.5 t/kt at the Combination Mill Repository area.

7.4.2 Soil Classification

Soils were classified in accordance with the USCS, as specified in the ASTM D2487. Grain size distribution and hydrometer analyses (ASTM D422) and Atterberg limit tests (ASTM D4318) were performed on each of the repository soil samples. The particle grain size distribution was screened to remove material larger than three inches in diameter (cobbles). Only the soil fraction passing the 3-inch sieve was used for laboratory analysis. The percent of grain size content for sand, silt, and clay were then normalized to 100 percent for reporting. For the Atterberg limits tests, the soils were screened with the #40 sieve and the soil passing through the sieve was used for the tests. As a result of the screening and removal of oversized material from the samples, the geotechnical testing reports do not include the oversized materials in the soil classifications

descriptions. Soil classification test results are summarized in Table 7-6. USDA soil classification test results for the topsoil material are discussed in Section 4.1, Physical Analysis.

Table 7-6. Summary of USCS Classification Tests on Repository Soils

Location	Depth (feet)	Particle Size Distribution[a]			Atterberg Limits[b]	USCS Symbol
		% Gravel	% Sand	% Fines		
RY-SS-01	0-1.3	62.2	20.3	17.5	LL=34 PI=5	GM
RY-SS-01	1.3-2.7	72.7	22.0	5.2	LL=23 PI=3	GW-GM
RY-SS-02	0-0.5	85.9	6.7	7.4	LL=62 PI=10	GW-GM
RY-SS-02	0.5-2.7	61.7	10.8	14.1	LL=34 PI=6	GM
RY-SS-03	0-1.5	57.0	13.4	29.6	LL=22 PI=1	GM
RY-SS-03	13	41.8	10.5	23.4	LL=23 PI=5	GC-GM
RY-SS-04	0-1.5	80.9	12.6	6.5	LL=22 PI=2	GW-GM
RY-SS-04	8	43.5	17.9	38.5	LL=19 PI=4	GC-GM
RY-SS-05	0.5-1.5	70.9	12.1	16.9	LL=50 PI=7	GM
RY-SS-05	5	78.3	6.6	2.2	LL=21 PI=1	GW
CML-SS-11	8	37.8	26.9	35.3	LL=35 PI=21	GC
MW-RY-06	3-12	21.0	19.8	59.1	LL=46 PI=30	CL
MW-RY-07	0.5-3	39.9	25.5	34.7	LL=31 PI=1	GM
MW-RY-08	8-10	61.6	16.4	22.0	LL=19 PI=2	GM

[a] Percent by weight.
[b] Atterberg limits: LL=liquid limit; PI=plasticity index. Tests performed on soil passing the #40 sieve.

Inspection of the grain size distribution charts included in Appendix H indicates that the fraction of soils tested are generally gap graded. The curves are not smooth and flatten out in the sand range of particle sizes indicating that the gravel, silt, or clay fractions are better graded than the sand fraction of the soils. The particle size gap, along with the relatively large coarse-grained particle fraction, is an indication that the soils are not mature at the proposed repository sites.

7.4.3 Soil Moisture/Density Relationship

Eleven representative soil samples from the test pits and three composite samples from the borings were tested to determine the soil moisture/density relationship using the standard Proctor compaction method (AASHTO T99 Method C). The exceptions were the MW-RY-06 sample, which was tested using ASTM D698 Method A, and the samples from RY-SS-04, MW-RY-08, and CML-SS-11, which were tested using AASHTO T180 Method C. Both the AASHTO and ASTM standard Proctor compaction methods evaluate the moisture content and soil density compacted in a mold. The ASTM method requires that the portion of soil pounded into the mold

cannot be broken out of the mold, moisture adjusted, and re-used to calculate the next density point on the curve. The AASHTO method allows re-use of molded sample soil for the next density calculation, thus requiring a smaller sample volume. The laboratory had sufficient sample volume to perform the tests without re-using the soil for the MW-RY-06 sample. However, due to smaller sample sizes the laboratory used the AASHTO methods for the other samples so that the molded soil samples could be re-used to prepare the soil moisture/density curves.

Natural moisture contents were also determined. A comparison of the natural moisture content and the optimum moisture content of the compacted soil specimen provides an indication of moisture conditioning required when placing and compacting this material. Natural moisture contents and Moisture/Density test results are summarized in Table 7-7.

Table 7-7. Standard Proctor Moisture/Density Test Results for Repository Soils

Location	Depth (feet)	Maximum Dry Density (pcf)	Optimum Moisture Content (%)	Natural Moisture Content, %[a]
RY-SS-01	0-1.3	128	10.7	4.0
RY-SS-01	1.3-2.7	132.6	6.4	2.7
RY-SS-02	0-0.5	139.4	5.9	4.3
RY-SS-02	0.5-2.7	Material too coarse for Proctor test		6.8
RY-SS-03	0-1.5	131	7.9	3.8
RY-SS-03	13	131.1	9.6	10.1
RY-SS-04	0-1.5	135.5	6	7.5
RY-SS-04	8	138.4	5.9	5.5
RY-SS-05	0.5-1.5	115.8	9.5	4.2
RY-SS-05	5	Material too coarse for Proctor test		4.1
MW-RY-06	3-12	116.6	14.4	14.5
MW-RY-07	0.5-3	Sample volume too small for Proctor test		6.4
MW-RY-08	8-10	139.7	7.9	4.0
CML-SS-11	8	120.2	14.1	Not tested[b]

[a] Weight of water as a percentage of the weight of solids.

[b] Moisture content test requested, but not performed by the lab.

The sample analyses indicate that the natural moisture content of the soils ranges from 2.7% to 14.5% with an average of 6%. The range for samples collected from the Repository 2 area was from 3.8% to 14.5%.

The maximum dry density and optimum moisture, as determined by standard Proctor, for the samples obtained at the proposed Repository 2 ranged from 116.6 to 139.7 pounds per cubic foot (pcf) at 14.4% to 7.9% moisture, respectively. The maximum dry density and optimum moisture content at Repository 1 and Repository 3 ranged from 115.8 pcf (Repository 3) to 139.4 pcf (Repository 1) at 9.5% to 5.9% moisture, respectively. For the proposed Combination Mill Repository, the maximum dry density was 120.2 pcf at an optimum moisture content of 14.1%.

7.4.4 Permeability Testing

Permeability testing was performed on one composite sample from boring MW-RY-06. This sample was the only fine-grained soil layer encountered suitable for testing during the repository investigations. The sample was compacted to 95% of its optimum moisture and density. The soil type tested was gravelly lean clay with sand obtained from drilling cuttings brought to the surface while advancing borehole MW-RY- 06. This borehole is located within the proposed Repository 2 area. The permeability of the remolded sample was 6.3×10^{-7} centimeters per second (cm/s).

7.4.5 Geotechnical Properties of the Mine Wastes

Select impacted soils and waste rock were submitted for geotechnical testing to determine properties that will be used in designing the waste placement strategy in the repository (e.g., dewatering/moisture conditioning, and compaction). The waste placement strategy is important to determine the long-term stability of the repository. Geotechnical tests were not performed on impacted materials in the Combination Mill AOC due to potentially high mercury levels that were a safety concern for individuals performing the tests. However, moisture tests were completed as part of the analytical testing and observations of soils materials were made during test pitting/soil sampling. The mine wastes are comprised largely of gravels and cobbles, with smaller amounts of finer-grained material. Waste rock and impacted soils will require drying prior to placement in the repository, while saturated materials in the Combination Mill AOC will likely require dewatering or physical stabilization prior to placement in the repository. Geotechnical test results for mine wastes are discussed in further detail in the following sections.

7.4.5.1 Waste Rock and Soils

Geotechnical tests were performed on two potentially impacted soil samples and three waste rock samples obtained from the Combination Mine, Tim Smith Mine, and Historic Mine AOC's. Soil samples were collected from the North (CMN-SS-09) and South (CMN-SS-11) Combination Mine Soils Removal Areas. Waste rock samples were collected from the Tim Smith No. 1 waste rock pile (TS-RS-01), Harper Shaft waste rock area (HM-RS-01), and Harrison Shaft waste rock area (HM-RS-06). The waste rock samples were analyzed for their geotechnical properties using the same methods described in Section 7.4.2 and Section 7.4.3. The geotechnical test results are summarized in Tables 7-8 and 7-9. Complete test results are provided in Appendix H.

Table 7-8. Summary of USCS Classification Tests for Waste Rock Materials

Location	Depth (feet)	Particle Size Distribution[a] % Gravel	% Sand	% Fines	Atterberg Limits[b]	USCS Symbol
CMN-SS-09	0-1	49.2	24.2	26.5	LL=26 PI=5	GC-GM
CMN-SS-11	0-1	30.0	30.9	39.1	LL=16 PI=1	SM
TS-RS-01	4-6	56.4	32.6	10.9	Not Plastic	GW-GM
HM-RS-01	5	41.0	17.6	41.4	LL=36 PI=21	GC
HM-RS-06	1-3	63.2	16.9	19.9	LL=20 PI=2	GM

[a] Percent by weight.
[b] Atterberg limits: LL=liquid limit; PI=plasticity index. Tests performed on soil passing the #40 sieve.

The soil samples for the Combination Mine Soils Removal Areas are classified as clayey gravel with sand, silty clayey gravel with sand, and silty sand with gravel. The Tim Smith waste rock sample was classified as well graded gravel with silt and sand. The Historic Mine samples were classified as silty gravel with sand (Harper Shaft waste rock) and clayey gravel with sand (Harrison Shaft waste rock). Review of the Atterberg Limits tests indicates that the fine-grained soil and waste rock materials are not expansive. Review of the grain size distribution charts included in Appendix H indicates that the fractions of soils tested are generally gap graded. The curves are not smooth and flatten out in the sand range of particle sizes indicating that the gravel, and silt or clay ranges are better graded than the sand fraction of the soils.

Table 7-9. Standard Proctor Moisture/Density Test Results for Waste Rock Materials

Location	Depth (feet)	Maximum Dry Density (pcf)	Optimum Moisture Content (%)	Natural Moisture Content %[a]
CMN-SS-09	0-1	118.0	12.3	16.4
CMN-SS-11	0-1	128.5	9.1	Not tested[b]
TS-RS-01	4-6	135.5	7.6	Not tested[b]
HM-RS-01	5	121.9	12.8	16.1
HM-RS-06	1-3	134.9	7.8	10.5

[a] Weight of water as a percentage of the weight of solids.
[b] Moisture content test requested, but not performed by the lab.

The maximum dry density and optimum moisture, as determined by standard Proctor (AASHTO T99C), range from 118 to 135.5 pcf at 12.3% to 7.6% moisture, respectively, with an average of 126.5 pcf at 10.6% moisture. The sample analysis indicates that the natural moisture content of the soils ranges from 10.5% to 16.4% with an average of 14.3%. The moisture contents of the tested waste rock piles were observed to be approximately twice as much as the moisture content of the native soils. This may be due to the slightly higher silt and clay content of the soils.

The majority of the soil and waste rock tested, 30% to 63%, consist of gravels. The soil and waste rock samples were generally classified as gravels; however, the cobble content was screened from the samples prior to analysis. Cobbles and boulders should be anticipated within the waste rock. To achieve optimum moisture for compaction of the material within a repository, the waste rock will need to be dried slightly.

7.4.5.2 Sediments and Tailings

Geotechnical testing was specified in the RWP for tailings materials at the Combination Mill AOC. However, this geotechnical testing was not performed on sediment or tailings materials near or downstream of the Combination Mill site due to concerns with unknown, potentially high, mercury levels. The potentially high mercury levels were a safety concern for individuals performing the geotechnical tests. Instead, the RI focused on characterizing the approximate extent and levels of contamination in the sediments and tailings. The geotechnical properties of the sediments and tailings will be addressed in subsequent project phases.

Moisture content was measured as part of the analytical testing performed by Pace Analytical. Moisture contents for sediment, soil, and tailing samples from the Combination Mill AOC are provided in Appendix B-8. Moisture content ranged from 8.2% to 40.1% for tailings samples, from 13.1% to 42.4% for soil samples, and from 3.8% to 67.7% for sediment samples. Depending on location and depth, materials excavated from the Combination Mill AOC will require dewatering and or stabilization prior to placement in a repository.

7.5 Conclusions and Recommendations

7.5.1 General

Site observations, subsurface data, and preliminary geotechnical engineering evaluations were performed to evaluate the possibility of siting and constructing a long-term waste storage repository within four proposed locations at the BPM. Based on results from preliminary investigations the proposed Repository 2 area appears to be a better alternative as compared with the proposed Repository 1, Repository 3, and Combination Mill repository area for long-term storage. Bedrock is present near the surface across the Repository 1 site, limiting the ability to excavate a repository, and greatly increasing construction costs if a below grade repository is required. Similarly, shallow bedrock exists within the Repository 3 area that would limit or prevent excavation and increase repository costs. Shallow groundwater, distance to the Combination Mine waste rock pile, and limited storage would be a concern for the Combination Mill Repository area.

7.5.2 Groundwater

A hydrogeologic investigation was not performed as part of the current scope of work and groundwater level data is limited to observations made while test pitting and during borehole installation. No groundwater was detected in the monitoring wells installed in the Repository 2 area. A wet soil seam was encountered in test pit RY-SS-04 at a depth of 2.75 feet bgs. This wet seam was confirmed in an un-named test pit excavated between RY-SS-04 and MW-RY-07. Other than the wet soil seam in RY-SS-04, other evidence of seasonal groundwater influence was not observed in the test pits or borings. Seasonal groundwater elevations may fluctuate several feet with seasonal and rainfall variations and with changes in the water level in adjacent drainage features. However, seasonal groundwater levels are expected to be below the depths of the current explorations. Continued attempts at groundwater measurements in the monitoring wells installed in the Repository 2 area are recommended to be performed on at least a quarterly basis, particularly during spring thaw when the groundwater levels are anticipated to be highest.

Groundwater was not observed in test pits excavated in the Repository 1 or Repository 3 areas. No groundwater wells were installed in these repository areas as they were eliminated from further investigation based on shallow bedrock. Groundwater was observed at a depth of five feet bgs in the test pit excavated in the Combination Mill Repository area. Based on the shallow depth to groundwater, this repository area was eliminated from further investigation.

7.5.3 Soils

The majority of proposed Repository 1 soils, 62% to 86%, consist of gravels. The surface soils from RY-SS-02 had expansive properties (swells and shrinks in response to changes in moisture). Proposed Repository 1 soils cannot serve as a cover soil source or be used as liner material or a bedding source, even with amendments. Soils from proposed Repository 1 may be suitable for construction of repository retention berms with little additional amendments. To achieve optimum moisture for compaction, the material within the proposed Repository 1 location would require minor moisture adjustment.

The majority of proposed Repository 2 soils, 42% to 81%, consist of gravels. Soils from proposed Repository 2 area would be suitable for construction of repository retention berms, and select areas with lower gravel content may be suitable for cover soil. To achieve optimum moisture for compaction, the material within the proposed Repository 2 area would require minor moisture adjustment. The geochemical properties of the soils do not appear to limit their use as borrow or for the construction of a repository. These soils could also be used for constructing a staging/processing (dewatering or stabilizing) area for the tailings, if appropriate, prior to placement in the repository. The only exceptions are the upper four feet of the soils in the area of RY-SS-04 and upper one foot in the area of boring MW-RY-08, both located in the Repository 2 area, where arsenic levels exceeded the DEQ RBCG and the calculated mean background soil concentration. Manganese concentrations also exceed the DEQ RBCG and the calculated mean background soil concentration, but it is not listed as a COC or considered toxic to vegetation.

The fine-grained portion of the surface soils from test pit RY-SS-05 (proposed Repository 3 area) are borderline expansive with a liquid limit of 50. These soils have a gravel content that is in excess of 70%. If needed, the soils from the Repository 3 area could be useful as a source of road material.

Review of the soils properties from samples collected within the proposed Combination Mill Repository area indicates that the soils may be suitable to use to construct repository retention berms. The geochemical properties of this soil were below DEQ RBCG; however, the subsurface sample (eight to 10 feet bgs) had the highest measured concentration of mercury (6.8 mg/kg) of all the repository samples.

7.5.4 Hydrologic Barrier Materials

Sufficient quantities of fine-grained soils, such as silt or clay or clayey sand, considered suitable for use as a hydrologic barrier were not found at the site. Site soils were screened to remove cobbles and gravels to classify the fine-grained particles. The geotechnical testing reports show that the soils have a relatively large percentage of coarse-grained particles such as sand, gravel, and cobbles. The fine-grained material that was tested had a permeability of 6.3×10^{-7} cm/s, as discussed in Section 7.4.4. Native soils would require screening and amendments to serve as liner material. Due to the large percentages of coarse-grained materials, a significant amount of onsite soil would require screening to provide suitable soil liner material.

The most common failure mechanism of repositories and retaining structures is water. Water can erode covers, infiltrate into a repository, and increase soil pore pressures to the point where the stability is compromised and a slope failure may occur. Infiltrating water may also oxidize waste materials and mobilize metals that could affect downgradient water quality. For a long-term repository with approximately 400,000 cubic yards of waste, providing separation from surface and groundwater will be critical. Alternatives to achieve this separation should be considered as part of further investigations at the Repository 2 site. Additional groundwater level information is also required to determine the seasonal high groundwater level at the Repository 2 site and its potential impact on the repository design.

7.5.5 Waste Materials

The geotechnical properties of the Combination Mine AOC soils, and Tim Smith Mine AOC and Historic Mine AOC waste rock material are similar to the native soils tested at the repository locations. Where slight moisture adjustments would be required to compact the native soils, the impacted soil and waste rock will need to be dried slightly to be placed at optimum moisture and density.

Geotechnical testing was not performed on tailings or sediment samples based on concerns with potentially high mercury levels. However, based on observations during test pitting and moisture contents measured as part of analytical testing, these materials are highly saturated and will likely require drying or mixing with other materials (e.g., lime products, waste rock, impacted soils, etc.) prior to placement and compaction in a repository.

7.5.6 Dewatering and Stormwater Management

Based on the observed subsurface soil and groundwater conditions, the need for dewatering during repository construction is not anticipated. Stormwater best management practices should be implemented during construction and while new vegetation is established.

7.6 Recommended Additional Investigations for Repository Design

The volume of tailings, impacted soils and sediments, and waste rock is estimated at 400,000 cubic yards. The available repository acreage, occurrence of seasonal springs or seeps, shallow depth to bedrock, and existence of underlying mine workings will dictate the footprint, height, and other design parameters of the repository in order to accommodate and safely store the volume of mine waste. Since the mine waste may be placed on bedrock, additional design considerations are appropriate for slope stability considerations. Bearing on the bedrock will increase the design requirements to maintain an acceptable factor of safety against slope failures within the repository.

Infiltrating water and poor construction quality are the main causes of repository slope failures. Continued groundwater monitoring is recommended in the monitoring wells MW-RY-06, MW-RY-07, MW-RY-08, and MW-RY-09 installed near proposed Repository 2. The groundwater depth readings should be made at least quarterly, with increasing frequency (weekly or monthly) during the spring thaw to measure the seasonal high groundwater level. Due to the remoteness of the site, transducers were installed in MR-RY-07 and MW-RY-09. These transducers provide an economical means to monitor the groundwater levels and limit the number of site visits. The groundwater level information collected with the transducers will provide details regarding the fluctuations in groundwater levels, if any, prior to constructing a repository so the design may account for influences from groundwater, and reduce the likelihood of slope failures and generation of acidic seeps. Onsite observations of the proposed repository area during the spring thaw are also important. Stormwater runoff over the site should be observed, and the presence of seasonal springs or seeps in the potential repository area should be documented.

An additional subsurface investigation is recommended for the proposed Repository 2 site, including testing to establish the triaxial shear strengths of the site soils. Additional geotechnical testing, including triaxial shear strength, is also recommended for the tailings, impacted sediments, and waste rock. These tests will provide slope stability design information for the maximum slope angles the materials can support, proper handling of the wastes, and for sequencing waste placement in the repository. Coring of the bedrock is also recommended to provide information on the rock quality (how intact or fractured the bedrock is), existence of thin stratified layers (which may be a failure mechanism), existence of shallow faults, depth of shallow or unknown mine workings, and to indicate historic ranges of depths to groundwater. These additional investigations are important inputs for an appropriate repository design that minimizes operations and maintenance costs, maintains public safety, and improves the life of the repository.

Due to the cobble and gravel content of the proposed repository site soils, additional investigations for suitable cover soil and bedding material, if appropriate, may be necessary. Additional proposed repository investigations are summarized in Table 7-10.

Table 7-10. Additional Recommended Repository Investigations

Additional Field Investigations [a]	Justification
Groundwater Level Monitoring	Monitoring will determine the range of fluctuation of groundwater at the proposed repository site.
Repository 2 Subsurface Investigation	The investigation will evaluate slope stability, factors of safety, site the repository, and provide information for the design of the repository.
Evaluate Mine Maps	Mine maps will be georeferenced to the base map and used to determine the depth to mine workings within the proposed repository footprint to determine impacts to the repository.
Repository Cover Soil Source	Soil sources close to the site will be identified to limit construction costs.

[a] This table is not all inclusive and additional tests may be appropriate to prepare the repository design.

8.0 Reclamation Objectives and Goals

The overall objective of reclaiming impacted areas of the BPM is to protect human and ecological health in accordance with the guidelines set forth by the MDEQ/AMLB. Specifically, site reclamation must limit human and ecological exposure to mine-related contaminants and reduce the mobility of those contaminants through associated solid media and surface water exposure pathways.

DEQ has developed a conservative set of RBCGs for contaminants using a recreational visitor gold panner/rock hound exposure pathway scenario. The guidelines take into account the possibility of exposure through various routes. Action levels have been determined for the BPM based on the RBCG.

The results provided in this RI report are to be used as a tool as part of the risk mitigation decision-making process. Data users should use the human health and ecological risk assessments to determine whether reclamation is needed to reduce risks at the BPM and in the South Fork Lower Willow Creek and Smart Creek drainage basins. The following sections provide additional interpretation of project data and the regulatory framework under which future site actions may take place.

9.0 Preliminary Applicable or Relevant and Appropriate Requirements

Applicable or relevant and appropriate requirements (ARARs) are categorized as either contaminant-specific requirements that define acceptable exposure limits, as location-specific requirements that may set restriction activities at a location, or as action-specific requirements that may set controls or restrictions for a particular treatment or disposal activity for the proposed response. ARARs assist in the development and selection of reclamation remedies.

Applicable requirements address a specific hazardous substance, pollutant, or contaminant; remedial action, location, or other circumstances. Relevant and appropriate requirements address problems or situations sufficiently similar to those encountered at another site. The DEQ/AMLB has developed a summary of federal and state ARARs for reclamation projects that apply to the BPM. Table 9-1 includes a list of these ARARs and indicates whether each ARAR is likely to be applicable, possibly applicable, or not likely applicable to the reclamation project.

Table 9-1. Preliminary Applicable or Relevant and Appropriate Requirements for the Black Pine Mine

ARARs	Likely ARAR	Possible ARAR	Not Likely ARAR
Federal Contaminant-Specific ARARs			
Safe Drinking Water Act			
Safe Drinking Water Act, 42 U.S.C. 300f, *et seq.*, National Primary and Secondary Drinking Water Regulations, 40 CFR Parts 141 and 142 (relevant and appropriate)			X
Clean Water Act			
Federal Surface Water Quality Requirements, Clean Water Act, 33 U.S.C. 1251, *et seq.* (applicable)	X		
National Ambient Air Quality Standards			
National Ambient Air Quality Standards, 40 CFR 50.6 (PM-10); 40 CFR 50.12 (lead) (applicable)	X		
State Contaminant-Specific ARARs			
Groundwater Protection			
Application of Groundwater Standards and Basis for Classifications, ARM 17.30.1005 (applicable)		X	
Classification, Beneficial Uses and Specific Standards for Groundwater, ARM 17.30.1006 (applicable)		X	
Nondegradation, ARM 17.30.1011 (applicable)		X	
Montana Water Quality Act			
State of Montana Surface Water Quality Requirements, Montana Water Quality Act, Section 75-5-101, *et seq.*, MCA, and implementing regulations (applicable)	X		
General Prohibitions, ARM 17.30.637 (applicable)	X		
Prohibited Activities, Section 75-5-605, MCA (applicable)	X		
Nondegradation Policy, Section 75-5-303, MCA (applicable)	X		
Nondegradation Policy, Applicability and Level of Protection, ARM 17.30.705 (applicable)	X		
Montana Ambient Air Quality Regulations			
Montana Ambient Air Quality Regulations, ARM 17.8.206, -.220, -221, -.222, -.223 (applicable)	X		
Methods and Data, ARM 17.8.206 (applicable)	X		
Settled Particulate Matter, ARM 17.8.220 (applicable)	X		
Visibility, ARM 17.8.221 (applicable)	X		
Lead, ARM 17.8.222 (applicable)	X		
PM-10, ARM 17.8.223 (applicable)	X		

ARARs	Likely ARAR	Possible ARAR	Not Likely ARAR
Federal Location-Specific ARARs			
National Historic Preservation			
National Historic Preservation Act, 16 USC 470, 40 CFR 6.301(b), 36 CFR Part 63, Part 65, and Part 800 (NHPA) (applicable)		X	
Archaeological and Historic Preservation Act			
Archaeological and Historic Preservation Act, 16 USC 469, 40 CFR 6.301(c) (applicable)	X		
Historic Sites Act of 1935			
Historic Sites Act of 1935, 16 USC 461, *et seq.*, 40 CFR 6.310(a) (applicable)	X		
Protection and Enhancement of the Cultural Environment			
Executive Order 11593 Protection and Enhancement of the Cultural Environment, 16 USC 470 (applicable)	X		
The Archeological Resources Protection Act of 1979			
The Archeological Resources Protection Act of 1979, 16 USC 470aa-47011 (relevant and appropriate)	X		
American Indian Religious Freedom Act			
American Indian Religious Freedom Act, 42 USC 1996, *et seq.* (applicable)			X
Native American Graves Protection and Repatriation Act			
Native American Graves Protection and Repatriation Act, 25 USC 3001 *et seq.* (applicable)			X
Fish and Wildlife Coordination Act			
Fish and Wildlife Coordination Act, 16 USC 661, 40 CFR 6.302 (applicable)		X	
Endangered Species Act			
Endangered Species Act, 16 USC 1531, 50 CRF Parts 17 and 402 (applicable)		X	
Floodplain Management Regulations			
Floodplain Management Regulations, Executive Order No. 11988 and 40 CFR 6.302(b) (applicable)	X		
Protection of Wetlands Regulations			
Protection of Wetlands Regulations, 40 CFR Part 6, Appendix A, and Executive Order No. 11990 (applicable)	X		

ARARs	Likely ARAR	Possible ARAR	Not Likely ARAR
Clean Water Act			
Section 404, Clean Water Act, 33 USC 1251 *et seq.*, 33 CFR Part 330 (applicable)	X		
Migratory Bird Treaty Act			
Migratory Bird Treaty Act, 16 USC 703, *et seq.* (applicable)		X	
Bald Eagle Protection Act			
Bald Eagle Protection Act, 16 USC 668, *et seq.* (applicable)		X	
Resource Conservation and Recovery Act			
Resource Conservation and Recovery Act and Regulations, 40 CFR 264.18 (a) and (b) (relevant and appropriate)	X		
State Location-Specific ARARs			
Montana Antiquities Act			
Montana Antiquities Act, Section 22-3-421, *et seq.*, MCA (relevant and appropriate)	X		
Montana Human Skeletal Remains and Burial Site Protection Act			
Montana Human Skeletal Remains and Burial Site Protection Act (1991), Section 22-3-801, *et seq.*, MCA (applicable)		X	
Montana Floodplain and Floodway Management Act			
Montana Floodplain and Floodway Management Act and Regulations, Section 76-5-101 *et seq.*, MCA, ARM 36.15.601 *et seq.* (applicable)	X		
Montana Stream Protection Requirements			
Montana Natural Streambed and Land Preservation Act of 1975 and Regulation, Section 75-7-101, *et seq.*, MCA, and ARM 36.2.401, *et seq.* (applicable)	X		
Standards and Guidelines, ARM 36.2.410 (applicable)	X		
Sections 87-5-502 and 504, MCA (applicable -- substantive provisions only)	X		
Montana Solid Waste Management Act and Regulations			
Montana Solid Waste Management Act and Regulations, Section 75-10-201, *et seq.*, MCA, ARM 17.50.101, *et seq.* (applicable)	X		
Floodplains, ARM 17.50.1004 (applicable)	X		
Wetlands, ARM 17.50.1005 (applicable)		X	
Fault Areas, ARM 17.50.1006 (applicable)	X		

ARARs	Likely ARAR	Possible ARAR	Not Likely ARAR
Seismic Areas, ARM 17.50.1007 (applicable)	X		
Unstable Areas, ARM 17.50.1008 (applicable)	X		
Location Restrictions, ARM 17.50.1009 (applicable)	X		
Section 75-10-212, MCA (applicable)	X		
Endangered Species and Wildlife			
Endangered Species and Wildlife		X	
Section 87-5-106, 107, and 111, MCA (applicable)		X	
Action-Specific ARARs			
Federal and State Water Protection Requirements			
Clean Water Act			
Clean Water Act, Point Source Discharges Requirements, 33 USC 1342 (applicable, substantive provisions only)	X		
Montana Pollutant Discharge Elimination System Requirements			
Montana Pollutant Discharge Elimination System Requirements	X		
Substantive MPDES Permit Requirements, ARM 17.30.1342-1344 (applicable)	X		
Technology-Based Treatment, ARM 17.30.1203 and 1344 (applicable)	X		
Montana Water Quality Act and Regulations			
Causing of Pollution, Section 75-5-605, MCA (applicable)	X		
Nondegradation, Section 75-5-303, MCA (applicable)	X		
Surface Water, ARM 17.30.637 (applicable)	X		
Nondegradation Policy - Application and Level of Protection, ARM 17.30.705 (applicable)	X		
Nondegradation, ARM 17.30.1011 (applicable)	X		
Stormwater Runoff Control Requirements			
Water Quality Performance Standards, ARM 17.24.633 (applicable)	X		
General Permits, ARM 17.30.1341 (applicable)	X		
Federal and State RCRA Subtitle C Requirements			
Federal and State RCRA Subtitle C Requirements, 42 USC Section 6921, et seq. (relevant and appropriate for solid wastes, applicable for hazardous wastes)	X		
40 CFR Part 264 Subpart F, (relevant and appropriate)	X		
General Facility Standards:			
40 CFR 264.92, .93, and .94 (relevant and appropriate)	X		

ARARs	Likely ARAR	Possible ARAR	Not Likely ARAR
40 CFR 264.97 (relevant and appropriate)	X		
40 CFR 264.98 (relevant and appropriate)	X		
Closure Requirements			
40 CFR 264.111 (relevant and appropriate)	X		
40 CFR 264.117 (relevant and appropriate)	X		
40 CFR 264.310 (relevant and appropriate)	X		
40 CFR 264.301 (relevant and appropriate)	X		
40 CFR 264.301(a) (relevant and appropriate)	X		
40 CFR 264.301(f) (relevant and appropriate)	X		
40 CFR 264.301(g) (relevant and appropriate)	X		
40 CFR 264.301(h) (relevant and appropriate)	X		
40 CFR 264.301(i) (relevant and appropriate)	X		
Federal and State RCRA Subtitle D and Solid Waste Management Requirements			
Federal Requirements			
40 CFR 257 (applicable)		X	
40 CFR 257.3-1 (applicable)		X	
40 CFR 257.3-2 (applicable)		X	
40 CFR 257.3-3 (applicable)		X	
40 CFR 257.3-4 (applicable)		X	
40 CFR 257.3-8(d) (applicable)		X	
State of Montana Solid Waste Requirements			
The Montana Solid Waste Management Act, Section 75-10-201 *et seq.*, MCA, and regulations (applicable)	X		
Transportation, ARM 17.50.523 (applicable)	X		
Location Restrictions, ARM 17.50.1009(1)(c) (applicable)	X		
Design Requirements, ARM 17.50.1204 (applicable)	X		
Access Requirements, ARM 17.50.1108 (applicable)	X		
Run-On and Run-Off Control Systems, ARM 17.50.1109 (applicable)	X		
Surface Water Requirements, ARM 17.50.1110 (applicable)	X		
Liquid Restrictions, ARM 17.50.1111 (applicable)	X		
Operating Criteria, ARM 17.50.1116 (applicable)	X		
Closure Criteria, ARM 17.50.1403 (applicable)	X		
Post-Closure Criteria, ARM 17.50.1404 (applicable)	X		
Section 75-10-206, MCA (applicable)	X		

ARARs	Likely ARAR	Possible ARAR	Not Likely ARAR
Federal and State Mine Reclamation Requirements			
Surface Mining Control and Reclamation Act	X		
Surface Mining Control and Reclamation Act, 30 USC 1201-1326 (relevant and appropriate)	X		
Montana Statutory and Regulatory Requirements			
Montana Strip and Underground Mine Reclamation Act, Section 82-4-201, *et seq.*, MCA (relevant and appropriate) and Montana Metal Mining Act, Section 82-4-301, *et seq.*, MCA (relevant and appropriate)	X		
Section 82-4-231, MCA (relevant and appropriate)	X		
Section 82-4-233, MCA (relevant and appropriate)	X		
Section 82-4-336, MCA (relevant and appropriate)	X		
General Backfilling and Grading Requirements, ARM 17.24.501 (relevant and appropriate)	X		
Monitoring for Settlement, ARM 17.24.519 (relevant and appropriate)	X		
General Hydrology Requirements, ARM 17.24.631(1), (2), (3)(a) and (b) (relevant and appropriate)	X		
Water Quality Performance Standards, ARM 17.24.633 (relevant and appropriate)	X		
Reclamation of Drainage Basins, ARM 17.24.634 (relevant and appropriate)	X		
Diversions, ARM 17.24.635 through 17.24.637 (relevant and appropriate)	X		
Sediment Control Measures, ARM 17.24.638 (relevant and appropriate)	X		
Sedimentation Ponds and other Treatment Facilities, ARM 17.24.639 (relevant and appropriate)		X	
Discharge Structures, ARM 17.24.640 (relevant and appropriate)	X		
Acid- and Toxic-Forming Spoils, ARM 17.24.641 (relevant and appropriate)	X		
Groundwater, ARM 17.24.643 through 17.24.646 (relevant and appropriate)		X	
Soil, ARM 17.24.701 and 17.24.702 (relevant and appropriate)	X		
Substitute Materials, ARM 17.24.703 (relevant and appropriate)	X		
Establishment of Vegetation, ARM 17.24.711 (relevant and appropriate)	X		
Timing of Seeding and Planting, ARM 17.24.713 (relevant and appropriate)	X		
Soil Stabilizing Practices, ARM 17.24.714 (relevant and appropriate)	X		
Method of Revegetation, ARM 17.24.716 (relevant and appropriate)	X		
Planting of Trees and Shrubs, ARM 17.24.717 (relevant and appropriate)	X		
Soil Amendments, ARM 17.24.718 (relevant and appropriate)	X		
Eradication of Rills and Gullies, ARM 17.24.721 (relevant and appropriate)	X		
Monitoring, ARM 17.24.723 (relevant and appropriate)	X		
Revegetation Success Criteria, ARM 17.24.724 (relevant and appropriate)	X		
Vegetation Measurements, ARM 17.24.726 (relevant and appropriate)	X		
Analysis for Toxicity, ARM 17.24.731 (relevant and appropriate)	X		
Protection and Enhancement of Fish and Wildlife, ARM 17.24.751 (relevant and appropriate)	X		

ARARs	Likely ARAR	Possible ARAR	Not Likely ARAR
Air Requirements			
Airborne Particulate Matter, ARM 17.8.308(1), (2) and (3) (applicable)	X		
Visible Air Contaminants, ARM 17.8.304(2) (applicable)	X		
Materials Prohibited from Open Burning, ARM 17.8.604 (applicable)		X	
Fugitive Dust Emissions, ARM 17.24.461 (relevant and appropriate)	X		
Noxious Weeds			
Noxious Weeds, Section 7-22-2101(8)(a), MCA	X		
To Be Considered (TBC) Documents			
Other Laws (Non-Exclusive List)			
Other Federal Laws			
Occupational Safety and Health Regulations, 29 CFR Part 1918 and Part 1926	X		
Other State Laws			
Groundwater Act, Section 85-2-501 et seq., MCA, ARM 17.30.601 et seq., Section 85-2-505, MCA, Section 85-2-516, MCA	X		
Public Water Supply Regulations, ARM 17.38.101(4) (applicable)	X		
Water Rights, Section 85-2-101, MCA; Parts 3 and 4 of Title 85, Chapter 2, MCA; Section 85-2-301, MCA; Section 85-2-302, MCA; Section 85-2-306, MCA; Section 85-2-311, MCA; Section 85-2-402, MCA; and Section 85-2-412, MCA	X		
Controlled Groundwater Areas, Section 85-2-507, MCA, and Section 85-2-506, MCA	X		
Occupational Health Act, Section 50-70-101, et seq., MCA; ARM 17.74.101 and 17.74.102	X		
Montana Safety Act, Sections 50-71-201, 202, and 203, MCA	X		
Employee and Community Hazardous Chemical Information, Sections 50-78-201, 202, and 204, MCA	X		

ARARs listed in Table 9-1 are generic and will be looked at more in depth during the EEE/CA process. In addition, the preamble to the National Oil and Hazardous Substances Pollution Contingency Plan (more commonly known as the National Contingency Plan [NCP] [40 CFR 300]) provides a procedure and a list titled "To be Considered" for evaluating alternative cleanup methods for hazardous wastes. The NCP is located in 55 Federal Register 8765 (March 8, 1990). Those documents will also be considered during the reclamation design and construction.

10.0 Preliminary Identification of Reclamation Alternatives

Reclamation alternatives are evaluated with respect to the overall site objective, as well as specific reclamation goals. The evaluation will be completed through an alternative screening process under the framework of an EEE/CA. The EEE/CA process explores multiple reclamation alternatives and evaluates each alternative in terms of effectiveness, constructability, and cost. Likely alternatives under the EEE/CA and possible future reclamation actions for the BPM could include the following alternatives (or multiple alternatives):

- No action (evaluated as a baseline for other alternatives).
- Institutional controls.
- Stabilize waste in place and revegetate disturbed areas.
- Removal of seepage collection and pumpback system at the Combination Mine AOC.
- Partial removal and stabilization of remaining waste from Combination Mine AOC, Tim Smith Mine AOC, Historic Mine AOC, and Combination Mill AOC, with:
  - Transport of all waste to a nearby repository
  - Transport of some waste to a nearby repository and some waste to an offsite disposal facility
  - Transport of all waste to an offsite disposal facility
- Complete removal of waste from Combination Mine AOC, Tim Smith Mine AOC, Historic Mine AOC, and Combination Mill AOC, with:
  - Transport of all waste to a nearby repository
  - Transport of some waste to a nearby repository and some waste to an offsite disposal facility
  - Transport of all waste to an offsite disposal facility
- Removal of waste from the Combination Mill AOC tailings impoundments. Mill Creek and South Fork Lower Willow Creek have been rerouted and berms have been constructed to separate the creeks from the tailings impoundments. As part of the waste removal, the berms could be removed to allow South Fork Lower Willow Creek to reconnect with the floodplain in this area.

Stabilization, partial removal, and total removal alternatives include backfilling, regrading, amending cover soil as needed, and establishing a vegetative cover.

The total estimated waste volume for BPM is approximately 400,000 cy (Table 7-1). The volume estimates are based on test pit data, drilling data, soil sampling data, stream sediment sampling, and estimates of surface topography existing and prior to site development. Based on the total volume of waste, an onsite repository would be required to have an estimated footprint of approximately 12 to 25 acres. The acreage range for the footprint is due to variability in combinations of the depth of repository excavation, fill height limits, and side slopes. Repository grading/design will focus on developing an economical repository, while also attempting to blend the repository with the surrounding terrain.

If reclamation at BPM does not improve water quality, groundwater and seep discharge at the Combination Mine AOC may require corrective action. Possible remedies include water treatment through natural or mechanical systems.

11.0 Summary and Conclusions

11.1 Chemical Hazards

A total of 283 samples were collected from the BPM including samples submitted for analytical and geotechnical testing. Sample locations were selected to be representative of the multiple waste streams on site and the multiple impacted media, as well as to allow comparison with historical sample results. Sample locations were also identified as part of the preliminary repository investigation, and to characterize background conditions at the BPM.

11.1.1 Combination Mine AOC

Based on review of solid media sample results for the Combination Mine AOC, elevated metals concentrations appear to be limited to the waste rock samples collected from the waste rock pile and one surface soil sample (CMN-SS-13) collected near the lower extent of the South Soils Removal Area. Metals concentrations detected in the samples collected from surface soils on the waste rock pile and in the Combination Mine Soils Removal Areas, as well as soils underlying the waste rock samples were below DEQ RBCG, with the exception of antimony (CMN-SS-13), arsenic (CMN-SS-13), lead (CMN-SS-13), and manganese (CMN-SS-05, CMN-SS-06, and CMN-SS-10). Metals concentrations detected in the samples were approximately one to two orders of magnitude less than metals concentrations detected in the waste rock samples. Reclamation activities performed between 2003 and 2006 by ASARCO (Hydrometrics 2010) appear to have reduced metals concentrations in the Combination Mine Soils Removal Areas, excluding CMN-SS-13. The lack of vegetation in the Combination Mine Soils Removal Areas may be associated with a lack of growth media and from metals in surface water.

Concentrations detected in surface water samples collected from seeps at the Combination Mine AOC exceeded either DEQ RBCG or Circular DEQ-7 standards for at least one metal in each of the water samples. The highest metals concentrations were detected in samples collected from CPS-1 (seep located in the lower portion of the North Soils Removal Area), CPS-7A (seep located on the northern mid-slope border of the South Soils Removal Area), CPS-10B (seep located mid-slope in the North Soils Removal Area), and DTRD (located along the toe of, and directly affected by seepage through the Combination Mine waste rock pile). Cadmium, copper, lead (except CPS-1), manganese, and zinc concentrations detected in samples from these locations were roughly one order of magnitude higher than concentrations detected in samples from other locations at the Combination Mine AOC.

Comparison of surface water results from the 2011 RI with historical data indicates that metals concentrations have declined since removal of impacted soils, grading and capping of the waste rock and impacted soils, and installation of the seepage collection pumpback system. Metals concentrations detected in samples collected from CPS-1 have declined by nearly an order of magnitude. Similarly, metals concentrations, except for iron and lead, have also declined by approximately an order of magnitude in samples collected from CPS-7A. While metals concentrations declined following 2003 to 2006 reclamation at the Combination Mine, the trend

has flattened out since this time, with spikes of increased metals concentrations in 2008 and 2011.

At least one detected metal concentration exceeded Circular DEQ-7 standards in each of the groundwater samples collected at the Combination Mine AOC. The highest metals concentrations were detected in samples from CMMW-3, located in the upper portion of the North Soils Removal Area; CMMW-5, located in the crest of the Combination Mine waste rock pile; and CMMW-7, located at the top of the North Soils Removal Area. The lowest concentrations were detected in CMMW-1, located in the upper portion of the South Soils Removal Area, and CMMW-6, located along the northern crest of the Combination Mine waste rock pile. Historical metals concentrations do not vary notably from the 2011 RI sample results.

11.1.2 Tim Smith Mine AOC

Review of analytical results for solid media samples collected at the Tim Smith Mine AOC indicates metals concentrations exceeded DEQ RBCG in waste rock samples for antimony (two samples), arsenic (three samples), and lead (two samples). The highest metals concentrations were detected in samples collected from the Tim Smith No. 1 Adit waste rock dump. Metals concentrations were notably higher in the two waste rock samples collected from the Tim Smith No. 1 Adit waste rock dump as compared to metals concentrations in the one waste rock sample collected from the Tim Smith No. 2 Adit waste rock dump. Metals concentrations were substantially lower in soil samples collected below the waste rock and in the surface soil samples as compared to the waste rock samples. Metals concentrations detected in the sediment samples were approximately an order of magnitude lower than detected concentrations in waste rock samples, except for manganese, mercury, nickel, and zinc. Of the three sediment samples collected, the highest metals concentrations were detected in the upstream sample (TS-SD-01), which was the closest sediment sample to the Tim Smith No. 1 Adit waste rock dump.

Detected metals concentrations did not vary significantly from upstream to downstream surface water sample locations at the Tim Smith Mine AOC. Copper concentrations increased downstream, while manganese concentrations were higher upstream. In addition, metals concentrations in surface water samples collected at the Tim Smith Mine AOC were significantly (one to two orders of magnitude) lower than concentrations in surface water/seep samples collected at the Combination Mine AOC. Historical metals concentrations appear to be consistent with concentrations detected in 2011 with the exception of iron, which appears to have increased substantially in the samples collected in 2011 (although this may be attributed to the difference in sampling procedures – dissolved versus total recoverable metals).

11.1.3 Historic Mine AOC

Elevated metals concentrations were detected in waste rock samples collected at the Historic Mine AOC. Detected metals concentrations were higher in samples (HM-RS-06 and HM-RS-07) associated with test pits excavated in the downslope edge of the Harper shaft waste rock area. Metals concentrations decreased with depth for samples that were collected at multiple depths. Eleven soil samples were collected at the Historic Mine AOC. The lowest metals concentrations

were detected in the subsurface soil samples at HM-SS-03 and HM-SS-04, and the surface soil samples collected along the northern fringe of the Harrison Shaft waste rock area (HM-SS-11 and HM-SS-12). The highest metals concentrations were detected in samples from HM-SS-13, located north (cross-gradient) of the Harper Shaft waste rock area, and HM-SS-15 and HM-SS-16, both located downgradient from the Lewis Shaft. One sediment sample was collected from Mill Creek; metals concentrations detected in the sediment sample were similar to concentrations detected in the soil samples, with the exception of manganese that was detected at a higher concentration than the waste rock and soil samples. Comparisons to historical metals concentrations could not be made as, prior to this RI, solid media sampling in the Historic Mine AOC was limited to geotechnical/agricultural sampling associated with potential soil borrow areas.

Two surface water samples were collected at the Historic Mine AOC. One sample location coincided with the routine surface water monitoring location, MCSP-1, on Mill Creek. The second sample location, Road Cut, was identified in the field during the sampling event and was located adjacent to the south side of the road from the Lewis Shaft to the Combination Mill. Detected metals concentrations in the sample from MCSP-1 exceeded the DEQ RBCGs for arsenic and zinc, while detected metals concentrations in the sample from Road Cut exceeded the DEQ RBCGs for arsenic. Review of historical sample data for MCSP-1 shows metals concentrations in samples were substantially higher in the 2011 RI samples than in samples collected during previous sampling, with the exception of antimony, cadmium, and silver. This may be partially attributed to total recoverable metals analysis as opposed to dissolved metals analysis, which was used for historical samples.

11.1.4 Combination Mill AOC

Detected metals concentrations were elevated in solid media samples collected during the 2011 RI at the Combination Mill AOC. Average antimony, arsenic, cadmium, copper, iron, lead, and zinc concentrations were higher in the tailings samples than in soil or sediment samples. Average manganese and nickel concentrations were highest in the sediment grid samples, while the average mercury concentration was highest in the subsurface soils samples. Detected metals concentrations from tailings samples did not exhibit trends based on the sample depth. Likewise, detected metals concentrations were not significantly different in the tailings samples from concentrations detected in the underlying soil samples. Metals concentrations in sediment samples decreased moving downstream from the Combination Mill and tailings impoundment, but were dependent on the location of individual samples. Five sediment sample locations were identified in the field to target suspected tailings depositional areas downstream of the tailings impoundment along South Fork Lower Willow Creek. Samples collected at three of these five locations contained the highest metals concentrations of the sediment samples collected during the RI. Metals concentrations detected in sediment samples located upstream of the Combination Mill and tailings impoundment were lower than downstream metals concentrations, with the exception of manganese concentrations.

Historical metals concentrations in solid media samples were similar across the sampling events and elevated across the sampling areas. Metals concentrations appear to vary more with location

of the individual sample, and, at some locations, with depth of the sample than with the date of the sample.

Review of surface water analytical results for samples collected from the Combination Mill AOC indicate total recoverable metals concentrations and metals loading rates increase from upstream to downstream. The largest increase in both metals concentrations and metals loading rates begin at the Combination Mill and continue to increase at sample stations downstream of the Combination Mill on USFS administered lands. Metals concentrations and loading also increase sharply following the sample station located near the amalgamation mill on USFS administered lands. Surface water flowing through the Combination Mill tailings impoundment, historical mining areas, and fluvially deposited tailings in the downstream floodplain are likely responsible for increased metals concentrations and loading rates in South Fork Lower Willow Creek.

11.1.5 Risk Assessments

Human health and ecological risk assessments were performed to identify COCs at the BPM. The human health risk assessment identified COCs present in solid media as antimony, arsenic, and lead, while COCs present in surface water were identified as antimony, arsenic, lead, and mercury. Arsenic and lead are both COCs with the potential to cause both non-carcinogenic and carcinogenic health risks associated with exposure pathways and media of soil, tailings, waste rock, sediments, surface waters (arsenic only), and fish as analyzed in this risk assessment for recreational users.

The ecological risk assessment identified multiple COCs that affect ecosystem health. COCs present in the surface water and sediments in South Fork Lower Willow Creek that pose a significant risk to the health of aquatic life include arsenic, cadmium, copper, lead, mercury, silver, and zinc. COCs affecting terrestrial plant communities include arsenic, cadmium, copper, lead, mercury, and zinc. Concentrations of these contaminants may be a contributing factor to the lack of vegetative growth on impacted areas of the site.

11.2 Physical Hazards

Fourteen buildings or structures were identified onsite that pose multiple potential physical hazards. These hazards include, but are not limited to, falling, tripping, punctures and gouges (from broken glass, nails, scrap metal and lumber), falling debris, biological hazards (rodent infestations and droppings, bird droppings, biting insects), and dust. Fluorescent and HID lights and ballasts were identified in the structures at the Combination Mine AOC and Tim Smith Mine AOC. A total of 152 fluorescent or HID lights, and 247 light ballasts were inventoried.

In addition to the hazards listed above, asbestos was detected in the remnant structure debris at the Harrison Shaft, and analytical results for wood and brick samples collected at the Combination Mill sites indicated these materials have the potential to be classified as hazardous wastes. Arsenic, lead, and mercury were detected in one or more of these samples at levels

higher than 20 times the toxicity characteristic regulatory limit. Further investigation will be necessary before the remains of these structures are removed.

With the exception of the Lewis Shaft and the main Combination Mine Adit, the shafts and adits at the BPM have previously been closed. Access to both the Lewis Shaft and Combination Mine Adit are controlled (locked). Seven of the previously closed adits on the site pose a potential risk of caving. Three of the adits have already caved in and are inaccessible. However, the competency of the closures are unknown, and the manner of some of the cave-in caused closures create falling, tripping, and/or entrapment hazards.

11.3 Conclusions

Elevated metals concentrations, above DEQ RBCG and Circular DEQ-7 standards, were identified in solid media and water samples at the BPM.

Past reclamation efforts at the BPM have included excavation of impacted soils from the Combination Mine Soils Removal Areas, placement of this material with the Combination Mine waste rock pile, and regrading and capping of the waste rock pile. Tailings associated with the Combination Mill were consolidated in the Combination Mill tailings impoundments and separated from South Fork Lower Willow Creek with an earthen berm. Based on comparison of 2011 RI data with historical data, these reclamation efforts reduced the extent and degree of metals impacts. However, several areas of impacted wastes were not contained and shallow groundwater/subsurface runoff appears to contact the wastes in both the Combination Mine waste rock pile and the Combination Mill tailings impoundments. In the case of the Combination Mine waste rock pile, a portion of this shallow groundwater is expressed in downslope seeps. Seep sampling and groundwater well sampling should be performed in the spring for comparison purposes to previous sample results. Transducers installed in groundwater wells at the Combination Mine should be downloaded quarterly, and the data loggers installed on the pipes for the Combination Mine pumpback system should be downloaded quarterly to track water elevations and discharge pumped back into the mine workings.

Tailings in the Combination Mill tailings impoundment are saturated and the shallow groundwater is hydrologically connected to South Fork Lower Willow Creek. The Combination Mill tailings impoundments are also susceptible to flooding from South Fork Lower Willow Creek. Additional surface water and sediment sampling should be collected from South Fork Lower Willow Creek to determine contamination extents downstream of Black Pine Mine and for comparison to historical data and background data.

In addition to the wastes in the Combination Mill tailings impoundments and the Combination Mine waste rock pile, impacted wastes were identified in waste rock dumps at the Tim Smith No. 1 and No. 2 adits, and in waste rock areas associated with the Lewis Shaft, Harrison Shaft, and Harper Shafts. Impacted wastes were also identified in pockets adjacent to and downstream of the Combination Mill tailings impoundment in South Fork Lower Willow Creek. The impacted wastes, as well as metals-laden surface water and seeps impacted through contact with

these wastes create toxic conditions for site users, terrestrial wildlife, terrestrial plants, and aquatic communities.

Due to the levels of toxic substances at the BPM, reclamation to reduce human health and ecological risks is recommended. Reclamation should focus on removing antimony, arsenic, and lead from human exposure pathways associated with soil, tailings, waste rock, and sediments, as well as removing antimony, arsenic, lead, and mercury from exposure pathways associated with surface waters. Removing metals from exposure pathways associated with surface waters will largely be associated with removing impacted waste rock, tailings, sediments, and soils. Impacted wastes, including those contained in the Combination Mine waste rock pile and in the Combination Mill tailings impoundments, impacted soils near test pit CMN-SS-13 in the South Soils Removal Area, impacted wastes in the Tim Smith Mine AOC, and impacted wastes in the Historic Mine AOC, should be separated from surface water and shallow groundwater. These wastes should be covered or capped in a manner to eliminate exposure to terrestrial plants and wildlife.

An alternative for consolidating the waste and separating it from receptors is placement in an onsite repository. Four potential repository sites were evaluated during the RI. Based on this evaluation, the potential Repository 2 area appears to be best suited for containing BPM wastes. Since the mine waste may be placed on bedrock, additional design considerations are appropriate for slope stability considerations. Additional investigations and continued monitoring is also appropriate to better understand shallow groundwater in the area of the potential repository. Transducers installed in wells downgradient of Repository 2 should be downloaded quarterly and groundwater, if present, should be collected from wells and analyzed for dissolved metals.

Wastes were also identified in, or associated with building materials for buildings/structures at the BPM.

- Soil stockpiles identified in the Central Processing building at the Combination Mine AOC should be removed and disposed of with other impacted wastes.

- If buildings are demolished in the future, the ballasts and light tubes identified in buildings at the Combination Mine AOC and Tim Smith Mine AOC should be collected and sent to a certified recycling/disposal facility.

- A disposal or recycling location for general building refuse should be identified if structures are demolished in the future.

- Results of analytical analyses of brick and wood debris samples at the Combination Mill and “Old” Mill sites indicated these materials may be classified as hazardous materials. TCLP analysis should be performed on the wood and brick materials at the Combination Mill sites to determine whether the material will need to be handled as hazardous waste (disposed in a RCRA Subtitle C hazardous waste landfill).

- Asbestos was detected (60% Chrysotile) in the grout sample collected from the collapsed Harrison Shaft rubble. This material will require special handling and disposal in a proper facility.

An archeological assessment should be performed to determine how the structures at the BPM should be managed during site reclamation. Other physical hazards associated with closed shafts and adits should be further evaluated. The competency of the closed adits and shafts, as well as means, if appropriate, for sealing them should be further explored.

Reclamation alternatives should be further identified and examined as part of an EEE/CA process.

12.0 References

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TABLES

TABLE 2-1. RECLAMATION INVESTIGATION SAMPLING SUMMARY
BLACK PINE MINE

Sample Location	Matrix	Analysis	Sample Identification Number	Sample Depth (ft)	Rationale
Combination Mine AOC					
Test Pit #1 – north side of waste rock pile, midslope of waste rock pile	Soil	Total recoverable metals ABA Moisture content	CMN-SS-04	0–1	Characterization of waste materials
	Waste Rock	Total recoverable metals ABA Moisture content	CMN-RS-04	2-4	Characterization of waste materials
	Waste Rock	Total recoverable metals ABA Moisture content	CMN-RS-04	5-7	Characterization of waste materials
	Soil	Total recoverable metals Moisture content	CMN-SS-04	8-10	Characterization of underlying material
Test Pit #2 – south side of waste rock pile, midslope of waste rock pile	Soil	Total recoverable metals ABA Moisture content	CMN-SS-05	0–1	Characterization of waste materials
	Waste Rock	Total recoverable metals ABA Moisture content	CMN-RS-05	5-7	Characterization of waste materials
	Soil	Total recoverable metals Moisture content	CMN-SS-05	8-10	Characterization of underlying material
Test Pit #3 – south side of waste rock pile, toe of waste rock pile	Soil	Total recoverable metals ABA Moisture content	CMN-SS-06	0-1	Characterization of waste materials
	Waste Rock	Total recoverable metals ABA Moisture content	CMN-RS-06	2-4	Characterization of waste materials
	Soil	Total recoverable metals Moisture content	CMN-SS-06	6-8	Characterization of underlying material
North Removal Area (NRA) test pit #1 –east of the seep collection pond	Soil	Total recoverable metals ABA Moisture content	CMN-SS-07	0-1	Characterization of waste materials Support risk assessment Compare conditions across NRA
	Soil	Total recoverable metals Agriculture ABA Moisture content	CMN-SS-07	6-7	Characterization of underlying materials Depth of waste Ability to support vegetation if upper material removed

TABLE 2-1. RECLAMATION INVESTIGATION SAMPLING SUMMARY
BLACK PINE MINE

Sample Location	Matrix	Analysis	Sample Identification Number	Sample Depth (ft)	Rationale
NRA test pit #2 –east of NRA test pit #1	Soil	Total recoverable metals ABA Moisture content	CMN-SS-08	0-1	Characterization of waste materials Support risk assessment Compare conditions across NRA
	Soil	Total recoverable metals Agriculture ABA Moisture content	CMN-SS-08	3-5	Characterization of underlying materials Depth of waste Ability to support vegetation if upper material removed
NRA test pit #3 –east of NRA test pit #2	Soil	Total recoverable metals ABA Moisture content	CMN-SS-09	0–1	Characterization of waste materials Support risk assessment Compare conditions across NRA
	Soil	Particle size analysis Standard Proctor Atterberg limits Specific gravity of particles Moisture content	CMN-SS-09	0–1	Geotechnical properties
	Soil	Total recoverable metals Agriculture ABA Moisture content	CMN-SS-09	4-6	Characterization of underlying materials Depth of waste Ability to support vegetation if upper material removed
NRA test pit #4 –east of NRA test pit #3 (on USFS property)	Soil	Total recoverable metals ABA Moisture content	CMN-SS-10	0–1	Characterization of waste materials Support risk assessment Compare conditions across NRA
	Soil	Total recoverable metals Moisture content	CMN-SS-10	4-5	Characterization of underlying materials Depth of waste
South removal area (SRA) test pit #5 –east of road	Soil	Total recoverable metals ABA Moisture content	CMN-SS-11	0–1	Characterization of waste materials Support risk assessment Compare conditions across SRA
	Soil	Particle size analysis Standard Proctor Atterberg limits Specific gravity of particles Moisture content	CMN-SS-11	0–1	Geotechnical properties
	Soil	Total recoverable metals Agriculture ABA Moisture content	CMN-SS-11	4-5	Characterization of underlying materials Depth of waste Ability to support vegetation if upper material removed

TABLE 2-1. RECLAMATION INVESTIGATION SAMPLING SUMMARY
BLACK PINE MINE

Sample Location	Matrix	Analysis	Sample Identification Number	Sample Depth (ft)	Rationale
SRA test pit #6 –east of SRA test pit #5	Soil	Total recoverable metals ABA Moisture content	CMN-SS-12	0–1	Characterization of waste materials Support risk assessment Compare conditions across SRA
	Soil	Total recoverable metals Agriculture ABA Moisture content	CMN-SS-12	4-5	Characterization of underlying materials Depth of waste Ability to support vegetation if upper material removed
SRA test pit #7 –east of SRA test pit #6	Soil	Total recoverable metals ABA Moisture content	CMN-SS-13	0–1	Characterization of waste materials Support risk assessment Compare conditions across SRA
	Soil	Total recoverable metals Agriculture ABA Moisture content	CMN-SS-13	4-5	Characterization of underlying materials Depth of waste Ability to support vegetation if upper material removed
Combination soils removal area test pit #8 – east of SRA test pit #7 and NRA test pit #4 (on USFS property)	Soil	Total recoverable metals ABA Moisture content	CMN-SS-14	0–1	Characterization of waste materials Support risk assessment Compare conditions across SRA
	Soil	Total recoverable metals Moisture content	CMN-SS-14	4-5	Characterization of underlying materials Depth of waste
Soil sample in drainage ditch just north of Trust Property Boundary (on USFS property)	Soil	Total recoverable metals Moisture content	CMN-SS-15	0-.5	Characterization of waste materials
Soils sample east of ditch culvert (on USFS property)	Soil	Total recoverable metals Moisture content	CMN-SS-16	0-.5	Characterization of waste materials
CPS-1- Combination NRA down gradient from	Surface water (seep)	Total recoverable metals Field parameters Laboratory parameters	CPS-1	–	Support risk assessment Compare conditions across site
CPS-2 (on USFS property)	Surface water (seep)	Total recoverable metals Field parameters Laboratory parameters	CPS-2	–	Support risk assessment Compare conditions across site
CPS-7A	Surface water (seep)	Total recoverable metals Field parameters Laboratory parameters	CPS-7A	–	Support risk assessment Compare conditions across site

TABLE 2-1. RECLAMATION INVESTIGATION SAMPLING SUMMARY
BLACK PINE MINE

Sample Location	Matrix	Analysis	Sample Identification Number	Sample Depth (ft)	Rationale
CPS-8	Surface water (seep)	Total recoverable metals Field parameters Laboratory parameters Hardness	CPS-8	–	Support risk assessment Compare conditions across site
CPSW-1 (on USFS property)	Surface water (seep)	Total recoverable metals Field parameters Laboratory parameters	CPSW-1	–	Downstream recovery conditions Support risk assessment Compare conditions across site
CPSW-2 (on USFS property)	Surface water (seep)	Total recoverable metals Field parameters Laboratory parameters	CPSW-2	–	Downstream recovery conditions Support risk assessment Compare conditions across site
CPS-10 (location was formerly CPS-10B)	Surface water (seep)	Total recoverable metals Field parameters Laboratory parameters	CPS-10B	–	Support risk assessment Compare conditions across site
Dump Toe Runoff Ditch - Toe of waste rock pile	Surface Water (seep)	Total recoverable metals Field parameters Laboratory parameters	DTRD	-	Support risk assessment Compare conditions across site
North Runoff (mid-slope runoff from Combination Soils)	Surface water (seep)	Total recoverable metals Field parameters Laboratory parameters	North Runoff	–	Support risk assessment Compare conditions across site
North Area Spring	Surface Water (seep)	Total recoverable metals Field parameters Laboratory parameters	North Area Spring (N)	-	Support risk assessment Compare conditions across site
CMMW-1	Groundwater	Dissolved metals Field parameters Laboratory parameters	CMMW-1	–	Support risk assessment Compare groundwater and seep conditions
CMMW-2	Groundwater	Dissolved metals Field parameters Laboratory parameters	CMMW-2	–	Support risk assessment Compare groundwater and seep conditions
CMMW-3	Groundwater	Dissolved metals Field parameters Laboratory parameters	CMMW-3	–	Support risk assessment Compare groundwater and seep conditions
CMMW-4	Groundwater	Dissolved metals Field parameters Laboratory parameters	CMMW-4	–	Support risk assessment Compare groundwater and seep conditions
CMMW-5	Groundwater	Dissolved metals Field parameters Laboratory parameters	CMMW-5	–	Support risk assessment Compare groundwater and seep conditions
CMMW-6	Groundwater	Dissolved metals Field parameters Laboratory parameters	CMMW-6	–	Support risk assessment Compare groundwater and seep conditions

TABLE 2-1. RECLAMATION INVESTIGATION SAMPLING SUMMARY
BLACK PINE MINE

Sample Location	Matrix	Analysis	Sample Identification Number	Sample Depth (ft)	Rationale
CMMW-7	Groundwater	Dissolved metals Field parameters Laboratory parameters	CMMW-7	–	Support risk assessment Compare groundwater and seep conditions
CMMW-8	Groundwater	Dissolved metals Field parameters Laboratory parameters	CMMW-8	–	Support risk assessment Compare groundwater and seep conditions
CMMW-9	Groundwater	Dissolved metals Field parameters Laboratory parameters	CMMW-9	–	Support risk assessment Compare groundwater and seep conditions
Infrastructure	Soil	Total recoverable metals Moisture content	CMN-SS-17, CMN-SS-18, and CMN-SS-19		Determine existing conditions
	Building material	Asbestos	CMN-ASB-04 through CMN-ASB-33	–	Characterize materials stored in the plant buildings and historical structures
Tim Smith Mine AOC					
#1 Adit waste rock dump, Test pit #1 – top of waste rock pile	Waste rock	Total recoverable metals ABA Moisture content	TS-RS-01	4-6	Characterization of waste materials Compaction stability and settlement potential
	Waste rock	Standard Proctor Particle size analysis Standard Proctor Atterberg limits Specific gravity of particles Moisture content	TS-RS-01	4-6	Compaction stability and settlement potential Geotechnical properties
	Soil	Total recoverable metals Moisture content	TS-SS-01	6-8	Characterization of underlying material
#1 Adit waste rock dump, Test pit #2 – top of waste rock pile	Soil	Total recoverable metals Moisture content	TS-SS-02	2-4	Characterization of underlying material
#1 Adit waste rock dump, Test pit #3 – toe of waste rock pile	Waste rock	Total recoverable metals ABA Moisture content	TS-RS-03	2-4	Characterization of waste materials
	Soil	Total recoverable metals Moisture content	TS-SS-03	3-5	Characterization of underlying material
#2 Adit waste rock dump, Test pit #2 – top of waste	Soil	Total recoverable metals Moisture content	TS-SS-07	1-3	Characterization of material

TABLE 2-1. RECLAMATION INVESTIGATION SAMPLING SUMMARY
BLACK PINE MINE

Sample Location	Matrix	Analysis	Sample Identification Number	Sample Depth (ft)	Rationale
rock pile	Waste rock	Total recoverable metals ABA Moisture content	TS-RS-07	4-6	Characterization of waste materials
#2 Adit waste rock dump, Test pit #3 – side slope of waste rock pile	Soil	Total recoverable metals Moisture content	TS-SS-08	1-3	Characterization of material
Drainage #1 (co-located with TSP-8)	Sediment	Total recoverable metals Moisture content	TS-SD-01	0–.5	Determine recovery conditions Support risk assessment Provide information for the EEE/CA
Drainage #2 (co-located with TSP-3)	Sediment	Total recoverable metals Moisture content	TS-SD-02	0–.5	Determine recovery conditions Support risk assessment Provide information for the EEE/CA
Drainage #3 (co-located with TSP-6)	Sediment	Total recoverable metals Moisture content	TS-SD-03	0–.5	Determine recovery conditions Support risk assessment Provide information for the EEE/CA
TSP-3	Surface water	Total recoverable metals Field parameters Laboratory parameters	TSP-3	–	Support risk assessment Compare conditions across site
TSP-6	Surface water	Total recoverable metals Field parameters Laboratory parameters	TSP-6	–	Support risk assessment Compare conditions across site Synoptic sampling location
TSP-8	Surface water	Total recoverable metals Field parameters Laboratory parameters Hardness	TSP-8	–	Support risk assessment Compare conditions across site
TSP-9	Surface water	Total recoverable metals Field parameters Laboratory parameters	TSP-9	–	Support risk assessment Compare conditions across site
TSP-10	Surface water	Total recoverable metals Field parameters Laboratory parameters	TSP-10	–	Support risk assessment Compare conditions across site
Infrastructure	Material	Asbestos	HM-ASB—43, HM-ASB-44, and HM-ASB-45	–	Characterize materials stored in the plant buildings and historical structures

TABLE 2-1. RECLAMATION INVESTIGATION SAMPLING SUMMARY
BLACK PINE MINE

Sample Location	Matrix	Analysis	Sample Identification Number	Sample Depth (ft)	Rationale
Historic Mine AOC					
Harrison Shaft waste rock area – test pit #1	Waste rock	Particle size analysis Standard Proctor Atterberg limits Specific gravity of particles Moisture content	HM-RS-01	5	Compaction stability and settlement potential Geotechnical properties
	Waste rock	Total recoverable metals ABA Moisture content	HM-RS-01	8-10	Characterization of waste materials
	Waste rock	Total recoverable metals Moisture content	HM-RS-01	16-17	Characterization of waste materials
Harrison Shaft waste rock area – test pit #2	Waste rock	Total recoverable metals ABA Moisture content	HM-RS-02	1-3	Characterization of waste materials
	Waste rock	Total recoverable metals Moisture content	HM-RS-02	3-5	Characterization of waste materials
Harrison Shaft waste rock area – test pit #3	Waste rock	Total recoverable metals ABA Moisture content	HM-RS-03	1-3	Characterization of waste materials
	Soil	Total recoverable metals Moisture content	HM-SS-03	3-5	Characterization of underlying material
Harrison Shaft waste rock area – test pit #4	Waste rock	Total recoverable metals ABA Moisture content	HM-RS-04	7-9	Characterization of waste materials
	Soil	Total recoverable metals Moisture content	HM-SS-04	10-12	Characterization of underlying material
Harper Shaft waste rock area – test pit #1	Waste rock	Total recoverable metals ABA Moisture content	HM-RS-05	2-4	Characterization of waste materials
	Waste rock	Total recoverable metals Moisture content	HM-RS-05	5-7	Characterization of waste materials
Harper Shaft waste rock area – test pit #2	Waste rock	Total recoverable metals ABA Moisture content	HM-RS-06	1-3	Characterization of waste materials

TABLE 2-1. RECLAMATION INVESTIGATION SAMPLING SUMMARY
BLACK PINE MINE

Sample Location	Matrix	Analysis	Sample Identification Number	Sample Depth (ft)	Rationale
	Waste rock	Standard Proctor Particle size analysis Atterberg limits Specific gravity of particles Moisture content	HM-RS-06	1-3	Compaction stability and settlement potential Geotechnical properties
	Waste rock	Total recoverable metals Moisture content	HM-RS-06	8-10	Characterization of waste materials
Harper Shaft waste rock area – test pit #3	Waste rock	Total recoverable metals ABA Moisture content	HM-RS-07	1-3	Characterization of waste materials
	Soil	Total recoverable metals Moisture content	HM-SS-07	3-5	Characterization of underlying material
Lewis Shaft waste rock pile – test pit #1	Waste rock	Total recoverable metals ABA Moisture content	HM-RS-08	2-4	Characterization of waste materials
Downgradient of Harrison Shaft #1	Soil	Total recoverable metals ABA Moisture content	HM-SS-09	0-.5	Support risk assessment Compare conditions across site
Downgradient of Harrison Shaft #2	Soil	Total recoverable metals ABA Moisture content	HM-SS-10	0-.5	Support risk assessment Compare conditions across site
Downgradient of Harrison Shaft #3	Soil	Total recoverable metals ABA Moisture content	HM-SS-11	0-.5	Support risk assessment Compare conditions across site
Downgradient of Harrison Shaft #4	Soil	Total recoverable metals ABA Moisture content	HM-SS-12	0-.5	Support risk assessment Compare conditions across site
Downgradient of Harper Shaft #1	Soil	Total recoverable metals ABA Moisture content	HM-SS-13	0-.5	Support risk assessment Compare conditions across site
Downgradient of Harper Shaft #2	Soil	Total recoverable metals ABA Moisture content	HM-SS-14	0-.5	Support risk assessment Compare conditions across site
Lewis Shaft “dead zone” #1	Soil	Total recoverable metals ABA Moisture content	HM-SS-15	0-.5	Support risk assessment Compare conditions across site

TABLE 2-1. RECLAMATION INVESTIGATION SAMPLING SUMMARY
BLACK PINE MINE

Sample Location	Matrix	Analysis	Sample Identification Number	Sample Depth (ft)	Rationale
Lewis Shaft "dead zone" #2	Soil	Total recoverable metals ABA Moisture content	HM-SS-16	0-.5	Support risk assessment Compare conditions across site
Mill Creek location MCSP-1	Sediment	Total recoverable metals Moisture content	HM-SD-01	0-.5	Comparison to downstream conditions
MCSP-1 – historic sample location in Mill Creek	Surface water	Total recoverable metals Field parameters Laboratory parameters	MCSP-1	–	Support risk assessment Compare conditions across site
Road Cut	Surface water (seep)	Total recoverable metals Field parameters Laboratory parameters	Road Cut	–	Support risk assessment Compare conditions across site
Infrastructure	Material	Asbestos	HM-ASB-01 through HM-ASB-03, and HM-ASB-34, HM-ASB-35, and HM-ASB-40 through HM-ASB-42	–	Characterize materials stored in the plant buildings and historical structures
Combination Mill AOC					
Tailings impoundment – test pit #1	Tailings	Total recoverable metals Moisture content	CML-TS-01	0–1	Characterization of waste materials
	Tailings	Total recoverable metals ABA Moisture content	CML-TS-01	2-4	Characterization of waste materials
	Soil	Total recoverable metals Moisture content	CML-SS-01	6-7	Characterization of underlying material
Tailings impoundment – test pit #2	Tailings	Total recoverable metals Moisture content	CML-TS-02	0–1	Characterization of waste materials
	Tailings	Total recoverable metals ABA Moisture content	CML-TS-02	2-4	Characterization of waste materials
	Soil	Total recoverable metals Moisture content	CML-SS-02	6-7	Characterization of underlying material
Tailings impoundment – test pit #3	Tailings	Total recoverable metals Moisture content	CML-TS-03	0–1	Characterization of waste materials

TABLE 2-1. RECLAMATION INVESTIGATION SAMPLING SUMMARY
BLACK PINE MINE

Sample Location	Matrix	Analysis	Sample Identification Number	Sample Depth (ft)	Rationale
	Tailings	Total recoverable metals ABA Moisture content	CML-TS-03	2-4	Characterization of waste materials
	Soil	Total recoverable metals Moisture content	CML-SS-03	6-7	Characterization of underlying material
Tailings impoundment – test pit #4	Tailings	Total recoverable metals Moisture content	CML-TS-04	0–1	Characterization of waste materials
	Tailings	Total recoverable metals ABA Moisture content	CML-TS-04	2-4	Characterization of waste materials
	Soil	Total recoverable metals Moisture content	CML-SS-04	6-8	Characterization of underlying material
Tailings impoundment – test pit #5	Tailings	Total recoverable metals Moisture content	CML-TS-05	0–1	Characterization of waste materials
	Tailings	Total recoverable metals ABA Moisture content	CML-TS-05	2-4	Characterization of waste materials
	Soil	Total recoverable metals Moisture content	CML-SS-05	4-6	Characterization of underlying material
Tailings impoundment – test pit #6	Tailings	Total recoverable metals Moisture content	CML-TS-06	0–1	Characterization of waste materials
	Tailings	Total recoverable metals ABA Moisture content	CML-TS-06	2-4	Characterization of waste materials
	Soil	Total recoverable metals Moisture content	CML-SS-06	5-7	Characterization of underlying material
Tailings impoundment – test pit #7	Tailings	Total recoverable metals Moisture content	CML-TS-07	0–1	Characterization of waste materials
	Tailings	Total recoverable metals ABA Moisture content	CML-TS-07	2-4	Characterization of waste materials
	Soil	Total recoverable metals Moisture content	CML-SS-07	5-7	Characterization of underlying material
Tailings impoundment – test pit #8	Tailings	Total recoverable metals Moisture content	CML-TS-08	0–1	Characterization of waste materials

TABLE 2-1. RECLAMATION INVESTIGATION SAMPLING SUMMARY
BLACK PINE MINE

Sample Location	Matrix	Analysis	Sample Identification Number	Sample Depth (ft)	Rationale
	Tailings	Total recoverable metals ABA Moisture content	CML-TS-08	5-7	Characterization of waste materials
	Soil	Total recoverable metals Moisture content	CML-SS-08	7-9	Characterization of underlying material
Test pit – footprint of the former Combination Mill	Tailings	Total recoverable metals Moisture content	CML-TS-09	0–1	Characterization of waste materials
	Tailings	Total recoverable metals Moisture content	CML-TS-09	2-4	Characterization of waste materials
	Tailings	Total recoverable metals Moisture content	CML-TS-09	4-6	Characterization of waste materials
	Tailings	Total recoverable metals Moisture content	CML-TS-09	6-8	Characterization of waste materials
Test pit – adjacent to the "Old Mill"	Tailings	Total recoverable metals ABA Moisture content	CML-TS-10	0–1	Characterization of waste materials
	Tailings	Total recoverable metals Moisture content	CML-TS-10	2-4	Characterization of waste materials
	Soil	Total recoverable metals Moisture content	CML-SS-10	6-7	Characterization of underlying material
South Fork Lower Willow Creek - #1	Sediment	Total recoverable metals Moisture content	CML-SD-01	0-.5	Determine recovery conditions Determine extent of downstream contamination
South Fork Lower Willow Creek - #2	Sediment	Total recoverable metals Moisture content	CML-SD-02	0-.5	Determine recovery conditions Determine extent of downstream contamination
South Fork Lower Willow Creek - #3	Sediment	Total recoverable metals Moisture content	CML-SD-03	0-.5	Determine recovery conditions Determine extent of contamination
South Fork Lower Willow Creek - #4	Sediment	Total recoverable metals Moisture content	CML-SD-04	0-.5	Determine recovery conditions Determine extent of contamination
South Fork Lower Willow Creek - #5	Sediment	Total recoverable metals Moisture content	CML-SD-05	0-.5	Determine recovery conditions Determine extent of contamination
South sediment pond adjacent to Mill Creek	Sediment	Total recoverable metals Moisture content	CML-SD-06	0-.5	Determine extent of contamination
North sediment pond near Trust boundary	Sediment	Total recoverable metals Moisture content	CML-SD-07	0-.5	Determine extent of contamination
South Fork Lower Willow Creek - #6	Sediment	Total recoverable metals Moisture content	CML-SD-08	0-.5	Determine recovery conditions Determine extent of downstream contamination

TABLE 2-1. RECLAMATION INVESTIGATION SAMPLING SUMMARY
BLACK PINE MINE

Sample Location	Matrix	Analysis	Sample Identification Number	Sample Depth (ft)	Rationale
South Fork Lower Willow Creek - #7	Sediment	Total recoverable metals Moisture content	CML-SD-09	0-.5	Determine recovery conditions Determine extent of downstream contamination
South Fork Lower Willow Creek - #8	Sediment	Total recoverable metals Moisture content	CML-SD-10	0-.5	Determine recovery conditions Determine extent of downstream contamination
South Fork Lower Willow Creek - #9	Sediment	Total recoverable metals Moisture content	CML-SD-11	0-.5	Determine recovery conditions Determine extent of downstream contamination
South Fork Lower Willow Creek floodplain – determined in field #1	Sediment	Total recoverable metals Moisture content	CML-SD-13	0-.5	Determine recovery conditions Determine extent of downstream contamination
South Fork Lower Willow Creek floodplain – determined in field #2	Sediment	Total recoverable metals Moisture content	CML-SD-14	0-.5	Determine extent of contamination
South Fork Lower Willow Creek floodplain – determined in field #3	Sediment	Total recoverable metals Moisture content	CML-SD-15	0-.5	Determine recovery conditions Determine extent of downstream contamination
South Fork Lower Willow Creek floodplain – determined in field #4	Sediment	Total recoverable metals Moisture content	CML-SD-16	0-.5	Determine recovery conditions Determine extent of downstream contamination
South Fork Lower Willow Creek floodplain – determined in field #5	Sediment	Total recoverable metals Moisture content	CML-SD-17	0-.5	Determine recovery conditions Determine extent of downstream contamination
South Fork Lower Willow Creek floodplain – grid sampling (29 samples)	Sediment/Soil	Total recoverable metals Moisture content	CML-SD-18 through CML-SD-46	0-.5	Determine recovery conditions Determine extent of contamination
South Fork Lower Willow Creek floodplain – grid sampling (7 samples)	Sediment/Soil	Total recoverable metals Moisture content	CML-SD-19, CML-SD-20, CML-SD-23, CML-SD-24, CML-SD-31, CML-SD-33, CML-SD-42	2-3, 2-3, 2-3, 1-2, 2-3, 1-2, 2-3	Determine recovery conditions Determine extent of contamination Samples at depth collected when signs of tailings visible
Co-located with sediment (SFLWILLOWC03/CML-SD-01)	Surface water	Total recoverable metals Field parameters Laboratory parameters	CML-SW-01	–	Support risk assessment Compare conditions across site Synoptic sampling location
Co-located with sediment (SFLWILLOWC04/CML-SD-02)	Surface water	Total recoverable metals Field parameters Laboratory parameters	CML-SW-02	–	Support risk assessment Compare conditions across site Synoptic sampling location

TABLE 2-1. RECLAMATION INVESTIGATION SAMPLING SUMMARY
BLACK PINE MINE

Sample Location	Matrix	Analysis	Sample Identification Number	Sample Depth (ft)	Rationale
Co-located with sediment (SFLWILLOWC04.5/CML-SD-03)	Surface water	Total recoverable metals Field parameters Laboratory parameters	CML-SW-03	–	Support risk assessment Compare conditions across site Synoptic sampling location
Co-located with sediment (SFLWILLOWC05/CML-SD-04)	Surface water	Total recoverable metals Field parameters Laboratory parameters	CML-SW-04	–	Support risk assessment Compare conditions across site Synoptic sampling location
Upstream of confluence with SFLWILLOW and Tim Smith Drainage (Co-located with CML-SD-05)	Surface Water	Total recoverable metals Field parameters Laboratory parameters Hardness	CML-SW-05	-	Support risk assessment Compare conditions across site Synoptic sampling location
South sediment pond adjacent to Mill Creek (Co-located with CML-SD-06)	Surface water	Total recoverable metals Field parameters Laboratory parameters	CML-SW-06	–	Support risk assessment Compare conditions across site
North sediment pond near Trust boundary (Co-located with CML-SD-07)	Surface water	Total recoverable metals Field parameters Laboratory parameters	CML-SW-07	–	Support risk assessment Compare conditions across site
Co-located with sediment (CML-SD-08)	Surface water	Total recoverable metals Field parameters Laboratory parameters	CML-SW-08	–	Support risk assessment Compare conditions across site Synoptic sampling location
Co-located with sediment (CML-SD-09)	Surface water	Total recoverable metals Field parameters Laboratory parameters	CML-SW-09	–	Support risk assessment Compare conditions across site Synoptic sampling location
Co-located with sediment (CML-SD-10)	Surface water	Total recoverable metals Field parameters Laboratory parameters	CML-SW-10	–	Support risk assessment Compare conditions across site Synoptic sampling location
Co-located with sediment (CML-SD-11)	Surface water	Total recoverable metals Field parameters Laboratory parameters	CML-SW-11	–	Support risk assessment Compare conditions across site Synoptic sampling location
Downstream of South Fork Lower Willow Creek and Tim Smith Drainage confluence	Surface water	Total recoverable metals Field parameters Laboratory parameters	CML-SW-13	–	Synoptic sampling location
Upstream of Mill Creek and South Fork Lower Willow Creek confluence	Surface water	Total recoverable metals Field parameters Laboratory parameters	CML-SW-14	–	Synoptic sampling location

TABLE 2-1. RECLAMATION INVESTIGATION SAMPLING SUMMARY
BLACK PINE MINE

Sample Location	Matrix	Analysis	Sample Identification Number	Sample Depth (ft)	Rationale
Downstream of Mill Creek and South Fork Lower Willow Creek confluence	Surface water	Total recoverable metals Field parameters Laboratory parameters Hardness	CML-SW-15	–	Synoptic sampling location
Downstream of CML-SW-02 approximately 550 feet	Surface water	Total recoverable metals Field parameters Laboratory parameters	CML-SW-16	–	Synoptic sampling location
Unnamed drainage from the west downstream of CML-SW-16	Surface water	Total recoverable metals Field parameters Laboratory parameters	CML-SW-17	–	Synoptic sampling location
Unnamed drainage from the west downstream of CML-SW-09	Surface water	Total recoverable metals Field parameters Laboratory parameters	CML-SW-18	–	Synoptic sampling location
South Fork Lower Willow Creek Sample approximately midway between samples CML-SW-13 and CML-SW-04	Surface water	Total recoverable metals Field parameters Laboratory parameters	CML-SW-19	–	Synoptic sampling location
Infrastructure	Building Material – Roasting Bricks	RCRA metals	CML-RCRA-01 through CML-RCRA-04	–	Characterize materials in the area
		Asbestos	CML-ASB-36 through CML-ASB-39	–	Characterize materials in the area
Repository (RY)					
Test pit #1 – Repository 1	Soil	Total recoverable metals Agricultural ABA Moisture content	RY-SS-01	0-1	Background Ability to support vegetation
	Soil	Particle size analysis Standard Proctor Atterberg limits Specific gravity of particles Moisture content	RY-SS-01	0-1.3	Compaction stability and settlement potential Geotechnical properties

TABLE 2-1. RECLAMATION INVESTIGATION SAMPLING SUMMARY
BLACK PINE MINE

Sample Location	Matrix	Analysis	Sample Identification Number	Sample Depth (ft)	Rationale
	Soil	Particle size analysis Standard Proctor Atterberg limits Specific gravity of particles Moisture content	RY-SS-01	1.3-2.7	Compaction stability and settlement potential Geotechnical properties
Test pit #2 – Repository 1	Soil	Total recoverable metals Agricultural ABA Moisture content	RY-SS-02	0–1	Background Ability to support vegetation
	Soil	Particle size analysis Standard Proctor Atterberg limits Specific gravity of particles Moisture content	RY-SS-02	0-.5	Compaction stability and settlement potential Geotechnical properties
	Soil	Particle size analysis Standard Proctor Atterberg limits Specific gravity of particles Moisture content	RY-SS-02	.5-2.7	Compaction stability and settlement potential Geotechnical properties
	Soil	Total recoverable metals Agricultural ABA Moisture content	RY-SS-02	2-4	Background Ability to support vegetation
Test pit #3 – Repository 2	Soil	Total recoverable metals Agricultural ABA Moisture content	RY-SS-03	0-1	Background Ability to support vegetation
	Soil	Particle size analysis Standard Proctor Atterberg limits Specific gravity of particles Moisture content	RY-SS-03	0-1.5	Compaction stability and settlement potential Geotechnical properties
	Soil	Total recoverable metals Agricultural ABA Moisture content	RY-SS-03	12-14	Background Ability to support vegetation

TABLE 2-1. RECLAMATION INVESTIGATION SAMPLING SUMMARY
BLACK PINE MINE

Sample Location	Matrix	Analysis	Sample Identification Number	Sample Depth (ft)	Rationale
	Soil	Particle size analysis Standard Proctor Atterberg limits Specific gravity of particles Moisture content	RY-SS-03	13	Compaction stability and settlement potential Geotechnical properties
Test pit #4 – Repository 2	Soil	Total recoverable metals Agricultural ABA Moisture content	RY-SS-04	0–1	Background Ability to support vegetation
	Soil	Particle size analysis Standard Proctor Atterberg limits Specific gravity of particles Moisture content	RY-SS-04	0-1.5	Compaction stability and settlement potential Geotechnical properties
	Soil	Total recoverable metals Agricultural ABA Moisture content	RY-SS-04	2-4	Background Ability to support vegetation
	Soil	Particle size analysis Standard Proctor Atterberg limits Specific gravity of particles Moisture content	RY-SS-04	8	Compaction stability and settlement potential Geotechnical properties
	Soil	Total recoverable metals Agricultural ABA Moisture content	RY-SS-04	9-11	Background Ability to support vegetation
Test pit #5 – Repository 3	Soil	Total recoverable metals Agricultural ABA Moisture content	RY-SS-05	0–1	Background Ability to support vegetation
	Soil	Particle size analysis Standard Proctor Atterberg limits Specific gravity of particles Moisture content	RY-SS-05	.5-1.5	Compaction stability and settlement potential Geotechnical properties Suitability as borrow source
	Soil	Total recoverable metals Agricultural ABA Moisture content	RY-SS-05	2-4	Background Ability to support vegetation

TABLE 2-1. RECLAMATION INVESTIGATION SAMPLING SUMMARY
BLACK PINE MINE

Sample Location	Matrix	Analysis	Sample Identification Number	Sample Depth (ft)	Rationale
	Soil	Particle size analysis Standard Proctor Atterberg limits Specific gravity of particles Moisture content	RY-SS-05	5	Compaction stability and settlement potential Geotechnical properties Suitability as borrow source
Test pit – proposed repository location near "Old Mill"	Soil	Total recoverable metals Agricultural ABA Moisture content	CML-SS-11	1-3	Characterization of soil Ability to support vegetation
	Soil	Total recoverable metals Agricultural ABA Moisture content	CML-SS-11	8-10	Characterization of soil Ability to support vegetation
	Soil	Particle size analysis Standard Proctor Atterberg limits Specific gravity of particles Moisture content	CML-SS-11	8-10	Compaction stability and settlement potential Geotechnical properties
Boring/Monitoring well - Repository 2	Soil	Total recoverable metals Moisture content	MW-RY-06	0-.5	Background
	Soil	Total recoverable metals Moisture content	MW-RY-06	4-5	Background
	Soil	Particle size analysis Standard Proctor Atterberg limits Specific gravity of particles Permeability	MW-RY-06	3-12	Compaction stability and settlement potential Geotechnical properties
Boring/Monitoring well – Repository 2	Soil	Total recoverable metals Moisture content	MW-RY-07	0-.5	Background
	Soil	Particle size analysis Standard Proctor Atterberg limits Specific gravity of particles Moisture Content	MW-RY-07	.5-3	Compaction stability and settlement potential Geotechnical properties

TABLE 2-1. RECLAMATION INVESTIGATION SAMPLING SUMMARY
BLACK PINE MINE

Sample Location	Matrix	Analysis	Sample Identification Number	Sample Depth (ft)	Rationale
	Soil	Total recoverable metals Moisture content	MW-RY-07	10-11	Background
Boring/Monitoring well – Repository 2	Soil	Total recoverable metals Agricultural ABA Moisture content	MW-RY-08	0-.5	Background Ability to support vegetation
	Soil	Particle size analysis Standard Proctor Atterberg limits Specific gravity of particles Moisture Content	MW-RY-08	8-10	Compaction stability and settlement potential Geotechnical properties
Quality Assurance/Quality Control (QA/QC)					
	Groundwater	Dissolved metals Laboratory parameters	Field Duplicate – duplicate of CMMW-1	–	Measure field variability
	Surface Water	Total recoverable metals Laboratory parameters	BD-1 – duplicate of North Area Spring (N)	–	Measure field variability
	Surface water	Total recoverable metals	CML-Q1-T2 - duplicate of CML-SW-02	–	Measure field variability
	Surface water	Total recoverable metals	CML-Q1-T1 - duplicate of CML-SW-15	–	Measure field variability
	Water	Total recoverable metals	QC-WT-T1	–	Equipment Rinsate

Agricultural analyses includes: pH, cation exchange capacity, conductivity, nitrogen, phosphorus, potassium, organic matter, and lime including a fertilizer requirement.
Field parameters includes: pH, temperature, specific conductance, dissolved oxygen and flow (surface water only).
Total recoverable metals analysis for soil and sediment includes: antimony, arsenic, barium, cadmium, chromium, cobalt, copper, iron, lead, manganese, mercury, nickel, and zinc.
Total RCRA metals analysis for materials includes: arsenic, barium, cadmium, chromium, lead, mercury, selenium, and silver.
Total recoverable metals analysis for water includes: antimony, arsenic, barium, cadmium, chromium, copper, iron, lead, manganese, mercury, nickel, and zinc (Samples collected under Task Order No. 10), and arsenic, cadmium, calcium, copper, iron, lead, magnesium, manganese, and zinc (Samples collected under Task Order No. 9).
Dissolved recoverable metals analysis for water includes: arsenic, cadmium, copper, iron, lead, manganese, and zinc.
Laboratory parameters for water includes: calcium, magnesium, sodium, potassium, sulfate, total alkalinity as CaCO3, total acidity as CaCO3, total dissolved solids, and total suspended solids.
Water laboratory parameters include: hardness, chloride, sulfate, nitrate/nitrite, forms of alkalinity/acidity, and total dissolved solids.
– = Not applicable
ABA =Acid base accounting (total sulfur, sulfate sulfur, pyretic sulfur, and organic sulfur).
AOC = Area of Concern
ASB = Asbestos
BG = Background
CML = Combination Mill AOC
CMN = Combination Mine AOC
ft = feet

TABLE 2-1. RECLAMATION INVESTIGATION SAMPLING SUMMARY
BLACK PINE MINE

HM = Historic Mine AOC
MW= Monitoring well
QC = Quality control
RCRA = RCRA metals
RS = Rock surface (waste rock)
RY = Repository
SB = Soil boring
SD = Sediment
SS = Soil surface
SW=Surface water
TS = Tim Smith Mine AOC (when used at beginning of sample ID)
TS = Tailing surface (when used in middle of sample ID)
USFS – United State Forest Service

TABLE 3-1. SOLID-MATRIX ANALYTICAL RESULTS - TOTAL RECOVERABLE METALS
BACKGROUND SOILS
BLACK PINE MINE

Location	Date Sampled	Sample Start Depth (ft)	Sample End Depth (ft)	Units	Antimony	Arsenic	Barium	Cadmium	Chromium	Cobalt	Copper	Lead	Manganese	Mercury	Nickel	Zinc	Iron	Silver
Risk Based Cleanup Guidelines[a] (mg/kg)					**293**	**40.4[bd]**	**4,975**	**19.5[b]**	**735,000**	**30,500**	**27,100**	**1,100**	**665**	**220**	**14,650**	**220,000**	**NS**	**NS**
RY-SS-01	7/12/2011	0	1	mg/kg	0.48	4.0	284	0.093	6.8	4.3	5.1	6.8	327	0.025 J	13.6	36.8	11800	ND(0.37)
RY-SS-02	7/12/2011	0	1	mg/kg	0.6	7.2	248	0.31	4.4	3.3	5.7	5.4	**782**	0.14 J	8.5	42.7	6090	ND(0.45)
RY-SS-03	7/12/2011	0	1	mg/kg	2.4	8.4	202	0.14	10.1	8.7	12.9	20.4	399	0.062 J	12	37.2	17900	ND(0.55)
RY-SS-04	7/12/2011	0	1	mg/kg	158	**74.7**	247	2.4	3.4	4.0	82.5	1030	**1300**	ND(0.021) UJ	8.3	141	16000	2.7
RY-SS-05	7/12/2011	0	1	mg/kg	2.0	11.1	285	1.0	6.2	5.1	12.6	27.9	**1040**	ND(0.019) UJ	12.2	85.3	11800	ND(0.49)
MW-RY-06	8/16/2011	0	0.5	mg/kg	5.5	13.1	122	0.58	13.2	7.8 J	219	45.6	384	0.026	12.3	53.9	13300	1.5
MW-RY-07	8/17/2011	0	0.5	mg/kg	0.98	7.2	216	0.2	7.6	8.1 J	6.4	13.7	**1840**	0.037	9.6	32	9880	ND(0.48)
MW-RY-08	8/17/2011	0	0.5	mg/kg	19.3	**52.1**	90.2	0.35	3.6	1.7 J	70.7	217	146	0.02	4.4	129	9240	0.83
Mean Concentration[c]					23.7	22.2	212	0.63	6.9	5.4	51.9	171	**777**	0.04	10.1	69.7	12001	3.1

[a] MT DEQ Risk Based Cleanup Guidelines (RBCG) Composite, Conservative Soil Cleanup Guidelines for Recreational Visitors Table 7-10 (DEQ 1996)

[b] Carcinogenic risk of 5E-07

[c] For non detect results, one half of the reporting limit was used in the calculation of the mean concentration

[d] UCL = 95th upper confidence limit on the arithmetic mean background concentration, from background samples

Bold, highlighted values exceed DEQ RBCG values

J – Estimated concentration

UJ – Estimated reporting limit

ft - feet

mg/kg - milligrams per kilogram.

ND() - Analyte was not detected (reporting limit)

NS - A standard has not been adopted

TABLE 3-2. SOLID-MATRIX ANALYTICAL RESULTS - TOTAL RECOVERABLE METALS
COMBINATION MINE AOC
BLACK PINE MINE

Location	Date Sampled	Sample Start Depth (ft)	Sample End Depth (ft)	Units	Antimony	Arsenic	Barium	Cadmium	Chromium	Cobalt	Copper	Lead	Manganese	Mercury	Nickel	Zinc	Iron	Silver
Risk Based Cleanup Guidelines[a] (mg/kg)					**293**	**40.4[bc]**	**4,975**	**19.5[b]**	**735,000**	**30,500**	**27,100**	**1,100**	**665**	**220**	**14,650**	**220,000**	**NS**	**NS**
CMN-SS-04	7/14/2011	0	1	mg/kg	26.2	35.0	180	0.39	4.1	3.7 J	57.8	261	480	ND(0.020) UJ	4.8	81.5	8820	1
CMN-RS-04	7/14/2011	2	4	mg/kg	**424**	**216**	92.2	3.7	1.3	ND(0.76)	309	**1910**	110	0.28 J	1.5	423	9400	50.2
CMN-RS-04	7/14/2011	5	7	mg/kg	**986**	**439**	114	10.2	0.90	ND(0.73)	464	**2750**	36.8	0.13 J	1.1	1040	19400	155
CMN-SS-04	7/14/2011	8	10	mg/kg	0.74	7.9	63.0	0.11	3.7	1.4 J	26.8	5.3	56.9	ND(0.023) UJ	2.5	17.7	5680	ND(0.56)
CMN-SS-05	7/14/2011	0	1	mg/kg	20.2	26.1	298	0.37	4.8	6.1 J	73.6	282	**928**	ND(0.021) UJ	4.9	88.0	8450	1
CMN-RS-05	7/14/2011	5	7	mg/kg	**678**	**467**	244	13.7	3.0	4.1 J	1950	**3050**	**850**	0.27 J	4.4	923	12500	69
CMN-SS-05	7/14/2011	8	10	mg/kg	1.4	7.7	97.0	ND(0.080)	6.7	5.4 J	8.7	14.9	137	ND(0.022) UJ	5.8	25.7	7960	ND(0.5)
CMN-SS-06	7/14/2011	0	1	mg/kg	15.4	22.3	177	0.54	4.1	7.8 J	57.5	217	**910**	ND(0.022) UJ	ND(8.7)	321	6670	1.6
CMN-RS-06	7/14/2011	2	4	mg/kg	**765**	**515**	168	14.9	4.1	2.5 J	1690	**3820**	652	0.26 J	3.9	1150	14400	87.6
CMN-SS-06	7/14/2011	6	8	mg/kg	2.1	7.0	67.9	0.25	5.9	7.0 J	8.8	19.0	342	ND(0.020) UJ	8.0	37.9	6890	ND(0.48)
CMN-SS-07	7/14/2011	0	1	mg/kg	1.5	12.2	85.4	0.41	12.2	6.6 J	30.9	19.7	252	ND(0.021) UJ	8.2	57.0	15300	ND(0.55)
CMN-SS-07	7/14/2011	6	7	mg/kg	1.3	12.4	111	ND(0.088)	11.9	10.3 J	14.9	24.8	393	ND(0.020) UJ	9.7	30.5	14000	ND(0.55)
08	7/14/2011	0	1	mg/kg	3.3	14.4	64.7	1.6	7.6	8.2 J	220	24.4	419	ND(0.022) UJ	4.8	101	11000	ND(0.6)
CMN-SS-08	7/14/2011	3	5	mg/kg	1.1	7.6	136	0.71	8.4	5.2 J	124	14.8	193	ND(0.021) R	5.6	62.7	10300	ND(0.62)
CMN-SS-09	7/14/2011	0	1	mg/kg	1.4	9.7	250	2.7	7.8	6.0 J	489	21.0	460	0.12 J	5.3	131	8270	0.66
CMN-SS-09	7/14/2011	4	6	mg/kg	0.67	8.1	185	1.7	12.1	11.2 J	58.4	20.4	243	61.3 J	7.1	129	14400	ND(0.57)
CMN-SS-10	7/14/2011	0	1	mg/kg	15.0	8.6	237	1.4 J	3.3 J	4.7 J	139	15.8	**1170**	0.044 J	6.1	93.2	6800	1
CMN-SS-10	7/14/2011	4	5	mg/kg	5.4	14.1	136	0.32 J	4.8 J	12.7 J	38.1	24.9	510	0.043 J	7.8	44.8	17100	ND(1.5)
CMN-SS-11	7/14/2011	0	1	mg/kg	16.2	22.5	130	1.2 J	4.8 J	4.3 J	64.2	110	311	0.070 J	5.5	133	8570	2.3
CMN-SS-11	7/14/2011	4	5	mg/kg	4.1	29.5	116	ND(0.079) UJ	6.2 J	12.6 J	18.4	55.4	610	0.030 J	7.2	43.1	27500	0.59
CMN-SS-12	7/14/2011	0	1	mg/kg	9.1	12.3	160	1.1 J	4.3 J	2.5 J	105	59.0	316	0.062 J	14.8	127	6400	2
CMN-SS-12	7/14/2011	4	5	mg/kg	2.1	10.4	222	0.19 J	8.2 J	7.5 J	22.3	23.3	239	0.029 J	8.9	54.0	13300	ND(0.5)
CMN-SS-13	7/14/2011	0	1	mg/kg	**396**	**250**	254	11.2 J	ND(3.0) UJ	4.2 J	885	**1890**	540	1.4 J	5.8	877	11700	70.8
CMN-SS-13	7/14/2011	4	5	mg/kg	2.4	8.3	173	ND(0.093) UJ	9.4 J	4.3 J	14.5	24.4	170	0.026 J	8.0	41.4	13400	0.91
CMN-SS-14	7/14/2011	0	1	mg/kg	3.1	19.1	177	2.8 J	6.8 J	5.6 J	321	19.3	298	0.13 J	6.7	163	15700	ND(1.2)
CMN-SS-14	7/14/2011	4	5	mg/kg	17.4	19.9	312	6.9 J	4.3 J	5.1 J	917	108	602	0.022 J	7.3	279	7080	3.7
CMN-SS-15	7/13/2011	0	0.5	mg/kg	6.6	11.5	63.6	0.60	3.2	2.5	88.5	62.1	226	0.093 J	2.6	55.4	4490	ND(0.53)
CMN-SS-16	7/13/2011	0	0.5	mg/kg	36.7	31.7	89.9	2.9	5.0	5.4	295	182	556	0.25 J	4.9	148	7450	3.2
CMN-SS-17	8/18/2011	0	0.5	mg/kg	12.6	14.5	120	0.86	2.4	4.2 J	89.8	90.4	285	0.041	3.2	79.4	5160	1.6
CMN-SS-18	8/18/2011	0	0.5	mg/kg	3.6	9.1	70.1	1.3	1.2	2.9 J	62.8	23.0	202	0.022	4.0	75.5	6770	0.5
CMN-SS-19	8/18/2011	0	0.5	mg/kg	**1010**	**537**	87.7	**67.0**	ND(0.38)	4.1 J	**56800**	**1860**	**989**	1.1	6.8	4380	13600	105

[a] MT DEQ Risk Based Cleanup Guidelines (RBCG) Composite, Conservative Soil Cleanup Guidelines for Recreational Visitors Table 7-10 (DEQ 1996)

[b] Carcinogenic risk of 5E-07

[c] UCL = 95th upper confidence limit on the arithmetic mean background concentration, from background samples

Bold, highlighted values exceed DEQ RBCG values

J – Estimated concentration

R - Rejected, data not usable

UJ – Estimated reporting limit

ft - feet

mg/kg - milligrams per kilogram.

ND() - Analyte was not detected (reporting limit)

NS - A standard has not been adopted

TABLE 3-3. HISTORICAL SOLID-MATRIX ANALYTICAL RESULTS - METALS
COMBINATION MINE AOC
BLACK PINE MINE

Description	Location	Date Sampled	Sample Start Depth (ft)	Sample End Depth (ft)	Units	Arsenic	Cadmium	Copper	Lead	Manganese	Zinc	Silver
Risk Based Cleanup Guidelines[c] (mg/kg)						**40.4[de]**	**19.5[d]**	**27,100.0**	**1,100.0**	**665.0**	**220,000.0**	**NS**
Background Samples	Background	7/21/1993	0	0	mg/kg	NA*	NA*	NA*	85.8	**1530**	47.4	NA*
	Background	10/25/2000	0	0.17	mg/kg	26	ND(10)	46	110	**2121**	170	NA*
	BGTP-1	7/19/2001	0	1	mg/kg	ND(10)	ND(10)	12	22	151	ND(10)	NA*
	BGTP-1	7/19/2001	1	2	mg/kg	ND(10)	ND(10)	13	14	98	ND(10)	NA*
	BGTP-1	7/19/2001	2	3	mg/kg	ND(10)	ND(10)	19	30	244	36	NA*
	BGTP-2	7/19/2001	0	1	mg/kg	ND(10)	ND(10)	12	19	348	ND(10)	NA*
	BGTP-2	7/19/2001	1	2	mg/kg	ND(10)	ND(10)	11	16	244	ND(10)	NA*
	BGTP-2	7/19/2001	2	3	mg/kg	ND(10)	ND(10)	17	25	356	ND(10)	NA*
Average[a]					mg/kg	8.00	5.00	18.57	40.23	637	34.80	NA*
2000 Hydrometrics Surface Soil Samples - Devegetated Area and Peripheral Area[b,f]	CMMS-1	10/25/2000	0	0.17	mg/kg	21	14	7655	63	**2546**	797	ND(20)
	CMMS-1	10/25/2000	0	0.17	mg/kg	22	ND(10)	62	83	**2309**	124	ND(20)
	CMMS-2	10/25/2000	0	0.17	mg/kg	18	**24**	11316	97	**2368**	1178	ND(20)
	CMMS-3	10/25/2000	0	0.17	mg/kg	23	ND(10)	2391	79	**2120**	377	ND(20)
	CMMS-3	10/25/2000	0	0.17	mg/kg	21	ND(10)	547	42	**2127**	246	ND(20)
	CMMS-4	10/25/2000	0	0.17	mg/kg	**46**	ND(10)	1009	268	552	131	ND(20)
	CMMS-5	10/25/2000	0	0.17	mg/kg	34	16	1296	155	**1003**	413	ND(20)
	CMMS-5	10/25/2000	0	0.17	mg/kg	12	ND(10)	217	59	**1451**	165	ND(20)
	CMNS-1	10/24/2000	0	0.17	mg/kg	**74**	19	913	179	**998**	593	ND(20)
	CMNS-1	10/25/2000	0	0.17	mg/kg	17	14	985	69	**2804**	657	ND(20)
	CMNS-2	10/24/2000	0	0.17	mg/kg	**44**	ND(10)	1259	82	**1687**	291	ND(20)
	CMSS-1	10/24/2000	0	0.5	mg/kg	36	ND(10)	437	324	**951**	358	ND(20)
	CMSS-2	10/24/2000	0	0.17	mg/kg	**1175**	**45**	1029	**8058**	186	4688	261
	CMSS-2	10/24/2000	0	0.17	mg/kg	**41**	ND(10)	830	451	**1042**	355	ND(20)
	CMSS-3	10/24/2000	0	0.17	mg/kg	**974**	**55**	888	**5936**	172	5848	210
	CMSS-3	10/24/2000	0	0.17	mg/kg	29	ND(10)	98	113	**2759**	299	ND(20)
	CMSS-4	10/24/2000	0	0.5	mg/kg	**1916**	**69**	1245	**13211**	264	8915	413
	CMSS-4/5	10/24/2000	0	0.17	mg/kg	13	ND(10)	29	64	**1232**	75	ND(20)
	CMSS-5	10/24/2000	0	0.5	mg/kg	**363**	15	1849	**2613**	**962**	694	65
Average[a]					mg/kg	**256.8**	**22.47**	1792	**1681**	**1449**	1379	58
2000 Hydrometrics Subsurface Soil Samples - Devegetated Area and Peripheral Area[b,f]	CMSS-2	10/24/2000	0.17	0.5	mg/kg	35	ND(10)	1621	187	**1332**	496	ND(20)
	CMSS-3	10/24/2000	0.17	0.5	mg/kg	26	ND(10)	1624	199	**1751**	427	ND(20)
	CMMS-1	10/25/2000	0.5	0.67	mg/kg	16	ND(10)	2134	47	**1747**	273	ND(20)
	CMMS-2	10/25/2000	0.5	0.67	mg/kg	18	11	2912	59	**1758**	384	ND(20)
	CMMS-3	10/25/2000	0.5	0.67	mg/kg	ND(10)	ND(10)	573	24	522	160	ND(20)
	CMMS-4	10/25/2000	0.5	0.67	mg/kg	12	ND(10)	506	68	565	120	ND(20)
	CMMS-5	10/25/2000	0.5	0.67	mg/kg	ND(10)	ND(10)	433	37	449	231	ND(20)
	CMNS-1	10/24/2000	0.5	0.67	mg/kg	12	ND(10)	230	23	212	96	ND(20)
	CMNS-2	10/24/2000	0.5	0.67	mg/kg	14	ND(10)	336	13	659	138	ND(20)
	CMSS-4	10/24/2000	0.5	0.67	mg/kg	29	ND(10)	383	109	**681**	127	ND(20)
Average[a]					mg/kg	17.20	5.67	1075	76.60	**967.6**	245.2	10.0
2000 and 2001 Hydrometrics Waste Rock Samples	Combination Pad Center Trench	7/19/2001	0	6	mg/kg	**274**	7	1080	**1540**	100	710	62
	Combination Pad North Composite	7/19/2001	0	1.5	mg/kg	**332**	8	863	**2620**	299	555	70
	Combination Pad North Trench	7/19/2001	0	6	mg/kg	**274**	13	1020	**2080**	353	1400	115
	Combination Pad South Composite	7/19/2001	0	1.5	mg/kg	**403**	**20**	1430	**3070**	390	1600	72
	Combination Pad South Trench	7/19/2001	0	6	mg/kg	**341**	14	1190	**2050**	380	762	134
	CWD-N	10/25/2000	0	0.5	mg/kg	**444**	14	1024	**2710**	184	1209	90
	CWD-S	10/25/2000	0	0.5	mg/kg	**904**	**37**	3402	**6393**	655	2578	179
Average[a]					mg/kg	**425**	16.14	1430	**2923**	337.3	1259	103

TABLE 3-3. HISTORICAL SOLID-MATRIX ANALYTICAL RESULTS - METALS
COMBINATION MINE AOC
BLACK PINE MINE

Description	Location	Date Sampled	Sample Start Depth (ft)	Sample End Depth (ft)	Units	Arsenic	Cadmium	Copper	Lead	Manganese	Zinc	Silver
Risk Based Cleanup Guidelines[c] (mg/kg)						**40.4[de]**	**19.5[d]**	**27,100.0**	**1,100.0**	**665.0**	**220,000.0**	**NS**
2001 Hydrometrics Surface Soil Samples	NTP-1	7/19/2001	0	1	mg/kg	**43**	ND(10)	251	53	312	108	NA*
	NTP-2	7/19/2001	0	1	mg/kg	ND(10)	ND(10)	90	18	271	187	NA*
	NTP-3	7/19/2001	0	1	mg/kg	11	ND(10)	307	26	440	133	NA*
	NTP-4	7/19/2001	0	1	mg/kg	ND(10)	ND(10)	411	23	**728**	143	NA*
	NTP-5	7/19/2001	0	1	mg/kg	ND(10)	ND(10)	787	30	**819**	140	NA*
	NTP-6	7/19/2001	0	1	mg/kg	ND(10)	ND(10)	215	24	**1990**	370	NA*
	NTP-7	7/19/2001	0	1	mg/kg	12	ND(10)	1419	29	**1201**	226	NA*
	NTP-8	7/19/2001	0	1	mg/kg	21	12	3405	58	**2865**	541	NA*
	STP-1	7/19/2001	0	1	mg/kg	20	ND(10)	242	140	231	147	NA*
	STP-2	7/19/2001	0	1	mg/kg	18	ND(10)	360	103	398	148	NA*
	STP-3	7/19/2001	0	1	mg/kg	34	ND(10)	236	241	263	121	NA*
	STP-4	7/19/2001	0	1	mg/kg	14	ND(10)	79	76	254	102	NA*
Average[a]					mg/kg	16.08	5.58	650.2	68.42	**814.3**	197.2	NA*
2001 Hydrometrics Subsurface Soil Samples	NTP-1	7/19/2001	1	2	mg/kg	10	ND(10)	157	21	186	93	NA*
	NTP-1	7/19/2001	2	3	mg/kg	11	ND(10)	141	23	175	88	NA*
	NTP-2	7/19/2001	1	2	mg/kg	ND(10)	ND(10)	135	18	206	138	NA*
	NTP-2	7/19/2001	2	3	mg/kg	ND(10)	ND(10)	111	19	210	117	NA*
	NTP-3	7/19/2001	1	2	mg/kg	ND(10)	ND(10)	135	19	207	81	NA*
	NTP-3	7/19/2001	2	3	mg/kg	ND(10)	ND(10)	106	15	135	77	NA*
	NTP-4	7/19/2001	1	2	mg/kg	ND(10)	ND(10)	122	26	276	53	NA*
	NTP-4	7/19/2001	2	3	mg/kg	14	ND(10)	57	27	360	86	NA*
	NTP-5	7/19/2001	1	2	mg/kg	ND(10)	ND(10)	286	27	253	64	NA*
	NTP-5	7/19/2001	2	3	mg/kg	9	ND(10)	68	14	190	64	NA*
	NTP-6	7/19/2001	1	2	mg/kg	ND(10)	ND(10)	319	26	467	97	NA*
	NTP-6	7/19/2001	2	3	mg/kg	17	ND(10)	40	19	336	51	NA*
	NTP-6	7/19/2001	3	4	mg/kg	14	ND(10)	49	18	219	44	NA*
	NTP-7	7/19/2001	1	2	mg/kg	ND(10)	ND(10)	632	26	427	126	NA*
	NTP-7	7/19/2001	2	3	mg/kg	ND(10)	ND(10)	217	22	204	86	NA*
	NTP-7	7/19/2001	3	4	mg/kg	24	ND(10)	57	25	172	40	NA*
	NTP-8	7/19/2001	1	2	mg/kg	6	ND(10)	119	23	45	61	NA*
	NTP-8	7/19/2001	2	3	mg/kg	ND(10)	ND(10)	211	22	199	76	NA*
	STP-1	7/19/2001	1	2	mg/kg	18	ND(10)	259	124	291	125	NA*
	STP-1	7/19/2001	2	3	mg/kg	ND(10)	ND(10)	241	83	290	158	NA*
	STP-2	7/19/2001	1	2	mg/kg	11	ND(10)	184	45	169	106	NA*
	STP-2	7/19/2001	2	3	mg/kg	14	ND(10)	48	60	211	65	NA*
	STP-3	7/19/2001	1	2	mg/kg	ND(10)	ND(10)	106	50	151	78	NA*
	STP-3	7/19/2001	2	3	mg/kg	5	ND(10)	11	25	242	43	NA*
	STP-4	7/19/2001	1	2	mg/kg	ND(10)	ND(10)	42	56	169	32	NA*
	STP-4	7/19/2001	2	3	mg/kg	13	ND(10)	18	32	219	17	NA*
Average[a]					mg/kg	8.88	5.00	148.9	33.27	231.1	79.46	NA*
2008 DEQ Surface Soil Samples	S-1	7/11/2008	0	0.17	mg/kg	NA*	NA*	NA*	NA*	NA*	NA*	NA*
	S-2	7/11/2008	0	0.17	mg/kg	ND(5)	ND(1)	370	7.2	NA*	546	NA*
	S-3	7/11/2008	0	0.17	mg/kg	ND(5)	ND(1)	335	17.7	NA*	121	NA*
	S-4	7/11/2008	0	0.17	mg/kg	ND(5)	1.5	1230	23.9	NA*	130	NA*
	S-5	7/11/2008	0	0.17	mg/kg	ND(5)	ND(1)	250	7.2	NA*	110	NA*
	S-6	7/11/2008	0	0.17	mg/kg	12.4	2.7	50.9	24.2	NA*	90.6	NA*
	S-7	7/11/2008	0	0.17	mg/kg	ND(5)	**40.5**	1320	7.1	NA*	1520	NA*
	S-8	7/11/2008	0	0.17	mg/kg	25.2	2.5	172	183	NA*	166	NA*
Average[a]					mg/kg	7.16	6.96	532.6	38.61	NA*	383.4	NA*

TABLE 3-3. HISTORICAL SOLID-MATRIX ANALYTICAL RESULTS - METALS
COMBINATION MINE AOC
BLACK PINE MINE

Description	Location	Date Sampled	Sample Start Depth (ft)	Sample End Depth (ft)	Units	Arsenic	Cadmium	Copper	Lead	Manganese	Zinc	Silver
Risk Based Cleanup Guidelines[c] (mg/kg)						**40.4[de]**	**19.5[d]**	**27,100.0**	**1,100.0**	**665.0**	**220,000.0**	**NS**
2011 RI Waste Rock Samples	CMN-RS-04	7/14/2011	2	4	mg/kg	**216**	3.7	309	**1910**	110	423	50.2
	CMN-RS-04	7/14/2011	5	7	mg/kg	**439**	10.2	464	**2750**	36.8	1040	155
	CMN-RS-05	7/14/2011	5	7	mg/kg	**467**	13.7	1950	**3050**	850	923	69
	CMN-RS-06	7/14/2011	2	4	mg/kg	**515**	14.9	1690	**3820**	652	1150	87.6
Average[a]					mg/kg	**409.3**	10.63	1103	**2883**	412.2	884.0	90.5
2011 RI Surface Soil Samples	CMN-SS-04	7/14/2011	0	1	mg/kg	35	0.39	57.8	261	480	81.5	1
	CMN-SS-05	7/14/2011	0	1	mg/kg	26.1	0.37	73.6	282	**928**	88	1
	CMN-SS-06	7/14/2011	0	1	mg/kg	22.3	0.54	57.5	217	**910**	321	1.6
	CMN-SS-07	7/14/2011	0	1	mg/kg	12.2	0.41	30.9	19.7	252	57	ND(0.55)
	CMN-SS-08	7/14/2011	0	1	mg/kg	14.4	1.6	220	24.4	419	101	ND(0.6)
	CMN-SS-09	7/14/2011	0	1	mg/kg	9.7	2.7	489	21	460	131	0.66
	CMN-SS-10	7/14/2011	0	1	mg/kg	8.6	1.4	139	15.8	**1170**	93.2	1
	CMN-SS-11	7/14/2011	0	1	mg/kg	22.5	1.2	64.2	110	311	133	2.3
	CMN-SS-12	7/14/2011	0	1	mg/kg	12.3	1.1	105	59	316	127	2
	CMN-SS-13	7/14/2011	0	1	mg/kg	**250**	11.2	885	**1890**	540	877	70.8
	CMN-SS-14	7/14/2011	0	1	mg/kg	19.1	2.8	321	19.3	298	163	ND(1.2)
	CMN-SS-15	7/13/2011	0	0.5	mg/kg	11.5	0.6	88.5	62.1	226	55.4	ND(0.53)
	CMN-SS-16	7/13/2011	0	0.5	mg/kg	31.7	2.9	295	182	556	148	3.2
Average[a]					mg/kg	36.57	2.09	217.4	243.3	528.2	182.8	6.5
2011 RI Subsurface Soil Samples	CMN-SS-08	7/14/2011	3	5	mg/kg	7.6	0.71	124	14.8	193	62.7	ND(0.62)
	CMN-SS-09	7/14/2011	4	6	mg/kg	8.1	1.7	58.4	20.4	243	129	ND(0.57)
	CMN-SS-10	7/14/2011	4	5	mg/kg	14.1	0.32	38.1	24.9	510	44.8	ND(0.15)
	CMN-SS-11	7/14/2011	4	5	mg/kg	29.5	ND(0.079)	18.4	55.4	610	43.1	0.59
	CMN-SS-12	7/14/2011	4	5	mg/kg	10.4	0.19	22.3	23.3	239	54	ND(0.5)
	CMN-SS-13	7/14/2011	4	5	mg/kg	8.3	ND(0.093)	14.5	24.4	170	41.4	0.91
	CMN-SS-14	7/14/2011	4	5	mg/kg	19.9	6.9	917	108	602	279	3.7
	CMN-SS-06	7/14/2011	6	8	mg/kg	7	0.25	8.8	19	342	37.9	ND(0.48)
	CMN-SS-07	7/14/2011	6	7	mg/kg	12.4	ND(0.088)	14.9	24.8	393	30.5	ND(0.55)
	CMN-SS-04	7/14/2011	8	10	mg/kg	7.9	0.11	26.8	5.3	56.9	17.7	ND(0.56)
	CMN-SS-05	7/14/2011	8	10	mg/kg	7.7	ND(0.08)	8.7	14.9	137	25.7	ND(0.5)
Average[a]					mg/kg	12.08	0.941	113.8	30.47	317.8	69.62	0.65

[a] For non detect results, one half of the reporting limit was used in the calculation of the average concentration

[b] Sample results did not distinguish between samples collected in the "Devegetated Areas" and in the "Peripheral Areas"

[c] MT DEQ Risk Based Cleanup Guidelines (RBCG) Composite, Conservative Soil Cleanup Guidelines for Recreational Visitors Table 7-10 (DEQ 1996)

[d] Carcinogenic risk of 5E-07

[e] UCL = 95th upper confidence limit on the arithmetic mean background concentration, from background samples

[f] 2000 data was analyzed with XRF and was found to be substantially higher than results for samples collected durign the same time period and analyzed at a laboratory. 2000 data is provided for reference, but is not used for comparisons between RI and historical data.

Bold values exceed DEQ RBCG values

Shading indicates relative concentrations values, dark represents higher relative concentrations

J and UJ qualifiers not shown, refer to Table 3-2 for qualifiers on 2011 data

R - Rejected, data not usable

ft - feet

mg/kg - milligrams per kilogram.

NA* - Not Applicable or not analyzed

ND() - Analyte was not detected (reporting limit)

NS - A standard has not been adopted

Antimony, barium, chromium, cobalt, iron, mercury, nickel, and silver were not analyzed in historical samples.

TABLE 3-4. ACID BASE ACCOUNTING RESULTS
COMBINATION MINE AOC
BLACK PINE MINE

Location	Date Sampled	Sample Start Depth (ft)	Sample End Depth (ft)	Acid Base Potential** (t/1000t)	Acid Potential (t/1000t)	Neutralization Potential (t/1000t)	pH, SMP Buffer (Standard Units)	Recommended Lime (t/1000t)	SMP Lime Requirement (t/1000t)	Sulfur (HCL Extraction) (%)	Sulfur (HNO3 Extraction) (%)	Sulfur (Hot Water Extraction) (%)	Sulfur, Residual (%)	Sulfur, Total (%)
CMN-SS-04	7/14/2011	0	1	0.73	ND(4.3)	0.73 J	7.3	ND(5.4)	0	ND(0.05)	ND(0.05)	ND(0.05)	ND(0.05)	ND(0.05)
CMN-RS-04	7/14/2011	2	4	-5	5	ND(0.5) UJ	6.8	7.5	1	0.132	ND(0.05)	0.223	ND(0.05)	0.415
CMN-RS-04	7/14/2011	5	7	-6.4	6.4	ND(0.5) UJ	6.8	9.2	1	0.127	0.108	0.276	ND(0.05)	0.512
CMN-SS-05	7/14/2011	0	1	0	ND(4.3)	ND(0.5) UJ	7.3	ND(5.4)	0	ND(0.05)	ND(0.05)	ND(0.05)	ND(0.05)	ND(0.05)
CMN-RS-05	7/14/2011	5	7	1.6	4.4	6.1	7.4	5.6	0	ND(0.05)	0.134	0.237	ND(0.05)	0.369
CMN-SS-06	7/14/2011	0	1	0.9	ND(4.3)	0.94	7.3	ND(5.4)	0	ND(0.05)	ND(0.05)	ND(0.05)	ND(0.05)	ND(0.05)
CMN-RS-06	7/14/2011	2	4	4.2	6.5	11	7.4	8.1	0	0.0778	0.144	0.169	ND(0.05)	0.396
CMN-SS-07	7/14/2011	0	1	1.2	ND(4.3)	1.2 J	7.1	ND(5.4)	0	ND(0.05)	ND(0.05)	ND(0.05)	ND(0.05)	ND(0.05)
CMN-SS-07	7/14/2011	6	7	2	ND(4.3)	2 J	6.8	ND(5.4)	0.3	ND(0.05)	ND(0.05)	ND(0.05)	ND(0.05)	ND(0.05)
CMN-SS-08	7/14/2011	0	1	1.7	ND(4.3)	1.7 J	7	ND(5.4)	0	ND(0.05)	ND(0.05)	ND(0.05)	ND(0.05)	ND(0.05)
CMN-SS-08	7/14/2011	3	5	1.7	ND(4.3)	1.7 J	6.8	ND(5.4)	1	ND(0.05)	ND(0.05)	ND(0.05)	ND(0.05)	ND(0.05)
CMN-SS-09	7/14/2011	0	1	1.2	ND(4.3)	1.2 J	6.4	ND(5.4)	3.9	ND(0.05)	ND(0.05)	ND(0.05)	ND(0.05)	ND(0.05)
CMN-SS-09	7/14/2011	4	6	3.7	ND(4.3)	3.7 J	6.9	ND(5.4)	0.3	ND(0.05)	ND(0.05)	ND(0.05)	ND(0.05)	ND(0.05)
CMN-SS-10	7/14/2011	0	1	2.4	ND(4.3)	2.4	6.6	ND(5.4)	2.4	ND(0.05)	ND(0.05)	ND(0.05)	ND(0.05)	ND(0.05)
CMN-SS-11	7/14/2011	0	1	1.5	ND(4.3)	1.5	7.2	ND(5.4)	0	ND(0.05)	ND(0.05)	ND(0.05)	ND(0.05)	ND(0.05)
CMN-SS-11	7/14/2011	4	5	3.2	ND(4.3)	3.2	6.9	ND(5.4)	0.3	ND(0.05)	ND(0.05)	ND(0.05)	ND(0.05)	ND(0.05)
CMN-SS-12	7/14/2011	0	1	2.2	ND(4.3)	2.2	6.8	ND(5.4)	1	ND(0.05)	ND(0.05)	ND(0.05)	ND(0.05)	ND(0.05)
CMN-SS-12	7/14/2011	4	5	3.5	ND(4.3)	3.5	7	ND(5.4)	0	ND(0.05)	ND(0.05)	ND(0.05)	ND(0.05)	ND(0.05)
CMN-SS-13	7/14/2011	0	1	1.5	ND(4.3)	1.5	5.7	13	8.9	ND(0.05)	ND(0.05)	ND(0.05)	ND(0.05)	0.0751
CMN-SS-13	7/14/2011	4	5	3.3	ND(4.3)	3.3	6.9	ND(5.4)	0.3	ND(0.05)	ND(0.05)	ND(0.05)	ND(0.05)	ND(0.05)
CMN-SS-14	7/14/2011	0	1	1.5	ND(4.3)	1.5	6	8.3	6	ND(0.05)	ND(0.05)	ND(0.05)	ND(0.05)	ND(0.05)

J – Estimated concentration
UJ – Estimated reporting limit
ft - feet
t/1000t = tons of Calcium Carbonate ($CaCO_3$) per 1,000 tons waste
ND() - Analyte was not detected (reporting limit)

** Acid/Base Potential = NP - AP
Potentially Acid Generating:
Uncertain Acid Generation Potential:
Unlikely to Generate Acid:

NP:AP < 1 and NNP < -20 tons/kton
NP:AP between 1 and 3 and/or NNP between -20 and +20 tons/kton
NNP < +20 tons/kton

NP = Neutralization Potential
AP = Acid Potential
NNP = Net Neutralizing Potential = Base - Acid Potential

TABLE 3-5. SURFACE WATER (SEEP) ANALYTICAL RESULTS - TOTAL RECOVERABLE METALS
DEQ RISK BASED CLEANUP GUIDELINES
COMBINATION MINE AOC
BLACK PINE MINE

Location	Date Sampled	Discharge (cfs)	Units	Arsenic	Cadmium	Copper	Iron	Lead	Manganese	Zinc
Risk Based Cleanup Guidelines[a] (ug/L)				**0.06[b]**	**66.5**	**472**	**4,979**	**47.1**	**16.6**	**17.2**
CPS-1	5/19/2011	0.05	ug/L	**ND(0.50)**	**173**	**11100 J**	ND(50.0)	0.30	**3680**	**12600 J**
CPS-2	5/19/2011	0.13	ug/L	**3.5**	0.17	21.2 J	1580 J	6.6	13.9	**20.2 J**
CPS-7A	5/19/2011	0.0004	ug/L	**54.7**	52.9	**4320 J**	**41400 J**	**363**	**938**	**4650 J**
CPS-8	5/19/2011	0.0002	ug/L	**3.8**	7.8	339 J	1950 J	7.7	**31.9**	**361 J**
CPS-10B	5/19/2011	0.001	ug/L	**4.5**	**132**	**8600 J**	4700 J	9.2	**2590**	**9720 J**
CPSW-1	5/19/2011	0.1500	ug/L	**3.1**	2.2	89.9 J	1380 J	4.6	**26.7**	**184 J**
CPSW-2	5/19/2011	0.23	ug/L	**2.3**	2.3	126 J	777 J	3.1	**19.3**	**199 J**
DTRD	5/19/2011	0.003	ug/L	**2.9**	**215**	**20900 J**	1140 J	34.3	**6640**	**20400 J**
North Area Spring (N)	5/19/2011	0.01	ug/L	**1.7**	13.4	**638 J**	1340 J	2.8	**113**	**1010 J**
BD-1 (North Area Spring (N))	5/19/2011	0.01	ug/L	**2.0**	13.7	**700 J**	1670 J	3.3	**118**	**1130 J**
North Runoff	5/19/2011	0.03	ug/L	**2.1**	17.9	**666 J**	1460 J	3.2	**152**	**1310 J**

[a] MT DEQ Risk Based Cleanup Guidelines (RBCG) Composite, Conservative Water Cleanup Guidelines for Recreational Visitors Table 7-11 (DEQ 1996)

[b] Carcinogenic risk of 5E-07

Bold, highlighted values exceed DEQ RBCG values

J – Estimated concentration

cfs - cubic feet per second

ug/L = micrograms per liter

ND() - Analyte was not detected (reporting limit)

TABLE 3-6. SURFACE WATER (SEEP) ANALYTICAL RESULTS - TOTAL RECOVERABLE METALS
CIRCULAR DEQ-7 STANDARDS
COMBINATION MINE AOC
BLACK PINE MINE

HUMAN HEALTH STANDARDS (HHS)

Location	Date Sampled	Discharge (cfs)	Units	Arsenic	Cadmium	Copper	Iron	Lead	Manganese	Zinc
Circular DEQ-7 HHS[a] (ug/L)				10[e]	5[e]	1,300[d]	300[f]	15[d]	50[f]	2000[g]
CPS-1	5/19/2011	0.05	ug/L	ND(0.50)	**173**	**11100 J**	ND(50.0)	0.30	**3680**	**12600 J**
CPS-2	5/19/2011	0.13	ug/L	3.5	0.17	21.2 J	**1580 J**	6.6	13.9	20.2 J
CPS-7A	5/19/2011	0.0004	ug/L	**54.7**	**52.9**	**4320 J**	**41400 J**	**363**	**938**	**4650 J**
CPS-8	5/19/2011	0.0002	ug/L	3.8	**7.8**	339 J	**1950 J**	7.7	31.9	361 J
CPS-10B	5/19/2011	0.001	ug/L	4.5	**132**	**8600 J**	**4700 J**	9.2	**2590**	**9720 J**
CPSW-1	5/19/2011	0.1500	ug/L	3.1	2.2	89.9 J	**1380 J**	4.6	26.7	184 J
CPSW-2	5/19/2011	0.23	ug/L	2.3	2.3	126 J	**777 J**	3.1	19.3	199 J
DTRD	5/19/2011	0.003	ug/L	2.9	**215**	**20900 J**	**1140 J**	**34.3**	**6640**	**20400 J**
North Area Spring (N)	5/19/2011	0.01	ug/L	1.7	**13.4**	638 J	**1340 J**	2.8	**113**	1010 J
BD-1 (North Area Spring (N))	5/19/2011	0.01	ug/L	2.0	**13.7**	700 J	**1670 J**	3.3	**118**	1130 J
North Runoff	5/19/2011	0.03	ug/L	2.1	**17.9**	666 J	**1460 J**	3.2	**152**	1310 J

FRESHWATER ACUTE AQUATIC LIFE STANDARDS (AALS)

Location	Date Sampled	Discharge (cfs)	Units	Arsenic	Cadmium	Copper	Iron	Lead	Manganese	Zinc
Circular DEQ-7 AALS[b] (ug/L)				340[d]	0.52[d,h]	3.79[d,h]	NS	13.98[d,h]	NS	37[d,h]
CPS-1	5/19/2011	0.05	ug/L	ND(0.50)	**173**	**11100 J**	ND(50.0)	0.30	3680	**12600 J**
CPS-2	5/19/2011	0.13	ug/L	3.5	0.17	**21.2 J**	1580 J	6.6	13.9	20.2 J
CPS-7A	5/19/2011	0.0004	ug/L	54.7	**52.9**	**4320 J**	41400 J	**363**	938	**4650 J**
CPS-8	5/19/2011	0.0002	ug/L	3.8	**7.8**	**339 J**	1950 J	7.7	31.9	**361 J**
CPS-10B	5/19/2011	0.001	ug/L	4.5	**132**	**8600 J**	4700 J	9.2	2590	**9720 J**
CPSW-1	5/19/2011	0.1500	ug/L	3.1	**2.2**	**89.9 J**	1380 J	4.6	26.7	**184 J**
CPSW-2	5/19/2011	0.23	ug/L	2.3	**2.3**	**126 J**	777 J	3.1	19.3	**199 J**
DTRD	5/19/2011	0.003	ug/L	2.9	**215**	**20900 J**	1140 J	**34.3**	6640	**20400 J**
North Area Spring (N)	5/19/2011	0.01	ug/L	1.7	**13.4**	**638 J**	1340 J	2.8	113	**1010 J**
BD-1 (North Area Spring (N))	5/19/2011	0.01	ug/L	2.0	**13.7**	**700 J**	1670 J	3.3	118	**1130 J**
North Runoff	5/19/2011	0.03	ug/L	2.1	**17.9**	**666 J**	1460 J	3.2	152	**1310 J**

FRESHWATER CHRONIC AQUATIC LIFE STANDARDS (CALS)

Location	Date Sampled	Discharge (cfs)	Units	Arsenic	Cadmium	Copper	Iron	Lead	Manganese	Zinc
Circular DEQ-7 CALS[c] (ug/L)				150[d]	0.097[d,h]	2.85[d,h]	1000[i]	0.545[d,h]	NS	37[d,h]
CPS-1	5/19/2011	0.05	ug/L	ND(0.50)	**173**	**11100 J**	ND(50.0)	0.30	3680	**12600 J**
CPS-2	5/19/2011	0.13	ug/L	3.5	**0.17**	**21.2 J**	**1580 J**	**6.6**	13.9	20.2 J
CPS-7A	5/19/2011	0.0004	ug/L	54.7	**52.9**	**4320 J**	**41400 J**	**363**	938	**4650 J**
CPS-8	5/19/2011	0.0002	ug/L	3.8	**7.8**	**339 J**	**1950 J**	**7.7**	31.9	**361 J**
CPS-10B	5/19/2011	0.001	ug/L	4.5	**132**	**8600 J**	**4700 J**	**9.2**	2590	**9720 J**
CPSW-1	5/19/2011	0.1500	ug/L	3.1	**2.2**	**89.9 J**	**1380 J**	**4.6**	26.7	**184 J**
CPSW-2	5/19/2011	0.23	ug/L	2.3	**2.3**	**126 J**	777 J	**3.1**	19.3	**199 J**
DTRD	5/19/2011	0.003	ug/L	2.9	**215**	**20900 J**	**1140 J**	**34.3**	6640	**20400 J**
North Area Spring (N)	5/19/2011	0.01	ug/L	1.7	**13.4**	**638 J**	**1340 J**	**2.8**	113	**1010 J**
BD-1 (North Area Spring (N))	5/19/2011	0.01	ug/L	2.0	**13.7**	**700 J**	**1670 J**	**3.3**	118	**1130 J**
North Runoff	5/19/2011	0.03	ug/L	2.1	**17.9**	**666 J**	**1460 J**	**3.2**	152	**1310 J**

[a] Human Health Standards (HHS) for Water, Circular DEQ-7, Montana Numeric Water Quality Standards (DEQ 2010)
[b] Freshwater Acute Aquatic Life Standards (AALS), Circular DEQ-7, Montana Numeric Water Quality Standards (DEQ 2010)
[c] Freshwater Chronic Aquatic Life Standards (CALS), Circular DEQ-7, Montana Numeric Water Quality Standards (DEQ 2010)
[d] Priority Pollutant, Circular DEQ-7, Montana Numeric Water Quality Standards (DEQ 2010)
[e] Maximum Contaminant Level, Circular DEQ-7, Montana Numeric Water Quality Standards (DEQ 2010)
[f] Secondary Maximum Contaminant Level based on aesthetic properties, Circular DEQ-7, Montana Numeric Water Quality Standards (DEQ 2010)
[g] Health Advisory, Circular DEQ-7, Montana Numeric Water Quality Standards (DEQ 2010)
[h] @ 25 mg/L hardness, Circular DEQ-7, Montana Numeric Water Quality Standards (DEQ 2010)
[i] Non-Priority Pollutant, Circular DEQ-7, Montana Numeric Water Quality Standards (DEQ 2010)

Bold, highlighted values exceed respective standards
J – Estimated concentration
cfs - cubic feet per second
ug/L - micrograms per liter
NA* - Not applicable or not analyzed
ND() - Analyte was not detected (reporting limit)
NS - A standard has not been adopted

TABLE 3-7. HISTORICAL SURFACE WATER (SEEP) ANALYTICAL RESULTS - METALS
COMBINATION MINE AOC
BLACK PINE MINE

Location	Date Sampled	Metals Analysis[c]	Units	Arsenic	Cadmium	Copper	Iron	Lead	Manganese	Zinc
Risk Based Cleanup Guidelines[a] (ug/L)				**0.06[b]**	**66.5**	**472**	**4,979**	**47.1**	**16.6**	**17.2**
CPS-1	10/4/2000	Dissolved	ug/L	**ND(3)**	**1020**	**78100**	1430	3	**25500**	**81200**
CPS-1	5/21/2001	Dissolved	ug/L	**ND(5)**	**819**	**61000**	NA*	40	**19100**	**52300**
CPS-1	5/30/2001	Dissolved	ug/L	**ND(3)**	**625**	**47600**	260	ND(3)	**14800**	**41100**
CPS-1	7/18/2001	Dissolved	ug/L	**ND(3)**	**991**	**74600**	1870	3	**22200**	**64100**
CPS-1	10/16/2001	Total	ug/L	**ND(5)**	**1370**	**105000**	NA*	ND(10)	**30900**	**89100**
CPS-1	4/23/2004	Dissolved	ug/L	**ND(3)**	**662**	**38000**	ND(30)	ND(3)	**12000**	**42000**
CPS-1	5/31/2005	Dissolved	ug/L	**ND(3)**	**460**	**39680**	240	ND(3)	**10770**	**38020**
CPS-1	9/7/2006	Total	ug/L	**ND(3)**	**339.7**	**25490**	130	ND(3)	**8440**	**25800**
CPS-1	11/2/2006	Total	ug/L	**ND(3)**	**432.7**	**30930**	150	ND(3)	**10530**	**28800**
CPS-1	3/30/2007	Total	ug/L	**ND(3)**	**247.5**	**17480**	300	ND(3)	**6040**	**19060**
CPS-1	4/25/2007	Total	ug/L	**ND(3)**	**197.3**	**15510**	80	ND(3)	**4850**	**15300**
CPS-1	10/11/2007	Total	ug/L	**ND(3)**	**293.7**	**21070**	80	ND(3)	**6970**	**20200**
CPS-1	4/18/2008	Total	ug/L	**4**	**170.9**	**11370**	660	10	**3770**	**12140**
CPS-1	5/7/2008	Total	ug/L	**ND(3)**	**264.8**	**19690**	70	ND(3)	**6430**	**20390**
CPS-1	6/30/2008	Total	ug/L	**ND(3)**	**180**	**13340**	50	ND(3)	**4130**	**13100**
CPS-1	10/30/2008	Total	ug/L	**ND(3)**	**214.8**	**14370**	40	ND(3)	**5060**	**15050**
CPS-1	5/14/2009	Total	ug/L	**ND(3)**	**174.6**	**11300**	40	ND(3)	**3810**	**12370**
CPS-1	5/29/2009	Total	ug/L	**ND(3)**	**152.7**	**10890**	40	ND(3)	**3510**	**11380**
CPS-1	4/27/2010	Total	ug/L	**ND(5)**	**105**	**7710**	130	ND(2)	**2510**	**8200**
CPS-1	5/19/2011	Total Recoverable	ug/L	**ND(0.5)**	**173**	**11100**	ND(50)	0.3	**3680**	**12600**
CPS-10A	4/26/2001	Total	ug/L	**70**	**1200**	**100000**	NA*	**520**	**24900**	**79000**
CPS-10A	6/7/2001	Total	ug/L	**235**	**3820**	**181000**	**66400**	**567**	**70600**	**203000**
DTRD	5/19/2011	Total Recoverable	ug/L	**2.9**	**215**	**20900**	1140	34.3	**6640**	**20400**
CPS-10B	3/30/2007	Total	ug/L	**ND(3)**	**174.4**	**12930**	330	ND(3)	**3850**	**13700**
CPS-10B	4/25/2007	Total	ug/L	**ND(3)**	**76**	**5732**	30	ND(3)	**1680**	**5900**
CPS-10B	5/7/2008	Total	ug/L	**ND(3)**	**188.4**	**13050**	1560	6	**4010**	**14910**
CPS-10B	5/14/2009	Total	ug/L	**ND(3)**	**122.1**	**7785**	80	ND(3)	**2490**	**8460**
CPS-10B	4/27/2010	Total	ug/L	**ND(5)**	49.5	**3280**	180	ND(2)	**830**	**3620**
CPS-10B	5/19/2011	Total Recoverable	ug/L	**4.5**	**132**	**8600**	4700	9.2	**2590**	**9720**

TABLE 3-7. HISTORICAL SURFACE WATER (SEEP) ANALYTICAL RESULTS - METALS
COMBINATION MINE AOC
BLACK PINE MINE

Location	Date Sampled	Metals Analysis[c]	Units	Arsenic	Cadmium	Copper	Iron	Lead	Manganese	Zinc
Risk Based Cleanup Guidelines[a] (ug/L)				**0.06[b]**	**66.5**	**472**	**4,979**	**47.1**	**16.6**	**17.2**
CPS-2	10/4/2000	Dissolved	ug/L	**ND(3)**	ND(0.1)	2	42	ND(3)	**50**	ND(10)
CPS-2	5/30/2001	Dissolved	ug/L	**4**	ND(1)	16	250	4	ND(10)	10
CPS-2	7/18/2001	Dissolved	ug/L	**ND(3)**	1.5	12	130	ND(3)	10	10
CPS-2	4/23/2004	Dissolved	ug/L	**4**	ND(0.1)	ND(1)	120	4	**20**	**20**
CPS-2	5/31/2005	Dissolved	ug/L	**ND(3)**	0.2	10	50	ND(3)	ND(10)	10
CPS-2	9/7/2006	Total	ug/L	**ND(3)**	0.2	16	580	ND(3)	**30**	ND(10)
CPS-2	4/25/2007	Total	ug/L	**6**	0.3	33	4870	18	**30**	**50**
CPS-2	10/11/2007	Total	ug/L	**ND(3)**	ND(0.1)	16	660	5	10	**20**
CPS-2	5/7/2008	Total	ug/L	**5**	0.2	32	3370	11	**20**	**40**
CPS-2	6/30/2008	Total	ug/L	**4**	ND(0.1)	24	1810	7	10	**20**
CPS-2	10/30/2008	Total	ug/L	**3**	0.2	18	790	8	ND(10)	**20**
CPS-2	5/29/2009	Total	ug/L	**4**	1.2	22	1690	7	10	**20**
CPS-2	4/27/2010	Total	ug/L	**ND(5)**	0.2	22	1610	8	**20**	**20**
CPS-2	5/19/2011	Total Recoverable	ug/L	**3.5**	0.17	21.2	1580	6.6	13.9	**20.2**
CPS-7	5/3/2001	Total	ug/L	**ND(5)**	**774**	**45800**	NA*	ND(10)	**16700**	**46600**
CPS-7	5/30/2001	Dissolved	ug/L	**ND(3)**	**580**	**38500**	60	4	**13200**	**38500**
CPS-7	7/18/2001	Dissolved	ug/L	**ND(3)**	**982**	**64000**	110	9	**21000**	**62700**
CPS-7	10/16/2001	Total	ug/L	**ND(5)**	**1160**	**80600**	NA*	ND(10)	**24500**	**75300**
CPS-7A	4/23/2004	Dissolved	ug/L	**7**	**490**	**19000**	ND(30)	**219**	**6900**	**30000**
CPS-7A	4/25/2007	Total	ug/L	**8**	**105**	**4073**	680	**78**	**1460**	**8400**
CPS-7A	5/29/2009	Total	ug/L	**58**	**78.5**	**2699**	3040	**345**	**560**	**6010**
CPS-7A	5/19/2011	Total Recoverable	ug/L	**54.7**	52.9	**4320**	**41400**	**363**	**938**	**4650**
CPS-8	7/18/2001	Dissolved	ug/L	**5**	21	56	20	ND(3)	**80**	**1880**
CPS-8	4/23/2004	Dissolved	ug/L	**4**	4	17	ND(30)	ND(3)	**160**	**280**
CPS-8	5/31/2005	Dissolved	ug/L	**ND(3)**	14.4	159	110	ND(3)	**40**	**1120**
CPS-8	9/7/2006	Total	ug/L	**ND(3)**	5.7	155	1230	4	**160**	**370**
CPS-8	11/2/2006	Total	ug/L	**ND(3)**	4.7	114	1070	5	**30**	**330**
CPS-8	4/25/2007	Total	ug/L	**ND(3)**	1.4	18	350	ND(3)	**20**	**160**
CPS-8	10/11/2007	Total	ug/L	**ND(3)**	2.1	66	390	ND(3)	10	**140**
CPS-8	5/7/2008	Total	ug/L	**4**	5.4	148	2360	6	**60**	**330**
CPS-8	6/30/2008	Total	ug/L	**ND(3)**	4.9	39	110	ND(3)	**30**	**370**
CPS-8	10/30/2008	Total	ug/L	**3**	3.1	94	1870	7	**30**	**260**
CPS-8	5/29/2009	Total	ug/L	**ND(3)**	10.5	84	270	ND(3)	ND(10)	**500**
CPS-8	5/19/2011	Total Recoverable	ug/L	**3.8**	7.8	339	1950	7.7	**31.9**	**361**

TABLE 3-7. HISTORICAL SURFACE WATER (SEEP) ANALYTICAL RESULTS - METALS
COMBINATION MINE AOC
BLACK PINE MINE

Location	Date Sampled	Metals Analysis[c]	Units	Arsenic	Cadmium	Copper	Iron	Lead	Manganese	Zinc
Risk Based Cleanup Guidelines[a] (ug/L)				**0.06[b]**	**66.5**	**472**	**4,979**	**47.1**	**16.6**	**17.2**
CPS-9	4/30/2001	Total	ug/L	**132**	**290**	**20100**	NA*	**1280**	**6730**	**19300**
CPSW-1	10/4/2000	Dissolved	ug/L	**2**	1	57	100	ND(3)	**150**	**30**
CPSW-1	5/30/2001	Dissolved	ug/L	**ND(3)**	ND(1)	43	180	ND(3)	**60**	**20**
CPSW-1	7/18/2001	Dissolved	ug/L	**ND(3)**	2.2	211	240	ND(3)	**130**	**80**
CPSW-1	4/23/2004	Dissolved	ug/L	**3**	ND(0.1)	ND(1)	ND(30)	ND(3)	10	ND(10)
CPSW-1	5/31/2005	Dissolved	ug/L	**ND(3)**	2.5	68	ND(30)	ND(3)	**30**	**160**
CPSW-1	4/25/2007	Total	ug/L	**4**	10.1	**515**	3720	10	**250**	**780**
CPSW-1	5/7/2008	Total	ug/L	**4**	12.1	**578**	3100	8	**220**	**1020**
CPSW-1	6/30/2008	Total	ug/L	**3**	0.3	31	1750	5	**40**	**40**
CPSW-1	10/30/2008	Total	ug/L	**ND(3)**	0.6	45	1670	4	**30**	**50**
CPSW-1	5/29/2009	Total	ug/L	**ND(3)**	1.5	53	1270	3	**30**	**50**
CPSW-1	4/27/2010	Total	ug/L	**ND(5)**	0.3	25	1460	6	**20**	**30**
CPSW-1	5/19/2011	Total Recoverable	ug/L	**3.1**	2.2	89.9	1380	4.6	**26.7**	**184**
CPSW-2	5/30/2001	Dissolved	ug/L	**ND(3)**	27.7	233	20	ND(3)	**800**	**1900**
CPSW-2	7/18/2001	Dissolved	ug/L	**ND(3)**	16.9	134	120	4	**1780**	**510**
CPSW-2	4/23/2004	Dissolved	ug/L	**ND(3)**	9	55	ND(30)	ND(3)	**160**	**460**
CPSW-2	5/31/2005	Dissolved	ug/L	**ND(3)**	14.4	314	190	ND(3)	**90**	**1240**
CPSW-2	9/7/2006	Total	ug/L	**4**	3.7	221	2690	6	**1690**	**170**
CPSW-2	4/25/2007	Total	ug/L	**3**	8.4	372	2690	8	**90**	**690**
CPSW-2	10/11/2007	Total	ug/L	**ND(3)**	3.6	64	700	ND(3)	**1390**	**310**
CPSW-2	5/7/2008	Total	ug/L	**3**	10.9	367	2330	7	**210**	**1080**
CPSW-2	6/30/2008	Total	ug/L	**4**	3.2	141	970	ND(3)	**380**	**190**
CPSW-2	10/30/2008	Total	ug/L	**ND(3)**	2.5	155	2440	6	**410**	**220**
CPSW-2	5/29/2009	Total	ug/L	**ND(3)**	4.6	227	1010	ND(3)	**80**	**270**
CPSW-2	4/27/2010	Total	ug/L	**ND(5)**	2.2	226	1300	5	**70**	**230**
CPSW-2	5/19/2011	Total Recoverable	ug/L	**2.3**	2.3	126	777	3.1	**19.3**	**199**
North Area Spring (N)	5/7/2008	Total	ug/L	**3**	5.1	213	3160	9	**70**	**440**
North Area Spring (N)	5/14/2009	Total	ug/L	**ND(3)**	4.5	250	2410	6	**30**	**400**
North Area Spring (N)	4/27/2010	Total	ug/L	**ND(5)**	5	231	2360	8	**30**	**390**
North Area Spring (N)	5/19/2011	Total Recoverable	ug/L	**2**	13.7	**700**	1670	3.3	**118**	**1130**
North Area Spring (S)	5/7/2008	Total	ug/L	**ND(3)**	26.5	**1334**	1590	4	**330**	**2110**

TABLE 3-7. HISTORICAL SURFACE WATER (SEEP) ANALYTICAL RESULTS - METALS
COMBINATION MINE AOC
BLACK PINE MINE

Location	Date Sampled	Metals Analysis[c]	Units	Arsenic	Cadmium	Copper	Iron	Lead	Manganese	Zinc
Risk Based Cleanup Guidelines[a] (ug/L)				**0.06[b]**	**66.5**	**472**	**4,979**	**47.1**	**16.6**	**17.2**
North Drainage Runoff	5/31/2005	Dissolved	ug/L	**ND(3)**	**306.6**	**18790**	70	ND(3)	**7160**	**22500**
North Drainage Runoff	3/30/2007	Total	ug/L	**8**	**83.5**	**4729**	**11210**	20	**2420**	**6150**
North Drainage Runoff	4/25/2007	Total	ug/L	**ND(3)**	**103.8**	**7244**	240	ND(3)	**2780**	**7650**
North Drainage Runoff	4/18/2008	Total	ug/L	**18**	28.1	**1334**	**23040**	45	**1230**	**2270**
North Drainage Runoff	5/7/2008	Total	ug/L	**ND(3)**	40.9	**2178**	2160	5	**630**	**3300**
North Drainage Runoff	5/29/2009	Total	ug/L	**ND(3)**	35.5	**1466**	560	ND(3)	**600**	**2340**
North Drainage Runoff	4/27/2010	Total	ug/L	**ND(5)**	8.6	309	2430	7	**70**	**670**
North Runoff	5/19/2011	Total Recoverable	ug/L	**2.1**	17.9	**666**	1460	3.2	**152**	**1310**
NRAD	5/31/2005	Dissolved	ug/L	**ND(3)**	**345.4**	**19280**	ND(30)	5	**6980**	**24520**
NRAD	3/30/2007	Total	ug/L	**47**	**167.6**	**11730**	**68000**	**164**	**5910**	**11940**
NRAD	4/25/2007	Total	ug/L	**ND(3)**	**121.3**	**7987**	500	ND(3)	**3030**	**8940**
NRAD	4/18/2008	Total	ug/L	**19**	**79.6**	**5980**	**42300**	**54**	**2600**	**6060**
NRAD	5/7/2008	Total	ug/L	**ND(3)**	43.6	**2204**	2680	6	**740**	**3570**
NRAD	6/30/2008	Total	ug/L	**ND(3)**	47.3	**769**	80	ND(3)	**780**	**3480**
NRAD	5/29/2009	Total	ug/L	**ND(3)**	43.4	**1162**	100	ND(3)	**760**	**2960**
SRAD	5/31/2005	Dissolved	ug/L	**ND(3)**	37.2	**586**	120	6	**1640**	**3410**
SRAD	4/25/2007	Total	ug/L	**7**	31	343	1920	26	**880**	**3500**
SRAD	4/18/2008	Total	ug/L	**66**	15.9	**639**	**49850**	**369**	**740**	**1700**
SRAD	5/7/2008	Total	ug/L	**25**	14.2	313	**12990**	**109**	**430**	**1640**
W-01	7/27/1981	Total	ug/L	**ND(5)**	4	**500**	110	ND(10)	**70**	**180**
W-1	7/11/2008	Total	ug/L	**ND(3)**	42.8	**1000**	50	ND(2)	NA*	**3570**
W-2	7/11/2008	Total	ug/L	**ND(3)**	0.1	9	880	2	NA*	**20**
W-3	7/11/2008	Total	ug/L	**3**	0.2	18	1060	2	NA*	**20**
W-4	7/11/2008	Total	ug/L	**ND(3)**	50.2	**3538**	40	ND(2)	NA*	**3870**
W-5	7/11/2008	Total	ug/L	**ND(3)**	**148.6**	**5020**	ND(30)	4	NA*	**12440**

[a] MT DEQ Risk Based Cleanup Guidelines (RBCG) Composite, Conservative Water Cleanup Guidelines for Recreational Visitors Table 7-11 (DEQ 1996)

[b] Carcinogenic risk of 5E-07

[c] For samples where both dissolved and total metals analysis were performed, the result shown is for the total metals analysis.

Bold values exceed DEQ RBCG values

Shading indicates relative concentrations values, dark represents higher relative concentrations

J and UJ qualifiers not shown, refer to Table 3-5 for qualifiers on 2011 data

ug/L = micrograms per liter

NA* - Not Applicable or not analyzed

ND() - Analyte was not detected (reporting limit)

NRAD - North Removal Area Drainage

SRAD - South Removal Area Drainage

TABLE 3-8. GROUNDWATER ANALYTICAL RESULTS - DISSOLVED METALS
HUMAN HEALTH STANDARDS, CIRCULAR DEQ-7
COMBINATION MINE AOC
BLACK PINE MINE

Location	Date Sampled	Depth to Water (ft)	Units	Arsenic	Cadmium	Copper	Iron	Lead	Manganese	Zinc
Circular DEQ-7 HHS[a] (ug/L)				**10[d]**	**5[d]**	**1,300[c]**	**300[b]**	**15[c]**	**50[b]**	**2,000[e]**
CMMW-1	5/5/2011	52.00	ug/L	1.6	0.13	1.3 J	**550 J**	0.9 J	7.1 J	6.1
Field Duplicate (CMMW-1)	5/5/2011	52.00	ug/L	1.2	0.1	0.93 J	73 J	0.15 J	3.6 J	ND(5)
CMMW-2	5/5/2011	42.09	ug/L	**108**	**14.5**	239	121 J	8.6 J	**103**	1410
CMMW-3	5/5/2011	27.77	ug/L	ND(0.5)	**170**	**12100**	ND(50) UJ	0.31 J	**4280**	**12200**
CMMW-4	5/5/2011	0.00	ug/L	ND(0.5)	**51.9**	**3120**	ND(50) UJ	0.12 J	**884**	**3940**
CMMW-5	5/5/2011	58.11	ug/L	3	**152**	**7100**	**988 J**	**23.2 J**	**4040**	**10700**
CMMW-6	5/5/2011	37.11	ug/L	1.9	0.53	19.4	**661 J**	4.1 J	19.9	33.3
CMMW-7	5/5/2011	50.72	ug/L	2.2	**305**	**22200**	**2050 J**	2.6 J	**7740**	**22300**
CMMW-8	5/5/2011	43.73	ug/L	0.57	**155**	**8420**	281 J	0.48 J	**4550**	**12300**
CMMW-9	5/5/2011	35.35	ug/L	0.72	**6.9**	24.1	197 J	0.38 J	**86.4**	709

[a] Human Health Standards (HHS) for Water, Circular DEQ-7, Montana Numeric Water Quality Standards (DEQ 2010)

[b] Secondary Maximum Contaminant Level based on aesthetic properties, Circular DEQ-7, Montana Numeric Water Quality Standards (DEQ 2010)

[c] Priority Pollutant, Circular DEQ-7, Montana Numeric Water Quality Standards (DEQ 2010)

[d] Maximum Contaminant Level, Circular DEQ-7, Montana Numeric Water Quality Standards (DEQ 2010)

[e] Health Advisory, Circular DEQ-7, Montana Numeric Water Quality Standards (DEQ 2010)

Bold, highlighted values exceed HHS values

J – Estimated concentration

UJ – Estimated reporting limit

ft - feet

ug/L = micrograms per liter

ND() - Analyte was not detected (reporting limit)

TABLE 3-9. HISTORICAL GROUNDWATER ANALYTICAL RESULTS - DISSOLVED METALS
COMBINATION MINE AOC
BLACK PINE MINE

Location	Date Sampled	Units	Arsenic	Cadmium	Copper	Iron	Lead	Manganese	Zinc
CMMW-1	11/9/2001	ug/L	ND(3)	0.8	4	30	ND(3)	**110**	50
CMMW-1	9/7/2006	ug/L	ND(3)	0.3	3	40	ND(3)	20	ND(10)
CMMW-1	5/9/2007	ug/L	ND(3)	ND(0.1)	3	40	ND(3)	10	ND(10)
CMMW-1	10/11/2007	ug/L	ND(3)	0.2	ND(1)	170	ND(3)	ND(10)	ND(10)
CMMW-1	5/7/2008	ug/L	ND(3)	0.2	1	40	ND(3)	10	ND(10)
CMMW-1	6/30/2008	ug/L	ND(3)	ND(0.1)	ND(1)	70	ND(3)	20	ND(10)
CMMW-1	10/30/2008	ug/L	ND(3)	0.2	ND(1)	ND(10)	ND(3)	ND(10)	ND(10)
CMMW-1	5/29/2009	ug/L	ND(3)	1.6	ND(1)	80	ND(3)	10	ND(10)
CMMW-1	5/18/2010	ug/L	1.3	0.2	3.1	ND(50)	0.54	6.4	27.5
CMMW-1	5/5/2011	ug/L	1.6	0.1	1.3	73	0.15	3.6	6.1
CMMW-2	5/9/2007	ug/L	**207**	**7.4**	795	**520**	**56**	**600**	800
CMMW-2	10/11/2007	ug/L	**215**	**7.6**	554	220	**22**	**450**	670
CMMW-2	5/7/2008	ug/L	**164**	**14.2**	125	**510**	**34**	**470**	1170
CMMW-2	6/30/2008	ug/L	**252**	**8.9**	**1766**	240	**56**	**620**	730
CMMW-2	5/14/2009	ug/L	**135**	**10.3**	534	**390**	**25**	**480**	960
CMMW-2	5/29/2009	ug/L	**137**	**9.9**	460	**300**	**24**	**420**	820
CMMW-2	5/18/2010	ug/L	**129**	**5.8**	658	**868**	**42.1**	**133**	630
CMMW-2	5/5/2011	ug/L	**108**	**14.5**	239	121	8.6	**103**	1410
CMMW-3	11/9/2001	ug/L	ND(3)	**93.7**	**1750**	ND(10)	3	**3120**	**6040**
CMMW-3	9/7/2006	ug/L	6	**58.6**	**1862**	ND(10)	ND(3)	**1690**	**3810**
CMMW-3	5/9/2007	ug/L	ND(3)	**222.1**	**15990**	40	ND(3)	**6370**	**14580**
CMMW-3	10/11/2007	ug/L	ND(3)	**96**	**3658**	120	ND(3)	**2910**	**7360**
CMMW-3	5/7/2008	ug/L	ND(3)	**290.6**	**24900**	50	ND(3)	**8680**	**24800**
CMMW-3	6/30/2008	ug/L	ND(3)	**98**	**5024**	70	ND(3)	**2580**	**7040**
CMMW-3	10/30/2008	ug/L	ND(3)	**78.2**	**3240**	40	ND(3)	**2010**	**6800**
CMMW-3	5/29/2009	ug/L	ND(3)	**70.7**	**2680**	40	ND(3)	**1800**	**5000**
CMMW-3	5/18/2010	ug/L	0.56	**67.8**	**3010**	ND(50)	0.51	**1650**	**4770**
CMMW-3	5/5/2011	ug/L	ND(0.5)	**170**	**12100**	ND(50)	0.31	**4280**	**12200**

TABLE 3-9. HISTORICAL GROUNDWATER ANALYTICAL RESULTS - DISSOLVED METALS
COMBINATION MINE AOC
BLACK PINE MINE

Location	Date Sampled	Units	Arsenic	Cadmium	Copper	Iron	Lead	Manganese	Zinc
CMMW-4	11/9/2001	ug/L	ND(3)	**23**	708	ND(10)	ND(3)	**420**	1320
CMMW-4	9/7/2006	ug/L	ND(3)	**68.6**	**4107**	ND(10)	ND(3)	**1200**	**5580**
CMMW-4	5/9/2007	ug/L	ND(3)	**107.2**	**7740**	200	ND(3)	**2420**	**7660**
CMMW-4	10/11/2007	ug/L	4	**46.6**	**2497**	**1040**	11	**790**	**3420**
CMMW-4	5/7/2008	ug/L	ND(3)	**156.6**	**11920**	10	ND(3)	**3790**	**13690**
CMMW-4	6/30/2008	ug/L	ND(3)	**93**	**5518**	30	ND(3)	**1770**	**6700**
CMMW-4	10/30/2008	ug/L	ND(3)	**49.4**	**2290**	20	ND(3)	**740**	**3390**
CMMW-4	5/29/2009	ug/L	ND(3)	**88.1**	**5340**	20	ND(3)	**1480**	**6750**
CMMW-4	5/18/2010	ug/L	ND(0.5)	**26.3**	**1320**	ND(50)	0.43	**418**	1830
CMMW-4	5/5/2011	ug/L	ND(0.5)	**51.9**	**3120**	ND(50)	0.12	**884**	**3940**
CMMW-5	5/14/2009	ug/L	ND(3)	**53.6**	**2540**	170	4	**1380**	**3940**
CMMW-5	5/29/2009	ug/L	ND(3)	**29**	**1350**	**2300**	**36**	**650**	1970
CMMW-5	5/18/2010	ug/L	0.65	**27.4**	1140	178	2.7	**548**	1920
CMMW-5	5/5/2011	ug/L	3	**152**	**7100**	**988**	**23.2**	**4040**	**10700**
CMMW-6	10/30/2008	ug/L	ND(3)	0.3	3	10	ND(3)	**130**	ND(10)
CMMW-6	5/14/2009	ug/L	ND(3)	0.4	15	**310**	ND(3)	20	20
CMMW-6	5/29/2009	ug/L	ND(3)	2.6	16	**610**	ND(3)	20	20
CMMW-6	5/18/2010	ug/L	1.8	0.5	27.7	**671**	3.2	10.3	28.1
CMMW-6	5/5/2011	ug/L	1.9	0.53	19.4	**661**	4.1	19.9	33.3
CMMW-7	5/14/2009	ug/L	ND(3)	**380**	**28400**	50	ND(3)	**9520**	**27100**
CMMW-7	5/29/2009	ug/L	ND(3)	**289**	**16700**	100	ND(3)	**8250**	**20500**
CMMW-7	5/18/2010	ug/L	0.79	**393**	**25300**	ND(50)	1.6	**9410**	**26200**
CMMW-7	5/5/2011	ug/L	2.2	**305**	**22200**	**2050**	2.6	**7740**	**22300**
CMMW-8	5/14/2009	ug/L	ND(3)	**6.8**	118	10	ND(3)	**430**	400
CMMW-8	5/29/2009	ug/L	ND(3)	4.6	24	**550**	ND(3)	**500**	180
CMMW-8	5/18/2010	ug/L	0.54	**130**	**5390**	ND(50)	1	**3800**	**9640**
CMMW-8	5/5/2011	ug/L	0.57	**155**	**8420**	281	0.48	**4550**	**12300**

TABLE 3-9. HISTORICAL GROUNDWATER ANALYTICAL RESULTS - DISSOLVED METALS
COMBINATION MINE AOC
BLACK PINE MINE

Location	Date Sampled	Units	Arsenic	Cadmium	Copper	Iron	Lead	Manganese	Zinc
CMMW-9	5/14/2009	ug/L	ND(3)	**7.5**	41	70	ND(3)	**740**	450
CMMW-9	5/29/2009	ug/L	ND(3)	**7.9**	38	150	ND(3)	**440**	340
CMMW-9	5/18/2010	ug/L	ND(0.5)	2.8	53.6	ND(50)	0.1	**60.4**	132
CMMW-9	5/5/2011	ug/L	0.72	**6.9**	24.1	197	0.38	**86.4**	709

[a] Human Health Standards (HHS) for Water, Circular DEQ-7, Montana Numeric Water Quality Standards (DEQ 2010)

[b] Secondary Maximum Contaminant Level based on aesthetic properties, Circular DEQ-7, Montana Numeric Water Quality Standards (DEQ 2010)

[c] Priority Pollutant, Circular DEQ-7, Montana Numeric Water Quality Standards (DEQ 2010)

[d] Maximum Contaminant Level, Circular DEQ-7, Montana Numeric Water Quality Standards (DEQ 2010)

[e] Health Advisory, Circular DEQ-7, Montana Numeric Water Quality Standards (DEQ 2010)

Bold values exceed Circular DEQ-7 values

Shading indicates relative concentrations values, dark represents higher relative concentrations

J and UJ qualifiers not shown, refer to Table 3-7 for qualifiers on 2011 data

ug/L = micrograms per liter

ND() - Analyte was not detected (reporting limit)

TABLE 3-10. HISTORICAL GROUNDWATER FLUID LEVELS
COMBINATION MINE AOC
BLACK PINE MINE

Monitoring Well/Point	Mine Pool	CMMW-1		CMMW-2		CMMW-3		CMMW-4		CMMW-5		CMMW-6		CMMW-7		CMMW-8		CMMW-9	
Lithology	NA*	Bedrock- quartzite		Native Soil/Colluvium		Bedrock- siltstone		Native Soils - silt		Fill/Overburden		Bedrock		Bedrock		Bedrock		Overburden/Bedrock	
MP Elevation (ft)	NA*	6061.39		6198.61		6040.98		6001.11		6203.44		6204.73		6070.31		6073.19		6073.53	
Total Depth (ft)[a]	NA*	100		55.15		58		25		63.8		73		53.41		76.9		37.78	
3/26/2008	6061.50	NM*	-	NM*	-	NM*	-	NM*		NM*	-	NM*	-	NM*	-	NM*	-	NM*	-
4/9/2008	6061.50	NM*	-	NM*	-	NM*	-	NM*		NM*	-	NM*	-	NM*	-	NM*	-	NM*	-
4/18/08	6061.08	54.95	6006.44	42.83	6155.78	45.31	5995.67	6.87	5994.24	NM*	-	NM*	-	NM*	-	NM*	-	NM*	-
4/26/08	NM*	55.29	6006.1	42.22	6156.39	32.33	6008.65	flowing	6001.11	NM*	-	NM*	-	NM*	-	NM*	-	NM*	-
4/29/08	6063.31	55.20	6006.19	41.2	6157.41	28.45	6012.53	flowing	6001.11	NM*	-	NM*	-	NM*	-	NM*	-	NM*	-
5/5/08	NM*	55.25	6006.14	40.60	6158.01	25.69	6015.29	flowing	6001.11	NM*	-	NM*	-	NM*	-	NM*	-	NM*	-
5/7/08	6068.58	55.24	6006.15	40.95	6157.66	25.10	6015.88	flowing	6001.11	NM*	-	NM*	-	NM*	-	NM*	-	NM*	-
5/15/08	6071.99	54.7	6006.69	39.4	6159.21	28.45	6012.53	flowing	6001.11	NM*	-	NM*	-	NM*	-	NM*	-	NM*	-
5/21/08	6075.25	53.9	6007.49	42.5	6156.11	28.7	6012.28	flowing	6006.86	NM*	-	NM*	-	NM*	-	NM*	-	NM*	-
5/28/08	6075.90	54	6007.39	42.3	6156.31	28.5	6012.48	2.6	6004.26	NM*	-	NM*	-	NM*	-	NM*	-	NM*	-
6/4/08	6077.34	53.4	6007.99	42.5	6156.11	29	6011.98	2.5	6004.36	NM*	-	NM*	-	NM*	-	NM*	-	NM*	-
6/11/08	6081.48	53.1	6008.29	43	6155.61	28.6	6012.38	0	6006.86	NM*	-	NM*	-	NM*	-	NM*	-	NM*	-
6/17/08	6083.88	53	6008.39	43.8	6154.81	29.7	6011.28	1.3	6005.56	NM*	-	NM*	-	NM*	-	NM*	-	NM*	-
6/25/08	6084.36	52.6	6008.79	44.7	6153.91	33.2	6007.78	3.8	6003.06	NM*	-	NM*	-	NM*	-	NM*	-	NM*	-
6/30/08	6084.72	52.27	6009.12	44.94	6153.67	36.48	6004.5	0.06	6001.05	NM*	-	NM*	-	NM*	-	NM*	-	NM*	-
7/3/08	6085.08	53.1	6008.29	54.8	6143.81	39.4	6001.58	1.6	5999.51	NM*	-	NM*	-	NM*	-	NM*	-	NM*	-
7/8/08	6084.90	52.5	6008.89	54.8	6143.81	39.6	6001.38	3.6	5997.51	NM*	-	NM*	-	NM*	-	NM*	-	NM*	-
7/16/08	6084.84	51.8	6009.59	54.7	6143.91	41.6	5999.38	5.3	5995.81	NM*	-	NM*	-	NM*	-	NM*	-	NM*	-
7/25/08	6085.08	52.3	6009.09	54.8	6143.81	43.8	5997.18	7.3	5993.81	NM*	-	NM*	-	NM*	-	NM*	-	NM*	-
8/2/08	6085.08	50.8	6010.59	54.7	6143.91	45.9	5995.08	9.5	5991.61	NM*	-	NM*	-	NM*	-	NM*	-	NM*	-
8/8/08	6085.08	51	6010.39	54.7	6143.91	47	5993.98	11.7	5989.41	NM*	-	NM*	-	NM*	-	NM*	-	NM*	-
8/24/08	6085.08	51	6010.39	54.7	6143.91	47.2	5993.78	16.3	5984.81	NM*	-	NM*	-	NM*	-	NM*	-	NM*	-
9/6/08	6085.08	50.7	6010.69	54.8	6143.81	47.2	5993.78	18.1	5983.01	NM*	-	NM*	-	NM*	-	NM*	-	NM*	-
9/29/08	6083.64	50.9	6010.49	54.7	6143.91	47.3	5993.68	22.8	5978.31	NM*	-	NM*	-	NM*	-	NM*	-	NM*	-
10/22/08	6083.52	NM*	-	NM*	-	NM*	-	NM*		NM*	-	NM*	-	NM*	-	NM*	-	NM*	-
10/30/2008	6083.34	50.95	6010.44	54.8	6143.81	47.29	5993.69	20.9	5980.21	NM*	-	NM*	-	NM*	-	NM*	-	NM*	-
11/9/2008	NM*	NM*	-	NM*	-	NM*	-	NM*		NM*	-	NM*	-	NM*	-	NM*	-	NM*	-
11/17/2008	6083.64	49.9	6011.49	54.8	6143.81	47.2	5993.78	16.7	5984.41	NM*	-	NM*	-	NM*	-	NM*	-	NM*	-
11/30/2008	6079.18	49.7	6011.69	54.8	6143.81	47	5993.98	16.5	5984.61	NM*	-	NM*	-	NM*	-	NM*	-	NM*	-
3/2/2009	6075.90	NM*	-	NM*	-	NM*	-	NM*		NM*	-	NM*	-	NM*	-	NM*	-	NM*	-
3/21/2009	6076.31	NM*	-	NM*	-	NM*	-	NM*		NM*	-	NM*	-	NM*	-	NM*	-	NM*	-
4/13/2009	6075.58	51.4	6009.99	54.7	6143.91	43.3	5997.68	4.5	5996.61	58.9	6144.54	43.9	6160.83	51.2	6019.11	83.9	5989.29	35.2	6038.33
4/19/2009	6083.88	52.1	6009.29	42.4	6156.21	28	6012.98	flowing	6001.11	58.2	6145.24	38.3	6166.43	51.6	6018.71	77.8	5995.39	35.2	6038.33
4/26/2009	6084.36	52	6009.39	42	6156.61	26.3	6014.68	flowing	6001.11	57.3	6146.14	36.2	6168.53	48.5	6021.81	61.2	6011.99	35.7	6037.83
5/3/2009	NM*	52.1	6009.29	43.1	6155.51	28.7	6012.28	flowing	6001.11	58.7	6144.74	39.7	6165.03	51.4	6018.91	53.3	6019.89	37.1	6036.43
5/4/2009	6087.80	NM*	-	NM*	-	NM*	-	NM*		57.7	6145.74	35.5	6169.23	51.4	6018.91	50.3	6022.89	35.6	6037.93
5/9/2009	6088.92	51.8	6009.59	41.8	6156.81	28.5	6012.48	0	6001.11	NM*	-	37.2	6167.53	51.3	6019.01	43.2	6029.99	35.6	6037.93
5/17/2009	6089.56	51.9	6009.49	43.5	6155.11	29.7	6011.28	1	6005.86	59.3	6144.14	41.1	6163.63	51.2	6019.11	72.4	6000.79	35.7	6037.83
5/25/2009	6089.77	50.8	6010.59	44.8	6153.81	32.9	6008.08	4	6002.86	61.9	6141.54	47.8	6156.93	51.6	6018.71	64.1	6009.09	35.5	6038.03
5/29/2009	6089.96	NM*	-	NM*	-	NM*	-	NM*		NM*	-	NM*	-	NM*	-	NM*	-	NM*	-
6/7/2009	6090.36	47.8	6013.59	54.9	6143.71	38	6002.98	7.8	5999.06	dry	6139.64	49.4	6155.33	51.5	6018.81	78.5	5994.69	35.5	6038.03
6/13/2009	6090.52	47.5	6013.89	54.9	6143.71	40.6	6000.38	9.9	5996.96	dry	6139.64	50.3	6154.43	51.6	6018.71	76.9	5996.29	35.9	6037.63
6/22/2009	6090.68	47.3	6014.09	54.9	6143.71	42	5998.98	5.7	5995.41	dry	6139.64	50.9	6153.83	51.8	6018.51	74.7	5998.49	36	6037.53
6/30/2009	6090.52	47.3	6014.09	55	6143.61	42.5	5998.48	6.5	5994.61	dry	6139.64	50.7	6154.03	51.2	6019.11	73.3	5999.89	35.5	6038.03
7/13/2009	6090.52	47.1	6014.29	54.8	6143.81	45.1	5995.88	9.1	5992.01	dry	6139.64	52.1	6152.63	52	6018.31	71.1	6002.09	36.1	6037.43
7/19/2009	6090.44	47	6014.39	55	6143.61	46.5	5994.48	10.7	5990.41	dry	6139.64	52.3	6152.43	52.2	6018.11	70.3	6002.89	36.7	6036.83
7/27/2009	6090.52	47	6014.39	54.8	6143.81	47.2	5993.78	13.2	5987.91	dry	6139.64	57.4	6147.33	52	6018.31	69.5	6003.69	36.2	6037.33
8/2/2009	6090.20	46.7	6014.69	dry	6143.46	47.4	5993.58	14.7	5986.41	dry	6139.64	52.5	6152.23	dry	6016.9	69.2	6003.99	36.1	6037.43
8/8/2009	6090.12	46.7	6014.69	dry	6143.46	47.3	5993.68	16.9	5984.21	dry	6139.64	52.2	6152.53	51.9	6018.41	68.9	6004.29	36.3	6037.23
8/17/2009	NM*	46.7	6014.69	dry	6143.46	47.3	5993.68	18.3	5982.81	dry	6139.64	52.7	6152.03	52.1	6018.21	68.3	6004.89	36	6037.53
8/25/2009	6090.12	46.7	6014.69	NM*	-	47.2	5993.78	19.4	5981.71	NM*	-	53	6151.73	52.2	6018.11	67.9	6005.29	38	6035.53
8/31/2009	6089.08	46.8	6014.59	dry	6143.46	47.3	5993.68	20.8	5980.31	dry	6139.64	53.2	6151.53	52.2	6018.11	67.2	6005.99	36.2	6037.33
9/9/2009	6090.20	46.8	6014.59	dry	6143.46	47.4	5993.58	51.6	5949.51	dry	6139.64	53.4	6151.33	52	6018.31	66.2	6006.99	36.1	6037.43
9/14/2009	6090.04	46.6	6014.79	dry	6143.46	47.4	5993.58	22	5979.11	dry	6139.64	53.5	6151.23	dry	6016.9	66.5	6006.69	dry	6035.75
9/21/2009	6088.52	47.3	6014.09	dry	6143.46	47.4	5993.58	22.4	5978.71	dry	6139.64	53.6	6151.13	dry	6016.9	66.5	6006.69	dry	6035.75

TABLE 3-10. HISTORICAL GROUNDWATER FLUID LEVELS
COMBINATION MINE AOC
BLACK PINE MINE

Monitoring Well/Point	Mine Pool	CMMW-1		CMMW-2		CMMW-3		CMMW-4		CMMW-5		CMMW-6		CMMW-7		CMMW-8		CMMW-9	
Lithology	NA*	Bedrock- quartzite		Native Soil/Colluvium		Bedrock- siltstone		Native Soils - silt		Fill/Overburden		Bedrock		Bedrock		Bedrock		Overburden/Bedrock	
MP Elevation (ft)	NA*	6061.39		6198.61		6040.98		6001.11		6203.44		6204.73		6070.31		6073.19		6073.53	
Total Depth (ft)[a]	NA*	100		55.15		58		25		63.8		73		53.41		76.9		37.78	
9/28/2009	6088.44	47	6014.39	dry	6143.46	44.3	5996.68	22.6	5978.51	dry	6139.64	dry	6131.73	dry	6016.9	65.2	6007.99	dry	6035.75
10/5/2009	6088.28	47	6014.39	dry	6143.46	47.4	5993.58	23	5978.11	dry	6139.64	dry	6131.73	dry	6016.9	65.7	6007.49	dry	6035.75
10/12/2009	6088.04	46.8	6014.59	dry	6143.46	47.3	5993.68	23.5	5977.61	dry	6139.64	dry	6131.73	dry	6016.9	65.9	6007.29	dry	6035.75
10/21/2009	6087.96	47.3	6014.09	NM*	-	47.3	5993.68	21.3	5979.81	NM*	-	NM*	-	NM*	-	65.2	6007.99	NM*	-
10/28/2009	6087.80	47.4	6013.99	NM*	-	47.4	5993.58	21.3	5979.81	NM*	-	NM*	-	NM*	-	65.4	6007.79	NM*	-
11/5/2009	6087.64	47.6	6013.79	NM*	-	47.3	5993.68	22.5	5978.61	NM*	-	NM*	-	NM*	-	64.2	6008.99	NM*	-
11/11/2009	6087.72	47.6	6013.79	NM*	-	47.4	5993.58	22.5	5978.61	NM*	-	NM*	-	NM*	-	64.4	6008.79	NM*	-
11/18/2009	6083.88	47.5	6013.89	NM*	-	47.3	5993.68	22.7	5978.41	NM*	-	NM*	-	NM*	-	64.4	6008.79	NM*	-
11/25/2009	6083.88	47.6	6013.79	NM*	-	47.3	5993.68	22.8	5978.31	NM*	-	NM*	-	NM*	-	64.4	6008.79	NM*	-
2/6/2010	6083.52	48.9	6012.49	55	6143.61	47.6	5993.38	24.9	5976.21	65	6138.44	54.3	6150.43	52.8	6017.51	61.2	6011.99	38.8	6034.73
2/13/2010	6083.52	48.8	6012.59	55	6143.61	47.8	5993.18	25	5976.11	65	6138.44	54.2	6150.53	52.8	6017.51	61.3	6011.89	38.8	6034.73
2/20/2010	6083.40	48.7	6012.69	55	6143.61	47.8	5993.18	25.1	5976.01	65	6138.44	54.1	6150.63	52.8	6017.51	61.3	6011.89	38.7	6034.83
2/28/2010	6083.28	48.8	6012.59	55	6143.61	47.8	5993.18	25	5976.11	64.9	6138.54	54.1	6150.63	52.9	6017.41	61.3	6011.89	38.7	6034.83
3/6/2010	6083.15	48.8	6012.59	55	6143.61	47.7	5993.28	25	5976.11	65.1	6138.34	54	6150.73	52.8	6017.51	61.4	6011.79	38.3	6035.23
3/14/2010	6087.80	49	6012.39	55.1	6143.51	47.6	5993.38	24.6	5976.51	65	6138.44	52.7	6152.03	52.8	6017.51	61	6012.19	36.4	6037.13
3/21/2010	6082.79	49.6	6011.79	55	6143.61	47.3	5993.68	14.8	5986.31	65	6138.44	52.7	6152.03	51.9	6018.41	57.2	6015.99	35.9	6037.63
3/27/2010	6082.91	49.6	6011.79	55	6143.61	44.5	5996.48	15	5986.11	65	6138.44	51.8	6152.93	51.9	6018.41	56.4	6016.79	36	6037.53
4/3/2010	6082.91	49	6012.39	dry	6143.46	46.5	5994.48	10.7	5990.41	dry	6139.64	50.4	6154.33	dry	6016.9	53.2	6019.99	35.9	6037.63
4/18/2010	6084.96	49.8	6011.59	41.9	6156.71	44.4	5996.58	6.5	5994.61	60.2	6143.24	44.2	6160.53	51.6	6018.71	49.7	6023.49	36.1	6037.43
5/1/2010	6085.32	49.5	6011.89	44.7	6153.91	30.7	6010.28	2	6004.86	60.7	6142.74	47.6	6157.13	51.7	6018.61	45.7	6027.49	35	6038.53
5/8/2010	6085.72	49.7	6011.69	44.5	6154.11	34.6	6006.38	2	6004.86	63.4	6140.04	48.9	6155.83	dry	6016.9	45.6	6027.59	36	6037.53
5/16/2010	6085.88	49.6	6011.79	44.7	6153.91	36.8	6004.18	1.1	6005.76	62.1	6141.34	48.2	6156.53	51.6	6018.71	47.4	6025.79	36.2	6037.33
5/23/2010	6086.04	48.2	6013.19	46.7	6151.91	38.7	6002.28	2.8	6004.06	62	6141.44	49.3	6155.43	51.7	6018.61	57	6016.19	36.4	6037.13
5/31/2010	6086.36	49.3	6012.09	44.7	6153.91	39.4	6001.58	3.2	6003.66	64	6139.44	48.4	6156.33	51.5	6018.81	55.1	6018.09	36.2	6037.33
6/5/2010	6086.68	48.9	6012.49	43.2	6155.41	38.5	6002.48	3.2	6003.66	63.9	6139.54	44.3	6160.43	52.9	6017.41	54.5	6018.69	34.8	6038.73
6/12/2010	6089.08	48.2	6013.19	44.3	6154.31	35.5	6005.48	0.4	6006.46	dry	6139.64	72.4	6132.33	53	6017.31	52.7	6020.49	35.8	6037.73
6/21/2010	6089.72	48	6013.39	45	6153.61	23.4	6017.58	0	6006.86	64	6139.44	54.3	6150.43	51.9	6018.41	50.3	6022.89	35.5	6038.03
6/26/2010	6090.12	47.5	6013.89	44.3	6154.31	31	6009.98	flowing	6006.86	dry	6139.64	55	6149.73	51.7	6018.61	46.2	6026.99	36.1	6037.43
7/10/2010	6090.12	NM*	-	NM*	-	NM*	-	flowing	6006.86	NM*	-	NM*	-	NM*	-	NM*	-	NM*	-
7/17/2010	6090.12	NM*	-	NM*	-	NM*	-	NM*		NM*	-	NM*	-	NM*	-	NM*	-	NM*	-
7/25/2010	6090.12	NM*	-	NM*	-	NM*	-	NM*		NM*	-	NM*	-	NM*	-	NM*	-	NM*	-
7/31/2010	6090.52	NM*	-	NM*	-	NM*	-	NM*		NM*	-	NM*	-	NM*	-	NM*	-	NM*	-
8/7/2010	6090.52	NM*	-	NM*	-	NM*	-	NM*		NM*	-	NM*	-	NM*	-	NM*	-	NM*	-
8/14/2010	6090.52	NM*	-	NM*	-	NM*	-	NM*		NM*	-	NM*	-	NM*	-	NM*	-	NM*	-
8/21/2010	6090.52	NM*	-	NM*	-	NM*	-	NM*		NM*	-	NM*	-	NM*	-	NM*	-	NM*	-
8/28/2010	6090.52	NM*	-	NM*	-	NM*	-	NM*		NM*	-	NM*	-	NM*	-	NM*	-	NM*	-
9/4/2010	6090.52	NM*	-	NM*	-	NM*	-	NM*		NM*	-	NM*	-	NM*	-	NM*	-	NM*	-
9/13/2010	6090.04	47.4	6013.99	44.8	6153.81	47.3	5993.68	21.4	5979.71	dry	6139.64	52.3	6152.43	51.9	6018.41	58.7	6014.49	35.5	6038.03
9/19/2010	6090.04	47.3	6014.09	44.9	6153.71	47.4	5993.58	22.1	5979.01	dry	6139.64	52.2	6152.53	51.9	6018.41	59	6014.19	36.1	6037.43
9/27/2010	6089.80	47.3	6014.09	44.8	6153.81	47.6	5993.38	22.5	5978.61	dry	6139.64	52.3	6152.43	52.9	6017.41	59	6014.19	36.2	6037.33
10/4/2010	6089.88	47.4	6013.99	44.9	6153.71	47.3	5993.68	22.3	5978.81	dry	6139.64	52.4	6152.33	51.9	6018.41	59.1	6014.09	36.2	6037.33
10/12/2010	6089.64	47.7	6013.69	44.9	6153.71	47.5	5993.48	23.3	5977.81	dry	6139.64	52.5	6152.23	52	6018.31	59.4	6013.79	36	6037.53
10/16/2010	6089.08	47.7	6013.69	44.8	6153.81	47.5	5993.48	23.6	5977.51	dry	6139.64	52.7	6152.03	52	6018.31	59.2	6013.99	36.2	6037.33
10/24/2010	6089.08	47.8	6013.59	45	6153.61	47.5	5993.48	23.7	5977.41	dry	6139.64	52.5	6152.23	52	6018.31	59.5	6013.69	36.1	6037.43
10/31/2010	6089.08	47.6	6013.79	44.9	6153.71	47.6	5993.38	23.9	5977.21	dry	6139.64	52.7	6152.03	52	6018.31	59.3	6013.89	36.2	6037.33
11/7/2010	6089.08	47.7	6013.69	44.9	6153.71	47.6	5993.38	24.3	5976.81	dry	6139.64	52.4	6152.33	52.1	6018.21	59.2	6013.99	36.2	6037.33
11/20/2010	6090.12	NM*	-	NM*	-	NM*	-	NM*		NM*	-	NM*	-	NM*	-	NM*	-	NM*	-
11/28/2010	6090.12	NM*	-	NM*	-	NM*	-	NM*		NM*	-	NM*	-	NM*	-	NM*	-	NM*	-
12/4/2010	6090.12	NM*	-	NM*	-	NM*	-	NM*		NM*	-	NM*	-	NM*	-	NM*	-	NM*	-
12/13/2010	6090.12	NM*	-	NM*	-	NM*	-	NM*		NM*	-	NM*	-	NM*	-	NM*	-	NM*	-
12/20/2010	6090.12	NM*	-	NM*	-	NM*	-	NM*		NM*	-	NM*	-	NM*	-	NM*	-	NM*	-
12/27/2010	6090.12	NM*	-	NM*	-	NM*	-	NM*		NM*	-	NM*	-	NM*	-	NM*	-	NM*	-
1/2/2011	6090.12	NM*	-	NM*	-	NM*	-	NM*		NM*	-	NM*	-	NM*	-	NM*	-	NM*	-
1/9/2011	6090.12	NM*	-	NM*	-	NM*	-	NM*		NM*	-	NM*	-	NM*	-	NM*	-	NM*	-
1/17/2011	6090.12	NM*	-	NM*	-	NM*	-	NM*		NM*	-	NM*	-	NM*	-	NM*	-	NM*	-

TABLE 3-10. HISTORICAL GROUNDWATER FLUID LEVELS
COMBINATION MINE AOC
BLACK PINE MINE

Monitoring Well/Point	Mine Pool	CMMW-1		CMMW-2		CMMW-3		CMMW-4		CMMW-5		CMMW-6		CMMW-7		CMMW-8		CMMW-9	
Lithology	NA*	Bedrock- quartzite		Native Soil/Colluvium		Bedrock- siltstone		Native Soils - silt		Fill/Overburden		Bedrock		Bedrock		Bedrock		Overburden/Bedrock	
MP Elevation (ft)	NA*	6061.39		6198.61		6040.98		6001.11		6203.44		6204.73		6070.31		6073.19		6073.53	
Total Depth (ft)[a]	NA*	100		55.15		58		25		63.8		73		53.41		76.9		37.78	
1/23/2011	6090.12	NM*	-	NM*	-	NM*	-	NM*		NM*	-	NM*	-	NM*	-	NM*	-	NM*	-
2/2/2011	6090.12	NM*	-	NM*	-	NM*	-	NM*		NM*	-	NM*	-	NM*	-	NM*	-	NM*	-
2/6/2011	6090.12	NM*	-	NM*	-	NM*	-	NM*		NM*	-	NM*	-	NM*	-	NM*	-	NM*	-
2/13/2011	6090.12	NM*	-	NM*	-	NM*	-	NM*		NM*	-	NM*	-	NM*	-	NM*	-	NM*	-
2/21/2011	6090.12	NM*	-	NM*	-	NM*	-	NM*		NM*	-	NM*	-	NM*	-	NM*	-	NM*	-
2/28/2011	6090.12	NM*	-	NM*	-	NM*	-	NM*		NM*	-	NM*	-	NM*	-	NM*	-	NM*	-
3/7/2011	6090.12	NM*	-	NM*	-	NM*	-	NM*		NM*	-	NM*	-	NM*	-	NM*	-	NM*	-
3/13/2011	6090.12	NM*	-	NM*	-	NM*	-	NM*		NM*	-	NM*	-	NM*	-	NM*	-	NM*	-
3/21/2011	6090.12	NM*	-	NM*	-	NM*	-	NM*		NM*	-	NM*	-	NM*	-	NM*	-	NM*	-
3/28/2011	6090.12	NM*	-	NM*	-	NM*	-	NM*		NM*	-	NM*	-	NM*	-	NM*	-	NM*	-
4/2/2011	6090.12	NM*	-	NM*	-	NM*	-	NM*		NM*	-	NM*	-	NM*	-	NM*	-	NM*	-
4/11/2011	6090.12	NM*	-	NM*	-	NM*	-	NM*		NM*	-	NM*	-	NM*	-	NM*	-	NM*	-
4/18/2011	6090.12	NM*	-	NM*	-	NM*	-	NM*		NM*	-	NM*	-	NM*	-	NM*	-	NM*	-
4/25/2011	6079.94	NM*	-	NM*	-	NM*	-	flowing	6006.86	NM*	-	NM*	-	NM*	-	NM*	-	NM*	-
4/27/2011	NM*	50.2	6011.19	44	6154.61	31.3	6009.68	flowing	6006.86	59.6	6143.84	41.6	6163.13	51.7	6018.61	45.5	6027.69	35.5	6038.03
5/1/2011	6083.88	50.5	6010.89	43.9	6154.71	29.8	6011.18	flowing	6006.86	59.4	6144.04	42.1	6162.63	51.5	6018.81	44.7	6028.49	35.6	6037.93
5/5/2011	NM*	50.5	6010.89	43.5	6155.11	28	6012.98	flowing	6006.86	58.3	6145.14	37.6	6167.13	50.5	6019.81	43.9	6029.29	35.3	6038.23
5/9/2011	NM*	49.8	6011.59	40.5	6158.11	25.4	6015.58	flowing	6006.86	57.9	6145.54	34.9	6169.83	46.7	6023.61	52.2	6020.99	35.1	6038.43
5/12/2011	6090.68	49.8	6011.59	40	6158.61	24.3	6016.68	flowing	6006.86	57.2	6146.24	33.6	6171.13	44.9	6025.41	43.3	6029.89	35.3	6038.23
5/15/2011	NM*	48.5	6012.89	40.1	6158.51	24.3	6016.68	flowing	6006.86	57.2	6146.24	33.4	6171.33	44.6	6025.71	43.2	6029.99	35.3	6038.23
5/21/2011	6094.74	48.2	6013.19	43	6155.61	28.3	6012.68	flowing	6006.86	58.3	6145.14	37.2	6167.53	51.4	6018.91	44	6029.19	35.8	6037.73
5/28/2011	NM*	47.8	6013.59	43.2	6155.41	28.5	6012.48	flowing	6006.86	58.1	6145.34	37	6167.73	51.5	6018.81	44.4	6028.79	35.8	6037.73
6/4/2011	6094.04	47.5	6013.89	40.5	6158.11	26.7	6014.28	flowing	6006.86	57.2	6146.24	34.5	6170.23	48.1	6022.21	43.7	6029.49	35.6	6037.93
6/12/2011	6093.79	47.2	6014.19	42.2	6156.41	28.2	6012.78	0	6001.11	57.7	6145.74	35.6	6169.13	51	6019.31	43.9	6029.29	35.8	6037.73
6/18/2011	6098.80	46.8	6014.59	43.1	6155.51	28.8	6012.18	0	6001.11	58.5	6144.94	38.2	6166.53	51.5	6018.81	44.2	6028.99	35.8	6037.73
6/24/2011	NM*	46.3	6015.09	44.8	6153.81	33.3	6007.68	flowing	6006.86	62.3	6141.14	48	6156.73	51.5	6018.81	45.5	6027.69	38	6035.53
7/4/2011	NM*	48.8	6012.59	44.8	6153.81	36.7	6004.28	1.1	6000.01	dry	6139.64	49.1	6155.63	51.7	6018.61	49.8	6023.39	35.8	6037.73
7/11/2011	6098.80	45.1	6016.29	44.8	6153.81	38.5	6002.48	3	5998.11	dry	6139.64	49.6	6155.13	51.7	6018.61	52.5	6020.69	36	6037.53
7/18/2011	NM*	45.2	6016.19	44.8	6153.81	40.6	6000.38	5	5996.11	dry	6139.64	50.2	6154.53	51.8	6018.51	54.9	6018.29	36	6037.53
7/24/2011	6103.43	45.2	6016.19	45.8	6152.81	41.8	5999.18	6.2	5994.91	dry	6139.64	51	6153.73	51.4	6018.91	53.2	6019.99	36	6037.53
7/31/2011	NM*	45.1	6016.29	44.8	6153.81	43.2	5997.78	5.4	5995.71	dry	6139.64	51.6	6153.13	52.1	6018.21	57	6016.19	36	6037.53
8/5/2011	6103.14	45.1	6016.29	44.9	6153.71	44.4	5996.58	8.5	5992.61	dry	6139.64	52.1	6152.63	52.1	6018.21	57.7	6015.49	36	6037.53
8/12/2011	6103.14	44.6	6016.79	44.7	6153.91	46	5994.98	10.4	5990.71	dry	6139.64	52	6152.73	52.2	6018.11	58.3	6014.89	36.1	6037.43
8/19/2011	6103.14	45	6016.39	44.9	6153.71	47	5993.98	12.4	5988.71	dry	6139.64	52	6152.73	52.2	6018.11	58.7	6014.49	36	6037.53
8/27/2011	6103.14	44.9	6016.49	45	6153.61	47.3	5993.68	14.5	5986.61	dry	6139.64	52.2	6152.53	52.2	6018.11	59.3	6013.89	36.1	6037.43
9/2/2011	6103.14	44.7	6016.69	44.4	6154.21	47.3	5993.68	16.8	5984.31	dry	6139.64	52.2	6152.53	52.2	6018.11	59.6	6013.59	36.2	6037.33
9/9/2011	6102.84	45.1	6016.29	42.2	6156.41	47.2	5993.78	20.2	5980.91	dry	6139.64	52.2	6152.53	52.2	6018.11	59.2	6013.99	36.1	6037.43
9/10/2011	6102.84	44.6	6016.79	44.9	6153.71	47.3	5993.68	21	5980.11	dry	6139.64	52.3	6152.43	52	6018.31	59.5	6013.69	36	6037.53
9/25/2011	6102.84	45	6016.39	44.9	6153.71	47.4	5993.58	22	5979.11	dry	6139.64	52.3	6152.43	52.3	6018.01	59.5	6013.69	36.1	6037.43
10/2/2011	6099.66	45.2	6016.19	45	6153.61	47.4	5993.58	22.3	5978.81	dry	6139.64	52.3	6152.43	52.2	6018.11	59.5	6013.69	36.2	6037.33
10/23/2011	NM*	45.2	6016.19	45	6153.61	47.5	5993.48	22.5	5978.61	dry	6139.64	52.3	6152.43	52.2	6018.11	59.6	6013.59	36.3	6037.23
10/31/2011	NM*	45.2	6016.19	45	6153.61	47.4	5993.58	22.3	5978.81	dry	6139.64	52.3	6152.43	52.2	6018.11	59.5	6013.69	36.2	6037.33
11/11/2011	6098.46	45.2	6016.19	45	6153.61	47.4	5993.58	22.3	5978.81	dry	6139.64	52.3	6152.43	52.2	6018.11	59.5	6013.69	36.2	6037.33
11/20/2011	6098.29	45.2	6016.19	45	6153.61	47.4	5993.58	22.3	5978.81	dry	6139.64	52.3	6152.43	52.2	6018.11	59.5	6013.69	36.2	6037.33
11/27/2011	6098.29	45.2	6016.19	45	6153.61	47.4	5993.58	22.3	5978.81	dry	6139.64	52.3	6152.43	52.2	6018.11	59.5	6013.69	36.2	6037.33

[a] Total depth represents the total depth measured during the May 5, 2011 sampling event and is measured from the top of the well casing, except for CMMW-4 which is based on the well completion log

ft - feet

MP - Measuring point

NA* - Not applicable

NM* - Not measured

TABLE 3-12. SOLID-MATRIX ANALYTICAL RESULTS - TOTAL RECOVERABLE METALS
TIM SMITH MINE AOC
BLACK PINE MINE

Location	Date Sampled	Sample Start Depth (ft)	Sample End Depth (ft)	Units	Antimony	Arsenic	Barium	Cadmium	Chromium	Cobalt	Copper	Lead	Manganese	Mercury	Nickel	Zinc	Iron	Silver
Risk Based Cleanup Guidelines[a] (mg/kg)					**293**	**40.4[bc]**	**4,975**	**19.5[b]**	**735,000**	**30,500**	**27,100**	**1,100**	**665**	**220**	**14,650**	**220,000**	**NS**	**NS**
TS-RS-01	7/12/2011	4	6	mg/kg	**508**	**629**	241	3.9	1.8	0.94 J	1510	**1880**	248	2.3 J	ND(2.2)	149	26500	63.7
TS-SS-01	7/12/2011	6	8	mg/kg	7.5	11.5	130	0.31	4.8	3.1 J	19.0	28.6	660	0.047 J	5.1	32.3	6920	1.5
TS-SS-02	7/12/2011	2	4	mg/kg	109	**79.8**	146	3.0	4.1	3.0 J	189	328	325	1.0 J	4.8	56.6	7240	17.7
TS-RS-03	7/12/2011	2	4	mg/kg	**712**	**868**	186	6.0	1.7	1.3 J	794	**3060**	125	2.1 J	2.7	144	28100	201
TS-SS-03	7/12/2011	3	5	mg/kg	5.7	11.5	154	0.87	7.5	3.5 J	730	65.7	457	0.029 J	6.5	72.4	11400	ND(0.58)
TS-SS-07	7/13/2011	1	3	mg/kg	64.2	**73.6**	84.1	0.14	10.1	3.6 J	28.2	200	217	0.69 J	6.0	36.3	14600	12.8
TS-RS-07	7/13/2011	4	6	mg/kg	219	**118**	49.3	0.12	5.4	2.5 J	31.3	162	67.6	1.1 J	4.9	18.6	17000	13.5
TS-SS-08	7/13/2011	1	3	mg/kg	23.0	**47.4**	92.5	0.15	17.8	9.3 J	63.0	147	109	0.15 J	9.0	62.1	21000	2.1
TS-SD-01	6/13/2011	0	0.5	mg/kg	37.2	31.1	266	9.1 J	10.7	6.5 J	639	110	**1140**	0.23	24.5	236	10100	6.1 J
TS-SD-02	6/13/2011	0	0.5	mg/kg	3.2	22.4	635	1.1 J	16.0	11.6 J	50.9	65.2	**947**	24.4	20.0	117	24700	ND(1.5) UJ
TS-SD-03	6/14/2011	0	0.5	mg/kg	3.3	20.2	800	1.8	23.5	10.7 J	87.7	39.2	**1150**	0.76	31.2	136	20600	ND(1.4)

[a] MT DEQ Risk Based Cleanup Guidelines (RBCG) Composite, Conservative Soil Cleanup Guidelines for Recreational Visitors Table 7-10 (DEQ 1996)

[b] Carcinogenic risk of 5E-07

[c] UCL = 95th upper confidence limit on the arithmetic mean background concentration, from background samples

Bold, highlighted values exceed DEQ RBCG values

J – Estimated concentration

UJ – Estimated reporting limit

ft - feet

mg/kg - milligrams per kilogram.

ND() - Analyte was not detected (reporting limit)

NS - A standard has not been adopted

TABLE 3-13. HISTORICAL SOLID-MATRIX ANALYTICAL RESULTS - METALS
TIM SMITH MINE AOC
BLACK PINE MINE

Description	Location	Date Sampled	Sample Start Depth (ft)	Sample End Depth (ft)	Units	Antimony	Arsenic	Cadmium	Copper	Lead	Manganese	Mercury	Nickel	Zinc
Risk Based Cleanup Guidelines[b] (mg/kg)						**293.0**	**40.4[cd]**	**19.5[c]**	**27,100**	**1,100**	**665.0**	**220.0**	**14,650**	**220,000**
2001 Hydrometrics Waste Rock Samples	Tim Smith Pad East Composite	7/19/2001	0	1.5	mg/kg	NA*	**669**	13	1160	**3140**	270	NA*	NA*	113
	Tim Smith Pad East Trench	7/19/2001	0	0.5	mg/kg	NA*	**417**	5	910	**1730**	390	NA*	NA*	127
	Tim Smith Pad West Composite	7/19/2001	0	1.5	mg/kg	NA*	**511**	5	848	**2360**	152	NA*	NA*	99
	Tim Smith Pad West Trench	7/19/2001	0	0.5	mg/kg	NA*	**531**	10	1740	**1890**	99	NA*	NA*	155
Average[a]					**mg/kg**	NA*	**532.0**	8.25	1,165	**2,280**	227.8	NA*	NA*	123.5
2011 RI Waste Rock Samples	TS-RS-01	7/12/2011	4	6	mg/kg	**508**	**629**	3.9	1510	**1880**	248	2.3	ND(2.2)	149
	TS-RS-03	7/12/2011	2	4	mg/kg	**712**	**868**	6	794	**3060**	125	2.1	2.7	144
	TS-RS-07	7/13/2011	4	6	mg/kg	219	**118**	0.12	31.3	162	67.6	1.1	4.9	18.6
Average[a]					**mg/kg**	**479.7**	**538.3**	3.34	778.4	**1701**	146.9	1.83	2.90	103.9
2011 RI Soil Samples	TS-SS-01	7/12/2011	6	8	mg/kg	7.5	11.5	0.31	19	28.6	660	0.047	5.1	32.3
	TS-SS-02	7/12/2011	2	4	mg/kg	109	**79.8**	3.0	189	328	325	1	4.8	56.6
	TS-SS-03	7/12/2011	3	5	mg/kg	5.7	11.5	0.87	730	65.7	457	0.029	6.5	72.4
	TS-SS-07	7/13/2011	1	3	mg/kg	64.2	**73.6**	0.14	28.2	200	217	0.69	6	36.3
	TS-SS-08	7/13/2011	1	3	mg/kg	23	**47.4**	0.15	63	147	109	0.15	9	62.1
Average[a]					**mg/kg**	41.88	**44.76**	0.894	205.8	153.9	353.6	0.383	6.28	51.94
2011 RI Sediment Samples	TS-SD-01	6/13/2011	0	0.5	mg/kg	37.2	31.1	9.1	639	110	**1140**	0.23	24.5	236
	TS-SD-02	6/13/2011	0	0.5	mg/kg	3.2	22.4	1.1	50.9	65.2	**947**	24.4	20	117
	TS-SD-03	6/14/2011	0	0.5	mg/kg	3.3	20.2	1.8	87.7	39.2	**1150**	0.76	31.2	136
Average[a]					**mg/kg**	14.57	24.57	4.00	259.2	71.47	**1079**	8.46	25.23	163.0

[a] For non detect results, one half of the reporting limit was used in the calculation of the average concentration
[b] MT DEQ Risk Based Cleanup Guidelines (RBCG) Composite, Conservative Soil Cleanup Guidelines for Recreational Visitors Table 7-10 (DEQ 1996)
[c] Carcinogenic risk of 5E-07
[d] UCL = 95th upper confidence limit on the arithmetic mean background concentration, from background samples
Bold values exceed DEQ RBCG values
Shading indicates relative concentrations values, dark represents higher relative concentrations
J and UJ qualifiers not shown, refer to Table 3-11 for qualifiers on 2011 data
ft - feet
mg/kg - milligrams per kilogram.
NA* - Not Applicable or not analyzed

TABLE 3-14. ACID BASE ACCOUNTING RESULTS
TIM SMITH MINE AOC
BLACK PINE MINE

Location	Date Sampled	Sample Start Depth (ft)	Sample End Depth (ft)	Acid Base Potential** (t/1000t)	Acid Potential (t/1000t)	Neutralization Potential (t/1000t)	pH, SMP Buffer (Standard Units)	Recommended Lime (t/1000t)	SMP Lime Requirement (t/1000t)	Sulfur (HCL Extraction) (%)	Sulfur (HNO3 Extraction) (%)	Sulfur (Hot Water Extraction) (%)	Sulfur, Residual (%)	Sulfur, Total (%)
TS-RS-01	7/12/2011	4	6	0	ND(4.3)	ND(0.5)	7.1	ND(5.4)	0	ND(0.05)	0.0546	0.0639	ND(0.05)	0.141
TS-RS-03	7/12/2011	2	4	0	ND(4.3)	ND(0.5)	6.8	ND(5.4)	1	ND(0.05)	0.0625	0.0695	ND(0.05)	0.161
TS-RS-07	7/13/2011	4	6	0.7	ND(4.3)	0.72	7.3	ND(5.4)	0	ND(0.05)	ND(0.05)	ND(0.05)	ND(0.05)	0.092

ft - feet

t/1000t = tons of Calcium Carbonate ($CaCO_3$) per 1,000 tons waste

ND() - Analyte was not detected (reporting limit)

** Acid/Base Potential = NP - AP

Potentially Acid Generating: NP:AP < 1 and NNP < -20 tons/kton

Uncertain Acid Generation Potential: NP:AP between 1 and 3 and/or NNP between -20 and +20 tons/kton

Unlikely to Generate Acid: NNP < +20 tons/kton

NP = Neutralization Potential

AP = Acid Potential

NNP = Net Neutralizing Potential = Base - Acid Potential

TABLE 3-15. SURFACE WATER ANALYTICAL RESULTS - TOTAL RECOVERABLE METALS
DEQ RISK BASED CLEANUP GUIDELINES
TIM SMITH MINE AOC
BLACK PINE MINE

Location	Date Sampled	Discharge (cfs)	Units	Antimony	Arsenic	Barium	Cadmium	Chromium	Copper	Iron	Lead	Manganese	Mercury	Nickel	Silver	Zinc
Risk Based Cleanup Guidelines[a] (ug/L)				**91.1**	**0.06[b]**	**17,474**	**66.5**	**100,246**	**472**	**4,979**	**47.1**	**16.6**	**0.15**	**931**	**NS**	**17.2**
TSP-3	6/13/2011	4.36	ug/L	0.53	**1.2**	85.1	0.14	1.7	30.5	1180 J	0.86 JB	11.5	0.0128	2.1	ND(0.50)	10.4
TSP-6	6/14/2011	4.50	ug/L	0.53	**1.1**	85.4	ND(0.080)	1.3	22.5	1000	0.97 JB	8.9	0.0132	2.2	ND(0.50)	8.2
TSP-8	6/13/2011	0.67	ug/L	1.2	**1.7**	83.5	0.28	2.3	24.2	2130 J	1.8 JB	13.6	0.0208	3.4	ND(0.50)	**22.3**
TSP-9	6/13/2011	0.51	ug/L	0.57	**1.7**	86.7	0.25	2.9	8.9	2780 J	1.5 JB	**18.8**	0.0199	4.2	ND(0.50)	**19.0**
TSP-10	5/19/2011	0.01	ug/L	NA*	**2.0**	NA*	0.080	NA*	6.3 J	2990 J	2.7	**52.6**	NA*	NA*	NA*	17.1 J

[a] MT DEQ Risk Based Cleanup Guidelines (RBCG) Composite, Conservative Water Cleanup Guidelines for Recreational Visitors Table 7-11 (DEQ 1996)

[b] Carcinogenic risk of 5E-07

Bold, highlighted values exceed DEQ RBCG values

J – Estimated concentration

JB – Estimated concentration due to blank contamination

cfs - cubic feet per second

ug/L = micrograms per liter

NA* - Not applicable or not analyzed

ND() - Analyte was not detected (reporting limit)

NS - A standard has not been adopted

TABLE 3-16. SURFACE WATER ANALYTICAL RESULTS - TOTAL RECOVERABLE METALS
CIRCULAR DEQ-7 STANDARDS
TIM SMITH MINE AOC
BLACK PINE MINE

HUMAN HEALTH STANDARDS (HHS)

Location	Date Sampled	Discharge (cfs)	Units	Antimony	Arsenic	Barium	Cadmium	Chromium	Copper	Iron	Lead	Manganese	Mercury	Nickel	Silver	Zinc
Circular DEQ-7 HHS[a] (ug/L)				**5.6[d]**	**10[e]**	**1,000[f]**	**5[e]**	**100[e]**	**1,300[d]**	**300[f]**	**15[d]**	**50[f]**	**0.05[d]**	**100[g]**	**100[g]**	**2,000[g]**
TSP-3	6/13/2011	4.36	ug/L	0.53	1.2	85.1	0.14	1.7	30.5	**1180 J**	0.86 JB	11.5	0.0128	2.1	ND(0.50)	10.4
TSP-6	6/14/2011	4.50	ug/L	0.53	1.1	85.4	ND(0.080)	1.3	22.5	**1000**	0.97 JB	8.9	0.0132	2.2	ND(0.50)	8.2
TSP-8	6/13/2011	0.67	ug/L	1.2	1.7	83.5	0.28	2.3	24.2	**2130 J**	1.8 JB	13.6	0.0208	3.4	ND(0.50)	22.3
TSP-9	6/13/2011	0.51	ug/L	0.57	1.7	86.7	0.25	2.9	8.9	**2780 J**	1.5 JB	18.8	0.0199	4.2	ND(0.50)	19.0
TSP-10	5/19/2011	0.01	ug/L	NA*	2.0	NA*	0.080	NA*	6.3 J	**2990 J**	2.7	**52.6**	NA*	NA*	NA*	17.1 J

FRESHWATER ACUTE AQUATIC LIFE STANDARDS (AALS)

Location	Date Sampled	Discharge (cfs)	Units	Antimony	Arsenic	Barium	Cadmium	Chromium	Copper	Iron	Lead	Manganese	Mercury	Nickel	Silver	Zinc
Circular DEQ-7 AALS[b] (ug/L)				**NS**	**340[d]**	**NS**	**0.52[d,h]**	**579[d,h]**	**3.79[d,h]**	**NS**	**13.98[d,h]**	**NS**	**1.7[d]**	**145[d,h]**	**0.374[d,h]**	**37[d,h]**
TSP-3	6/13/2011	4.36	ug/L	0.53	1.2	85.1	0.14	1.7	**30.5**	1180 J	0.86 JB	11.5	0.0128	2.1	**ND(0.50)**	10.4
TSP-6	6/14/2011	4.50	ug/L	0.53	1.1	85.4	ND(0.080)	1.3	**22.5**	1000	0.97 JB	8.9	0.0132	2.2	**ND(0.50)**	8.2
TSP-8	6/13/2011	0.67	ug/L	1.2	1.7	83.5	0.28	2.3	**24.2**	2130 J	1.8 JB	13.6	0.0208	3.4	**ND(0.50)**	22.3
TSP-9	6/13/2011	0.51	ug/L	0.57	1.7	86.7	0.25	2.9	**8.9**	2780 J	1.5 JB	18.8	0.0199	4.2	**ND(0.50)**	19.0
TSP-10	5/19/2011	0.01	ug/L	NA*	2.0	NA*	0.080	NA*	**6.3 J**	2990 J	2.7	52.6	NA*	NA*	NA*	17.1 J

FRESHWATER CHRONIC AQUATIC LIFE STANDARDS (CALS)

Location	Date Sampled	Discharge (cfs)	Units	Antimony	Arsenic	Barium	Cadmium	Chromium	Copper	Iron	Lead	Manganese	Mercury	Nickel	Silver	Zinc
Circular DEQ-7 CALS[c] (ug/L)				**NS**	**150[d]**	**NS**	**0.097[d,h]**	**27.7[d,h]**	**2.85[d,h]**	**1000[i]**	**0.545[d,h]**	**NS**	**0.91[d]**	**16.1[d,h]**	**NS**	**37[d,h]**
TSP-3	6/13/2011	4.36	ug/L	0.53	1.2	85.1	**0.14**	1.7	**30.5**	**1180 J**	**0.86 JB**	11.5	0.0128	2.1	ND(0.50)	10.4
TSP-6	6/14/2011	4.50	ug/L	0.53	1.1	85.4	ND(0.080)	1.3	**22.5**	**1000**	**0.97 JB**	8.9	0.0132	2.2	ND(0.50)	8.2
TSP-8	6/13/2011	0.67	ug/L	1.2	1.7	83.5	**0.28**	2.3	**24.2**	**2130 J**	**1.8 JB**	13.6	0.0208	3.4	ND(0.50)	22.3
TSP-9	6/13/2011	0.51	ug/L	0.57	1.7	86.7	**0.25**	2.9	**8.9**	**2780 J**	**1.5 JB**	18.8	0.0199	4.2	ND(0.50)	19.0
TSP-10	5/19/2011	0.01	ug/L	NA*	2.0	NA*	0.080	NA*	**6.3 J**	**2990 J**	**2.7**	52.6	NA*	NA*	NA*	17.1 J

[a] Human Health Standards (HHS) for Water, Circular DEQ-7, Montana Numeric Water Quality Standards (DEQ 2010)
[b] Freshwater Acute Aquatic Life Standards (AALS), Circular DEQ-7, Montana Numeric Water Quality Standards (DEQ 2010)
[c] Freshwater Chronic Aquatic Life Standards (CALS), Circular DEQ-7, Montana Numeric Water Quality Standards (DEQ 2010)
[d] Priority Pollutant, Circular DEQ-7, Montana Numeric Water Quality Standards (DEQ 2010)
[e] Maximum Contaminant Level, Circular DEQ-7, Montana Numeric Water Quality Standards (DEQ 2010)
[f] Secondary Maximum Contaminant Level based on aesthetic properties, Circular DEQ-7, Montana Numeric Water Quality Standards (DEQ 2010)
[g] Health Advisory, Circular DEQ-7, Montana Numeric Water Quality Standards (DEQ 2010)
[h] @ 25 mg/L hardness, Circular DEQ-7, Montana Numeric Water Quality Standards (DEQ 2010)
[i] Non-Priority Pollutant, Circular DEQ-7, Montana Numeric Water Quality Standards (DEQ 2010)

Bold, highlighted values exceed respective standards
J – Estimated concentration
JB – Estimated concentration due to blank contamination
cfs - cubic feet per second
ug/L = micrograms per liter
NA* - Not applicable or not analyzed
ND() - Analyte was not detected (reporting limit)
NS - A standard has not been adopted

TABLE 3-17. HISTORICAL SURFACE WATER ANALYTICAL RESULTS - METALS
TIM SMITH MINE AOC
BLACK PINE MINE

Location	Date Sampled	Metals Analysis[c]	Units	Antimony	Arsenic	Cadmium	Copper	Iron	Lead	Manganese	Mercury	Silver	Zinc
TSP-1	10/4/2000	Dissolved	ug/L	ND(50)	**ND(3)**	0.2	3	ND(10)	ND(3)	ND(10)	**ND(0.6)**	ND(3)	10
TSP-1	6/7/2001	Dissolved	ug/L	ND(50)	**ND(3)**	ND(0.1)	4	50	ND(3)	ND(10)	NA*	ND(3)	ND(10)
TSP-1	7/18/2001	Dissolved	ug/L	ND(50)	**ND(3)**	2.6	4	40	ND(3)	ND(10)	NA*	ND(3)	10
TSP-3[d]	6/13/2011	Total Recoverable	ug/L	0.53	**1.2**	0.14	30.5	1180	0.86	11.5	0.0128	ND(0.5)	10.4
013[e]	7/21/1981	Dissolved	ug/L	NA*	**ND(5)**	ND(1)	ND(10)	260	ND(10)	ND(20)	ND(0.2)	ND(5)	ND(10)
TSP-6	10/4/2000	Dissolved	ug/L	ND(50)	**ND(3)**	ND(0.1)	1	20	ND(3)	ND(10)	**ND(0.6)**	ND(3)	ND(10)
TSP-6	6/7/2001	Dissolved	ug/L	ND(50)	**ND(3)**	ND(0.1)	2	150	ND(3)	ND(10)	NA*	ND(3)	10
TSP-6	7/18/2001	Dissolved	ug/L	ND(50)	**ND(3)**	ND(0.1)	ND(3)	70	ND(3)	ND(10)	NA*	ND(3)	ND(10)
TSP-6	6/14/2011	Total Recoverable	ug/L	0.53	**1.1**	ND(0.08)	22.5	1000	0.97	8.9	0.0132	ND(0.5)	8.2
TSP-7	4/23/2004	Total	ug/L	NA*	**ND(3)**	ND(0.1)	ND(1)	ND(30)	ND(3)	ND(10)	NA*	NA*	ND(10)
TSP-7	5/31/2005	Dissolved	ug/L	NA*	**ND(3)**	ND(0.1)	6	110	ND(3)	ND(10)	NA*	NA*	ND(10)
TSP-8	4/30/2001	Total	ug/L	NA*	**ND(5)**	ND(1)	20	NA*	ND(10)	**40**	NA*	NA*	**40**
TSP-8	6/7/2001	Dissolved	ug/L	ND(50)	**ND(3)**	0.5	17	270	ND(3)	10	NA*	ND(3)	**40**
TSP-8	5/31/2005	Dissolved	ug/L	NA*	**ND(3)**	0.2	15	160	ND(3)	ND(10)	NA*	NA*	10
TSP-8	6/13/2011	Total Recoverable	ug/L	1.2	**1.7**	0.28	24.2	2130	1.8	13.6	0.0208	ND(0.5)	**22.3**
TSP-9	4/30/2001	Dissolved	ug/L	NA*	**ND(5)**	ND(1)	10	NA*	ND(10)	**30**	NA*	NA*	**30**
TSP-9	6/7/2001	Dissolved	ug/L	ND(50)	**ND(3)**	ND(0.1)	4	340	ND(3)	**20**	NA*	ND(3)	**20**
TSP-9	7/18/2001	Dissolved	ug/L	ND(50)	**ND(3)**	0.6	5	250	ND(3)	**270**	NA*	ND(3)	ND(10)
TSP-9	4/23/2004	Dissolved	ug/L	NA*	**ND(3)**	ND(0.1)	ND(1)	350	4	**20**	NA*	NA*	**30**
TSP-9	5/31/2005	Dissolved	ug/L	NA*	**ND(3)**	0.2	4	140	ND(3)	ND(10)	NA*	NA*	ND(10)
TSP-9	5/29/2009	Total	ug/L	NA*	**ND(3)**	2.1	17	2760	ND(3)	**70**	NA*	NA*	**30**
TSP-9	6/13/2011	Total Recoverable	ug/L	0.57	**1.7**	0.25	8.9	2780	1.5	**18.8**	0.0199	ND(0.5)	**19**
TSP-10	4/30/2001	Total	ug/L	NA*	**ND(5)**	ND(1)	ND(10)	NA*	ND(10)	**60**	NA*	NA*	**40**
TSP-10	5/19/2011	Total Recoverable	ug/L	NA*	**2**	0.08	6.3	2990	2.7	**52.6**	NA*	NA*	17.1

[a] MT DEQ Risk Based Cleanup Guidelines (RBCG) Composite, Conservative Water Cleanup Guidelines for Recreational Visitors Table 7-11 (DEQ 1996)

[b] Carcinogenic risk of 5E-07

[c] For samples where both dissolved and total metals analysis were performed, the result shown is for the total metals analysis.

[d] Prior to the 2011 RI TSP-3 had only been sampled for flow rate

[e] Sample location 013 corresponds to sample location TSP-6

Bold values exceed DEQ RBCG values

Shading indicates relative concentrations values, dark represents higher relative concentrations

J, JB, and UJ qualifiers not shown, refer to Table 3-14 for qualifiers on 2011 data

ug/L = micrograms per liter

NA* - Not Applicable or not analyzed

ND() - Analyte was not detected (reporting limit)

NS - A standard has not been adopted

TABLE 3-19. SOLID-MATRIX ANALYTICAL RESULTS - TOTAL RECOVERABLE METALS
HISTORIC MINE AOC
BLACK PINE MINE

Location	Date Sampled	Sample Start Depth (ft)	Sample End Depth (ft)	Units	Antimony	Arsenic	Barium	Cadmium	Chromium	Cobalt	Copper	Lead	Manganese	Mercury	Nickel	Zinc	Iron	Silver
Risk Based Cleanup Guidelines[a] (mg/kg)					**293**	**40.4[bc]**	**4,975**	**19.5[b]**	**735,000**	**30,500**	**27,100**	**1,100**	**665**	**220**	**14,650**	**220,000**	**NS**	**NS**
HM-RS-01	7/13/2011	8	10	mg/kg	1.2	7.9	126	0.36	9.9	7.0	71.5	8.6	119	0.077 J	13.6	47.9	19800	ND(0.48)
HM-RS-01	7/13/2011	16	17	mg/kg	1.1	6.1	127	ND(0.073)	13.1	9.5	12.1	9.6	211	0.046	15.3	31.4	21100	ND(0.45)
HM-RS-02	7/13/2011	1	3	mg/kg	**421**	**376**	149	7.1	2.7	4.7	1010	**1820**	**740**	ND(0.021) UJ	6.7	71.2	15900	104
HM-RS-02	7/13/2011	3	5	mg/kg	2.7	11.0	147	0.23	8.5	9.6	23.2	34.8	620	3.5 J	11.2	46.6	16500	ND(0.42)
HM-RS-03	7/13/2011	1	3	mg/kg	**1140**	**894**	364	10.8	ND(0.45)	0.77	925	**2800**	219	1.2 J	1.5	140	24000	82.2
HM-SS-03	7/13/2011	3	5	mg/kg	25.8	**143**	132	1.3	8.1	7.2	547	339	352	0.86 J	9.4	85.6	15000	3.3
HM-RS-04	7/13/2011	7	9	mg/kg	39.1	**43.9**	160	0.88	8.7	16.4	358	216	497	0.34 J	14.1	50.6	19600	6.5
HM-SS-04	7/13/2011	10	12	mg/kg	2.2	7.2	182	ND(0.073)	21.4	8.9	12.9	13.5	400	0.040 J	18.3	36.1	23700	0.57
HM-RS-05	7/13/2011	2	4	mg/kg	50.3	**61.3**	153	1.2	8.9	9.9 J	193	401	465	0.094 J	13.7	ND(104)	11700	7.8
HM-RS-05	7/13/2011	5	7	mg/kg	18.1	22.4	77.8	0.91	7.7	5.3 J	57.9	149	197	0.059 J	8.5	26.2	9340	3.7
HM-RS-06	7/13/2011	1	3	mg/kg	**1020**	**1190**	261	**22.8**	4.1	2.8 J	3310	**4980**	**682**	0.56 J	ND(9.9)	395	28900	175
HM-RS-06	7/13/2011	8	10	mg/kg	188	**209**	155	4.0	12.2	9.8 J	441	**1500**	282	0.040 J	14.9	ND(100)	21000	22.1
HM-RS-07	7/13/2011	1	3	mg/kg	**1380**	**1380**	247	**20.6**	2.7	1.1 J	1280	**6960**	270	7.0 J	ND(2.8)	332	23100	319
HM-SS-07	7/13/2011	3	5	mg/kg	142	**154**	433	5.9	7.0	6.8 J	3440	1020	**2320**	8.5 J	10.9	124	12300	26.5
HM-RS-08	7/13/2011	2	4	mg/kg	27.6	**41.5**	92.9	1.7	12.3	8.5 J	329	614	412	0.57 J	9.9	191	12500	3.6
HM-SS-09	7/13/2011	0	0.5	mg/kg	20.6	33.8	179	2.2	9.5	7.2	1390	375	**782**	0.57 J	10.4	136	13000	5
HM-SS-10	7/13/2011	0	0.5	mg/kg	5.0	8.6	241	1.6	10.9	10.9	2080	99.6	**1400**	0.029 J	10.7	122	13800	ND(0.58)
HM-SS-11	7/13/2011	0	0.5	mg/kg	31.4	**57.8**	93.9	0.70	4.6	2.0	283	267	254	0.89 J	3.9	32.0	6140	6.7
HM-SS-12	7/13/2011	0	0.5	mg/kg	8.1	14.9	178	0.92	7.4	4.6	389	62.9	463	0.024 J	8.8	69.3	9390	1.6
HM-SS-13	7/14/2011	0	0.5	mg/kg	254	**316**	305	6.6	7.2	4.3	1420	**2210**	**1240**	1.0 J	9.2	181	15700	42.2
HM-SS-14	7/14/2011	0	0.5	mg/kg	149	**141**	254	2.3	6.5	2.8	662	857	461	0.26 J	10.4	135	12800	30.5
HM-SS-15	7/13/2011	0	0.5	mg/kg	**594**	**501**	218	7.3	3.1	0.63 J	505	**2050**	46.5	3.6 J	2.0	326	27400	144
HM-SS-16	7/14/2011	0	0.5	mg/kg	**1160**	**1140**	228	11.4	2.3	0.43	1530	**4900**	64.8	13.0 J	1.1	297	53600	140
HM-SD-01	6/13/2011	0	0.5	mg/kg	20.0	24.8	752	4.9 J	20.7	9.8 J	2780	305	**2780**	27.4	26.8	272	21400	3.4 J

[a] MT DEQ Risk Based Cleanup Guidelines (RBCG) Composite, Conservative Soil Cleanup Guidelines for Recreational Visitors Table 7-10 (DEQ 1996)

[b] Carcinogenic risk of 5E-07

[c] UCL = 95th upper confidence limit on the arithmetic mean background concentration, from background samples

Bold, highlighted values exceed DEQ RBCG values

J – Estimated concentration

UJ – Estimated reporting limit

ft - feet

mg/kg - milligrams per kilogram.

ND() - Analyte was not detected (reporting limit)

NS - A standard has not been adopted

TABLE 3-20. ACID BASE ACCOUNTING RESULTS
HISTORIC MINE AOC
BLACK PINE MINE

Location	Date Sampled	Sample Start Depth (ft)	Sample End Depth (ft)	Acid Base Potential** (t/1000t)	Acid Potential (t/1000t)	Neutralization Potential (t/1000t)	pH, SMP Buffer (Standard Units)	Recommended Lime (t/1000t)	SMP Lime Requirement (t/1000t)	Sulfur (HCL Extraction) (%)	Sulfur (HNO3 Extraction) (%)	Sulfur (Hot Water Extraction) (%)	Sulfur, Residual (%)	Sulfur, Total (%)
HM-RS-01	7/13/2011	8	10	0.74	ND(4.3)	0.74	6.7	ND(5.4)	1.8	ND(0.05)	ND(0.05)	ND(0.05)	ND(0.05)	ND(0.05)
HM-RS-02	7/13/2011	1	3	1.7	ND(4.3)	1.7	6.2	7.3	5.3	ND(0.05)	ND(0.05)	ND(0.05)	ND(0.05)	0.0529
HM-RS-03	7/13/2011	1	3	1.5	ND(4.3)	1.5	6.6	6.3	2.4	ND(0.05)	ND(0.05)	0.131	ND(0.05)	0.228
HM-RS-04	7/13/2011	7	9	3.2	ND(4.3)	3.2	6.6	ND(5.4)	2.4	ND(0.05)	ND(0.05)	ND(0.05)	ND(0.05)	ND(0.05)
HM-RS-05	7/13/2011	2	4	0.73	ND(4.3)	0.73	6.9	ND(5.4)	0.3	ND(0.05)	ND(0.05)	ND(0.05)	ND(0.05)	ND(0.05)
HM-RS-06	7/13/2011	1	3	0	ND(4.3)	ND(0.5)	6.9	ND(5.4)	0.3	ND(0.05)	ND(0.05)	0.0542	ND(0.05)	0.0912
HM-RS-07	7/13/2011	1	3	0	ND(4.3)	ND(0.5)	6.3	11	4.6	0.0937	0.0559	0.183	ND(0.05)	0.339
HM-RS-08	7/13/2011	2	4	6	ND(4.3)	6	6.8	ND(5.4)	1	ND(0.05)	ND(0.05)	ND(0.05)	ND(0.05)	ND(0.05)
HM-SS-09	7/13/2011	0	0.5	0	ND(4.3)	ND(0.5)	6	7.9	6	ND(0.05)	ND(0.05)	ND(0.05)	ND(0.05)	ND(0.05)
HM-SS-10	7/13/2011	0	0.5	0	ND(4.3)	ND(0.5)	6.4	ND(5.4)	3.9	ND(0.05)	ND(0.05)	ND(0.05)	ND(0.05)	ND(0.05)
HM-SS-11	7/13/2011	0	0.5	0	ND(4.3)	ND(0.5)	6.2	7.7	5.3	ND(0.05)	ND(0.05)	ND(0.05)	ND(0.05)	ND(0.05)
HM-SS-12	7/13/2011	0	0.5	0	ND(4.3)	ND(0.5)	6.5	ND(5.4)	3.1	ND(0.05)	ND(0.05)	ND(0.05)	ND(0.05)	ND(0.05)
HM-SS-13	7/14/2011	0	0.5	2.9	ND(4.3)	2.9	6.6	ND(5.4)	2.4	ND(0.05)	ND(0.05)	ND(0.05)	ND(0.05)	ND(0.05)
HM-SS-14	7/14/2011	0	0.5	0	ND(4.3)	ND(0.5)	6.5	ND(5.4)	3.1	ND(0.05)	ND(0.05)	ND(0.05)	ND(0.05)	ND(0.05)
HM-SS-15	7/13/2011	0	0.5	-7.5	7.5	ND(0.5)	6.5	13	3.1	0.0746	0.175	ND(0.05)	ND(0.05)	0.183
HM-SS-16	7/14/2011	0	0.5	-8.2	8.2	ND(0.5)	6.2	16.9	5.3	ND(0.05)	0.255	0.312	ND(0.05)	0.452

ft - feet

t/1000t = tons of Calcium Carbonate ($CaCO_3$) per 1,000 tons waste

ND() - Analyte was not detected (reporting limit)

** Acid/Base Potential = NP - AP

Potentially Acid Generating:

Uncertain Acid Generation Potential:

Unlikely to Generate Acid:

NP:AP < 1 and NNP < -20 tons/kton

NP:AP between 1 and 3 and/or NNP between -20 and +20 tons/kton

NNP < +20 tons/kton

NP = Neutralization Potential

AP = Acid Potential

NNP = Net Neutralizing Potential = Base - Acid Potential

TABLE 3-21. SURFACE WATER ANALYTICAL RESULTS - TOTAL RECOVERABLE METALS
DEQ RISK BASED CLEANUP GUIDELINES
HISTORIC MINE AOC
BLACK PINE MINE

Location	Date Sampled	Discharge (cfs)	Units	Antimony	Arsenic	Barium	Cadmium	Chromium	Copper	Iron	Lead	Manganese	Mercury	Nickel	Silver	Zinc
MCSP-1	6/13/2011	0.39	ug/L	1.4	**1.6**	65.7	0.26	1.5	107	1080 J	2.9 JB	15.4	0.045	2.3	ND(0.5)	**31.4**
Road Cut	5/19/2011	NA*	ug/L	NA*	**3.3**	NA*	ND(0.080)	NA*	16.8 J	1810 J	5.3	16.0	NA*	NA*	NA*	9.2 J
Risk Based Cleanup Guidelines[a] (ug/L)				**91.1**	**0.06[b]**	**17,474**	**66.5**	**100,246**	**472**	**4,979**	**47.1**	**16.6**	**0.15**	**931**	**NS**	**17.2**

[a] MT DEQ Risk Based Cleanup Guidelines (RBCG) Composite, Conservative Water Cleanup Guidelines for Recreational Visitors Table 7-11 (DEQ 1996)

[b] Carcinogenic risk of 5E-07

Bold, highlighted values exceed DEQ RBCG values

J – Estimated concentration

JB – Estimated concentration due to blank contamination

cfs - cubic feet per second

ug/L = micrograms per liter

NA* - Not applicable or not analyzed

ND() - Analyte was not detected (reporting limit)

NS - A standard has not been adopted

TABLE 3-22. SURFACE WATER ANALYTICAL RESULTS - TOTAL RECOVERABLE METALS
CIRCULAR DEQ-7 STANDARDS
HISTORIC MINE AOC
BLACK PINE MINE

HUMAN HEALTH STANDARDS (HHS)

Location	Date Sampled	Discharge (cfs)	Units	Antimony	Arsenic	Barium	Cadmium	Chromium	Copper	Iron	Lead	Manganese	Mercury	Nickel	Silver	Zinc
Circular DEQ-7 HHS[a] (ug/L)				**5.6[d]**	**10[e]**	**1,000[i]**	**5[e]**	**100[e]**	**1,300[d]**	**300[f]**	**15[d]**	**50[f]**	**0.05[d]**	**100[g]**	**100[g]**	**2,000[g]**
MCSP-1	6/13/2011	0.39	ug/L	1.4	1.6	65.7	0.26	1.5	107	**1080 J**	2.9 JB	15.4	0.045	2.3	ND(0.50)	31.4
Road Cut	5/19/2011	NA*	ug/L	NA*	3.3	NA*	ND(0.080)	NA*	16.8 J	**1810 J**	5.3	16.0	NA*	NA*	NA*	9.2 J

FRESHWATER ACUTE AQUATIC LIFE STANDARDS (AALS)

Location	Date Sampled	Discharge (cfs)	Units	Antimony	Arsenic	Barium	Cadmium	Chromium	Copper	Iron	Lead	Manganese	Mercury	Nickel	Silver	Zinc
Circular DEQ-7 AALS[b] (ug/L)				**NS**	**340[d]**	**NS**	**0.52[d,h]**	**579[d,h]**	**3.79[d,h]**	**NS**	**13.98[d,h]**	**NS**	**1.7[d]**	**145[d,h]**	**0.374[d,h]**	**37[d,h]**
MCSP-1	6/13/2011	0.39	ug/L	1.4	1.6	65.7	0.26	1.5	**107**	1080 J	2.9 JB	15.4	0.045	2.3	**ND(0.50)**	31.4
Road Cut	5/19/2011	NA*	ug/L	NA*	3.3	NA*	ND(0.080)	NA*	**16.8 J**	1810 J	5.3	16.0	NA*	NA*	NA*	9.2 J

FRESHWATER CHRONIC AQUATIC LIFE STANDARDS (CALS)

Location	Date Sampled	Discharge (cfs)	Units	Antimony	Arsenic	Barium	Cadmium	Chromium	Copper	Iron	Lead	Manganese	Mercury	Nickel	Silver	Zinc
Circular DEQ-7 CALS[c] (ug/L)				**NS**	**150[d]**	**NS**	**0.097[d,h]**	**27.7[d,h]**	**2.85[d,h]**	**1,000[i]**	**0.545[d,h]**	**NS**	**0.91[d]**	**16.1[d,h]**	**NS**	**37[d,h]**
MCSP-1	6/13/2011	0.39	ug/L	1.4	1.6	65.7	**0.26**	1.5	**107**	**1080 J**	**2.9 JB**	15.4	0.045	2.3	ND(0.50)	31.4
Road Cut	5/19/2011	NA*	ug/L	NA*	3.3	NA*	ND(0.080)	NA*	**16.8 J**	**1810 J**	**5.3**	16.0	NA*	NA*	NA*	9.2 J

[a] Human Health Standards (HHS) for Water, Circular DEQ-7, Montana Numeric Water Quality Standards (DEQ 2010)
[b] Freshwater Acute Aquatic Life Standards (AALS), Circular DEQ-7, Montana Numeric Water Quality Standards (DEQ 2010)
[c] Freshwater Chronic Aquatic Life Standards (CALS), Circular DEQ-7, Montana Numeric Water Quality Standards (DEQ 2010)
[d] Priority Pollutant, Circular DEQ-7, Montana Numeric Water Quality Standards (DEQ 2010)
[e] Maximum Contaminant Level, Circular DEQ-7, Montana Numeric Water Quality Standards (DEQ 2010)
[f] Secondary Maximum Contaminant Level based on aesthetic properties, Circular DEQ-7, Montana Numeric Water Quality Standards (DEQ 2010)
[g] Health Advisory, Circular DEQ-7, Montana Numeric Water Quality Standards (DEQ 2010)
[h] @ 25 mg/L hardness, Circular DEQ-7, Montana Numeric Water Quality Standards (DEQ 2010)
[i] Non-Priority Pollutant, Circular DEQ-7, Montana Numeric Water Quality Standards (DEQ 2010)

Bold, highlighted values exceed respective standards

J – Estimated concentration
JB – Estimated concentration due to blank contamination
cfs - cubic feet per second
ug/L = micrograms per liter
NA* - Not applicable or not analyzed
ND() - Analyte was not detected (reporting limit)
NS - A standard has not been adopted

TABLE 3-23. HISTORICAL SURFACE WATER ANALYTICAL RESULTS - METALS
HISTORIC MINE AOC
BLACK PINE MINE

Location	Date Sampled	Metals Analysis[c]	Units	Antimony	Arsenic	Cadmium	Copper	Iron	Lead	Manganese	Mercury	Silver	Zinc
BPM-Seep	5/6/1998	Total	ug/L	4	**2**	ND(0.2)	11	250	ND(1)	ND(5)	NA*	ND(1)	ND(5)
MCSP-1	6/7/2001	Dissolved	ug/L	ND(50)	**ND(3)**	0.1	3	170	ND(3)	ND(10)	NA*	ND(3)	10
MCSP-1	7/18/2001	Dissolved	ug/L	ND(50)	**ND(3)**	2	3	80	ND(3)	ND(10)	NA*	ND(3)	ND(10)
MCSP-1	4/23/2004	Dissolved	ug/L	NA*	**ND(3)**	ND(0.1)	ND(1)	ND(30)	ND(3)	ND(10)	NA*	NA*	ND(10)
MCSP-1	5/31/2005	Dissolved	ug/L	NA*	**ND(3)**	ND(0.1)	4	ND(30)	ND(3)	ND(10)	NA*	NA*	ND(10)
MCSP-1	6/13/2011	Total Recoverable	ug/L	1.4	**1.6**	0.26	107	1080	2.9	15.4	0.045	ND(0.5)	**31.4**
Road cut	5/19/2011	Total Recoverable	ug/L	NA*	**3.3**	ND(0.08)	16.8	1810	5.3	16	NA*	NA*	9.2

[a] MT DEQ Risk Based Cleanup Guidelines (RBCG) Composite, Conservative Water Cleanup Guidelines for Recreational Visitors Table 7-11 (DEQ 1996)

[b] Carcinogenic risk of 5E-07

[c] For samples where both dissolved and total metals analysis were performed, the result shown is for the total metals analysis.

Bold values exceed DEQ RBCG values

Shading indicates relative concentrations values, dark represents higher relative concentrations

J and JB qualifiers not shown, refer to Table 3-19 for qualifiers on 2011 data

ug/L = micrograms per liter

NA* - Not Applicable or not analyzed

ND() - Analyte was not detected (reporting limit)

NS - A standard has not been adopted

TABLE 3-24. SOLID-MATRIX ANALYTICAL RESULTS - TOTAL RECOVERABLE METALS
COMBINATION MILL AOC
BLACK PINE MINE

Location	Date Sampled	Sample Start Depth (ft)	Sample End Depth (ft)	Units	Antimony	Arsenic	Barium	Cadmium	Chromium	Cobalt	Copper	Lead	Manganese	Mercury	Nickel	Zinc	Iron	Silver
Risk Based Cleanup Guidelines[a] (mg/kg)					**293.0**	**40.4[bc]**	**4,975**	**19.5[b]**	**735,000**	**30,500**	**27,100**	**1,100**	**665.0**	**220.0**	**14,650**	**220,000**	**NS**	**NS**
CML-SD-01	6/14/2011	0	0.5	mg/kg	**317**	**223**	74.5	4.8	6.2	7.6 J	378	826	413	17.6	3.9	188	14400	11.2
CML-SD-02	6/15/2011	0	0.5	mg/kg	**461**	**417**	308	8.9	8.4	10.9 J	1430	**1970**	**744**	13.6	6.9	317	22700	25.6
CML-SD-03	6/15/2011	0	0.5	mg/kg	16.8	19.4	143	0.43	20.7	7.6 J	57.9	207	404	4.1	9.1	40.5	22300	1.6
CML-SD-04	6/14/2011	0	0.5	mg/kg	16.7	27.9	335	1.4	8.3	19.3 J	109	74.2	**1980**	14.4	11.4	144	12400	2.2
CML-SD-05	6/14/2011	0	0.5	mg/kg	ND(0.64)	12.0	452	1.2	11.8	8.1 J	26.8	16.3	**1160**	0.38	13.4	96.8	14500	ND(0.64)
CML-SD-06	6/13/2011	0	0.5	mg/kg	**891**	**642**	353	**28.6 J**	8.2	7.6 J	3620	**3760**	602	32.8	14.6	768	21200	64.6 J
CML-SD-07	6/14/2011	0	0.5	mg/kg	**817**	**596**	340	15.4	8.3	10.4 J	5320	**4240**	**1180**	10.1	6.1	393	21800	37.6
CML-SD-08	6/14/2011	0	0.5	mg/kg	**613**	**553**	244	11.5	5.6	6.7 J	1390	**2960**	443	12.1	5.8	430	20100	34.8
CML-SD-09	6/14/2011	0	0.5	mg/kg	**465**	**377**	163	7.8	5.4	7.8 J	920	**2070**	452	5.4	5.2	287	15400	23.9
CML-SD-10	6/14/2011	0	0.5	mg/kg	**596**	**492**	185	10.3	5.2	6.2 J	1160	**2460**	419	7.0	4.9	401	19700	38.2
CML-SD-11	6/14/2011	0	0.5	mg/kg	**307**	**219**	145	4.6	6.1	11.5 J	623	**1170**	**1210**	21.1	6.5	248	16300	14.8
CML-SD-13	6/16/2011	0	0.5	mg/kg	**440**	**339**	229	7.7	7.5	12.7	1210	**1690**	**741**	17.4	6.9	257	17300	23.1
CML-SD-14	6/16/2011	0	0.5	mg/kg	**1010**	**668**	304	14.7	4.9	3.6	2230	**3270**	257	7.7	3.2	403	21700	51.5
CML-SD-15	6/16/2011	0	0.5	mg/kg	**1300**	**1250**	1030	**32.5**	6.5	1.9	4810	**8050**	342	9.2	4.1	1300	35900	213
CML-SD-16	6/16/2011	0	0.5	mg/kg	**2130**	**1670**	492	**26.6**	2.0	0.66	5170	**7330**	171	8.0	0.69	313	27700	73.1
CML-SD-17	6/16/2011	0	0.5	mg/kg	**1090**	**745**	317	17.1	3.8	3.1	1910	**3880**	325	10.5	2.5	496	23800	56.1
CML-SD-18	7/13/2011	0	0.5	mg/kg	76.1 J	**211 J**	793 J	14.8	18.5	16.3	1070 J	663 J	**1640**	11.6	24.1	479 J	29700	16.6
CML-SD-19	7/13/2011	0	0.5	mg/kg	**614 J**	**442 J**	238 J	15.4	ND(2.8)	ND(2.8)	727 J	**2560 J**	264	2.8	ND(5.5)	238 J	11900	47
CML-SD-19	7/13/2011	2	3	mg/kg	21.1 J	**43.6 J**	317 J	6.8	16.8	19.6	361 J	197 J	**920**	3.4	19.5	339 J	26900	2.7
CML-SD-20	7/12/2011	0	0.5	mg/kg	**528 J**	**617 J**	430 J	**25.9**	7.8	8.6	2430 J	**3720 J**	**1280**	8.6	ND(6.8)	335 J	19400	50.7
CML-SD-20	7/12/2011	2	3	mg/kg	6.3 J	29.7 J	396 J	6.6	15.5	21.3	136 J	86.1 J	**1040**	7.0	23.2	231 J	27800	ND(2.8)
CML-SD-21	7/12/2011	0	0.5	mg/kg	**475 J**	**507 J**	292 J	**22.5**	5.6	5.0	1630 J	**2940 J**	474	6.3	6.3	413 J	19200	43.6
CML-SD-22	7/13/2011	0	0.5	mg/kg	28.5 J	**58.2 J**	153 J	2.1	12.2	9.9	154 J	186 J	610	1.6	7.7	118 J	22800	ND(2.6)
CML-SD-23	7/13/2011	0	0.5	mg/kg	40.9 J	**61.6 J**	190 J	2.4	22.1	11.6	249 J	282 J	568	5.8	10.5	92.4 J	31600	ND(2.3)
CML-SD-23	7/13/2011	2	3	mg/kg	38.0 J	**48.4 J**	218 J	3.1	21.6	13.0	661 J	300 J	**789**	2.9	10.5	108 J	30800	ND(2.2)
CML-SD-24	7/12/2011	0	0.5	mg/kg	95.0 J	**109**	371	6.5	10.0	15.3	500	617 J	**1190**	4.9	10.4	269 J	16500	7.3
CML-SD-24	7/12/2011	1	2	mg/kg	24.0 J	30.5 J	425 J	13.8	16.3	25.8	1390 J	182 J	**2050**	5.6	22.5	328 J	23200	ND(2.9)
CML-SD-25	7/12/2011	0	0.5	mg/kg	184 J	**232 J**	515 J	12.6	12.1	12.9	837 J	**1210 J**	**1210**	3.5	13.3	326 J	19900	12.7
CML-SD-26	7/12/2011	0	0.5	mg/kg	**312 J**	**291 J**	185 J	12.3	5.0	6.5	654 J	**1870 J**	598	4.5	ND(5.7)	235 J	13600	22.7
CML-SD-27	7/12/2011	0	0.5	mg/kg	172 J	**176**	185	8.0	6.6	8.0	1130	1050 J	**790**	10.4	6.2	175 J	14100	14.2
CML-SD-28	7/12/2011	0	0.5	mg/kg	248 J	**265**	647	15.9	14.8	17.2	1690	**1440 J**	**1070**	22.1	18.3	343 J	23500	14.7
CML-SD-29	7/12/2011	0	0.5	mg/kg	**706 J**	**630**	359	**27.6**	3.7	3.1	2060	**3890 J**	352	4.1	ND(4.9)	359 J	17300	58.1
CML-SD-30	7/13/2011	0	0.5	mg/kg	5.6 J	24.9 J	294 J	6.6	15.1	23.7	1550 J	81.8 J	**974**	9.6	12.9	232 J	26500	ND(2.5)
CML-SD-31	7/12/2011	0	0.5	mg/kg	272 J	**301**	451	13.5	11.7	15.5	2950	**1350 J**	**1040**	2.1	9.5	370 J	22600	19.3
CML-SD-31	7/12/2011	2	3	mg/kg	**406 J**	**382**	296	17.9	8.3	18.8	1950	**2350 J**	**1190**	3.8	10.4	246 J	18900	39.2
CML-SD-32	7/12/2011	0	0.5	mg/kg	**463 J**	**449**	421	16.0	7.9	5.2	921	**2470 J**	558	10.9	7.2	387 J	19300	21.6
CML-SD-33	7/12/2011	0	0.5	mg/kg	159 J	**155**	448	9.0	11.4	3.5	1260	925 J	127	4.3	7.2	200 J	13400	11.1
CML-SD-33	7/12/2011	1	2	mg/kg	**511 J**	**527**	210	**20.6**	3.1	ND(2.3)	1420	**2940 J**	163	1.1	ND(4.7)	260 J	14200	46.6
CML-SD-34	7/12/2011	0	0.5	mg/kg	**683 J**	**315**	269	15.6	13.6	6.9	2240	**2840 J**	165	55.4	ND(11.9)	333 J	18800	29.6
CML-SD-35	7/12/2011	0	0.5	mg/kg	**293 J**	**305**	271	12.9	9.8	5.4	1740	**2200 J**	**666**	57.9	7.5	344 J	22100	31.3
CML-SD-36	7/12/2011	0	0.5	mg/kg	105 J	**125**	259	6.2	5.5	4.2	479	769 J	**788**	9.3	6.5	107 J	9620	18.8
CML-SD-37	7/12/2011	0	0.5	mg/kg	88.9 J	**118**	249	4.4	25.8	9.9	276	693 J	569	8.1	4.7	164 J	36900	10.8
CML-SD-38	7/12/2011	0	0.5	mg/kg	69.3 J	**101**	284	4.4	10.3	6.2	375	518 J	**1300**	9.7	7.1	134 J	16400	8.3
CML-SD-39	7/13/2011	0	0.5	mg/kg	23.0 J	27.2 J	414 J	2.2	10.2	6.6	180 J	238 J	415	5.3	12.1	101 J	11900	ND(2.2)
CML-SD-40	7/12/2011	0	0.5	mg/kg	11.1 J	16.5	437	1.6	10.3	7.6	75.5	88.0 J	**781**	2.1	13.9	127 J	11300	ND(3)
CML-SD-41	7/12/2011	0	0.5	mg/kg	239 J	**270**	191	13.1	8.9	3.4	653	**1570 J**	485	5.4	ND(5.0)	170 J	24900	46.3
CML-SD-42	7/13/2011	0	0.5	mg/kg	26.2 J	37.4 J	63.2 J	1.1	9.5	3.5	123 J	174 J	88.4	3.9	ND(4.4)	32.6 J	14800	ND(2.2)
CML-SD-42	7/13/2011	2	3	mg/kg	40.5 J	**48.7 J**	171 J	2.4	11.6	5.7	309 J	240 J	323	5.0	9.0	71.9 J	15400	2.7

TABLE 3-24. SOLID-MATRIX ANALYTICAL RESULTS - TOTAL RECOVERABLE METALS
COMBINATION MILL AOC
BLACK PINE MINE

Location	Date Sampled	Sample Start Depth (ft)	Sample End Depth (ft)	Units	Antimony	Arsenic	Barium	Cadmium	Chromium	Cobalt	Copper	Lead	Manganese	Mercury	Nickel	Zinc	Iron	Silver
Risk Based Cleanup Guidelines[a] (mg/kg)					**293.0**	**40.4[bc]**	**4,975**	**19.5[b]**	**735,000**	**30,500**	**27,100**	**1,100**	**665.0**	**220.0**	**14,650**	**220,000**	**NS**	**NS**
CML-SD-43	7/12/2011	0	0.5	mg/kg	20.0 J	32.9	485	4.2	10.9	8.3	131	136 J	**936**	3.3	12.7	211 J	13100	ND(3.1)
CML-SD-44	7/12/2011	0	0.5	mg/kg	7.9 J	29.5	437	1.3	23.9	7.8	97.9	168 J	160	6.9	19.2	202 J	37400	ND(3.3)
CML-SD-45	7/12/2011	0	0.5	mg/kg	2.8 J	7.8	285	1.1	8.4	7.7	42.5	37.5 J	**739**	1.1	11.0	78.3 J	9690	ND(2.5)
CML-SD-46	7/12/2011	0	0.5	mg/kg	8.0 J	10.5	489	1.5	24.2	6.4	68.9	55.0 J	183	12.7	25.4	227 J	25900	ND(4.9)
CML-TS-01	7/15/2011	0	1	mg/kg	**324**	**262**	240	8.9	3.3	7.6	1680	**2300**	620	0.24 J	5.7	198	16900	26.5
CML-TS-01	7/15/2011	2	4	mg/kg	23.3	24.2	483	8.7	15.0	8.0	2140	144	269	1.0 J	13.3	213	13300	1.3
CML-SS-01	7/15/2011	6	7	mg/kg	167	**123**	229	8.3	5.7	15.3	2570	**1120**	**1300**	0.35 J	6.8	163	12800	14.1
CML-TS-02	7/15/2011	0	1	mg/kg	6.9	11.2	34.7	0.84	2.3	7.5	846	32.3	147	0.30 J	4.5	60.6	7930	0.52
CML-TS-02	7/15/2011	2	4	mg/kg	7.5	11.3	365	2.3	10.1	12.8	92.0	44.9	297	1.9	13.9	159	9680	1.1
CML-SS-02	7/15/2011	6	7	mg/kg	10	11.9	178	3.1	6.1	2.1	2360	67.7	67.2	9.1	5.3	108	5640	1
CML-TS-03	7/15/2011	0	1	mg/kg	**1370**	**1640**	514	**31.8**	ND(0.60)	1.9	5420	837	327	9.9	1.6	522	25100	142
CML-TS-03	7/15/2011	2	4	mg/kg	**1730**	**1610**	471	**23.7**	ND(0.55)	ND(0.55)	6240	**9390**	167	5.5	0.69	735	29300	110
CML-SS-03	7/15/2011	6	7	mg/kg	**750**	**777**	370	15.0	ND(0.50)	2.5	3840	**5310**	136	12.6	4.1	384	16200	70.8
CML-TS-04	7/15/2011	0	1	mg/kg	**548**	**390**	434	17.3	9.8	2.2 J	3240	**2460**	143	0.24 J	6.0	278	17500	48.7
CML-TS-04	7/15/2011	2	4	mg/kg	52.2	**50.6**	289	7.1	11.8	8.4 J	846	181	298	13.1 J	8.5	139	19000	4.2
CML-SS-04	7/15/2011	6	8	mg/kg	164	**121**	286	9.6	9.5	11.4 J	1230	393	359	81.1 J	9.2	208	10700	10.1
CML-TS-05	7/15/2011	0	1	mg/kg	**409**	**353**	421	13.6	11.5	7.8 J	2020	**1840**	418	0.80 J	8.2	311	17300	28.4
CML-TS-05	7/15/2011	2	4	mg/kg	**1190**	**1020**	615	**21.0**	4.9	1.1 J	3690	**10000**	172	2.5 J	2.7	654	20600	79.9
CML-SS-05	7/15/2011	4	6	mg/kg	**1260**	**1030**	495	**23.1**	4.8	1.3 J	5600	**8010**	155	24.7 J	3.0	371	18900	101
CML-TS-06	7/15/2011	0	1	mg/kg	**1040**	**830**	463	**30.7**	5.8	2.0 J	1740	**6790**	190	0.40 J	4.1	220	15600	128
CML-TS-06	7/15/2011	2	4	mg/kg	**1410**	**1070**	397	**22.0**	4.1	1.3 J	4040	**6960**	246	46.1 J	2.4	334	22600	99.9
CML-SS-06	7/15/2011	5	7	mg/kg	19.2	**176**	427	**63.1**	22.6	4.4 J	367	77.1	165	79.3 J	19.9	576	14600	3.7
CML-TS-07	7/15/2011	0	1	mg/kg	**529**	**496**	289	7.5 J	3.7 J	4.3 J	1110	**2650**	315	215 J	9.3	250	27600	52.5
CML-TS-07	7/15/2011	2	4	mg/kg	**690**	**633**	207	12.5 J	ND(0.52) UJ	0.93 J	941	**3290**	289	**221 J**	1.6	334	15500	96.2
CML-SS-07	7/15/2011	5	7	mg/kg	30.3	39.5	151	1.5 J	5.2 J	43.1 J	231	167	**1600**	67.5 J	8.0	80.7	22400	2.4
CML-TS-08	7/15/2011	0	1	mg/kg	233	**188**	146	4.3 J	2.8 J	2.3 J	687	**1290**	183	10.8 J	3.4	118	16000	20.8
CML-TS-08	7/15/2011	5	7	mg/kg	**360**	**340**	337	8.2 J	ND(0.52) UJ	4.2 J	1610	**2990**	**1120**	7.4 J	3.7	194	26600	113
CML-SS-08	7/15/2011	7	9	mg/kg	1.9	8.3	156	0.12 J	5.4 J	14.4 J	35.1	20.1	457	130 J	7.0	178	18800	7.1
CML-TS-09	7/15/2011	0	1	mg/kg	**3210**	**2440**	424	**49.2 J**	ND(0.64) UJ	4.8 J	6630	**9520**	439	ND(0.024) UJ	6.2	1110	52500	168
CML-TS-09	7/15/2011	2	4	mg/kg	**1280**	**5140**	464	13.2 J	ND(0.49) UJ	2.5 J	3120	**23600**	84.4	0.64 J	3.6	122	60700	119
CML-TS-09	7/15/2011	4	6	mg/kg	**2540**	**4980**	315	**35.2 J**	ND(0.54) UJ	1.7 J	5580	**15100**	234	137 J	2.2	273	67700	108
CML-TS-09	7/15/2011	6	8	mg/kg	**15700**	**4200**	390	**99.9 J**	ND(0.56) UJ	14.6 J	22700	**12600**	**815**	4.1 J	20.7	1570	50700	159
CML-TS-10	7/15/2011	0	1	mg/kg	**1090**	**1250**	378	5.8	ND(0.50)	0.98	2160	**8010**	254	0.33 J	1.8	989	42900	62.3
CML-TS-10	7/15/2011	2	4	mg/kg	**1110**	**1400**	616	4.4	ND(0.48)	ND(0.48)	1340	**2490**	169	0.59 J	ND(0.48)	419	21600	10.5
CML-SS-10	7/15/2011	6	7	mg/kg	162	**173**	178	1.7	ND(0.45)	14.7	606	**1830**	**1050**	0.77 J	7.9	251	49500	9.5

[a] MT DEQ Risk Based Cleanup Guidelines (RBCG) Composite, Conservative Soil Cleanup Guidelines for Recreational Visitors Table 7-10 (DEQ 1996)

[b] Carcinogenic risk of 5E-07

[c] UCL = 95th upper confidence limit on the arithmetic mean background concentration, from background samples

Bold, highlighted values exceed DEQ RBCG values

J – Estimated concentration

UJ – Estimated reporting limit

ft - feet

mg/kg - milligrams per kilogram.

ND() - Analyte was not detected (reporting limit)

NS - A standard has not been adopted

TABLE 3-25. HISTORICAL SOLID-MATRIX ANALYTICAL RESULTS - METALS
COMBINATION MILL AOC
BLACK PINE MINE

Description	Location	Date Sampled	Metals Analysis	Sample Start Depth (ft)	Sample End Depth (ft)	Units	Antimony	Arsenic	Cadmium	Copper	Iron	Lead	Manganese	Mercury	Nickel	Silver	Zinc
Risk Based Cleanup Guidelines[b] (mg/kg)							**293.0**	**40.4[ce]**	**19.5[c]**	**27,100.0**	**NS**	**1,100.0**	**665.0**	**220.0**	**14,650.0**	**NS**	**220,000.0**
1991 Schafer Soil Samples[d]	88-1 B	8/27/1991	Total Metals	0.67	1.33	mg/kg	NA*	**187.0**	NA*	1,450	6,740	**1,940**	NA*	7.00	NA*	54.00	146.0
	88-10 A	8/28/1991	Total Metals	0	2	mg/kg	NA*	**1,150**	NA*	8,650	11,400	**20,500**	NA*	80.00	NA*	42.00	256.0
	88-11 A	8/28/1991	Total Metals	0	2	mg/kg	NA*	**548.0**	NA*	591.0	6,170	**5,480**	NA*	15.00	NA*	14.00	302.0
	88-3 B	8/27/1991	Total Metals	1.5	2	mg/kg	NA*	**445.0**	NA*	1,080	10,400	**3,180**	NA*	2.00	NA*	66.00	116.0
	88-4 A	8/27/1991	Total Metals	0	1	mg/kg	NA*	**613.0**	NA*	1,830	13,600	**4,860**	NA*	34.00	NA*	494.0	430.0
	88-5 A	8/27/1991	Total Metals	0.67	1.67	mg/kg	NA*	**469.0**	NA*	1,340	17,300	**4,640**	NA*	15.00	NA*	573.0	403.0
	88-6 A	8/28/1991	Total Metals	0	1	mg/kg	NA*	**733.0**	NA*	2,890	8,240	**8,150**	NA*	124.0	NA*	70.00	221.0
	88-7 A	8/28/1991	Total Metals	0	0.5	mg/kg	NA*	**457.0**	NA*	3,860	10,000	**5,220**	NA*	71.00	NA*	44.00	285.0
	88-8 B	8/29/1991	Total Metals	1.67	2.33	mg/kg	NA*	**1,090**	NA*	8,410	24,600	**21,300**	NA*	**393.0**	NA*	133.0	832.0
	88-9 A	8/28/1991	Total Metals	0.33	1.17	mg/kg	NA*	**260.0**	NA*	1,940	9,900	**2,440**	NA*	64.00	NA*	21.00	194.0
Average[a]						**mg/kg**	NA*	**595.2**	NA*	3,204	11,835	**7,771**	NA*	80.50	NA*	151.1	318.5
1990 ASARCO Soils Samples	BP-1	9/13/1990	Total Metals	NA*	NA*	mg/kg	NA*	ND(8)	**ND(0.8)**	63.50	7,282	53.90	**907.0**	2.45	NA*	ND(0.1)	91.40
	BP-2	9/13/1990	Total Metals	NA*	NA*	mg/kg	NA*	**212.0**	9.31	1,570	8,970	**1,580**	485.0	47.00	NA*	27.70	139.0
	BP-3	9/13/1990	Total Metals	NA*	NA*	mg/kg	NA*	**460.0**	13.10	1,580	12,550	**2,890**	386.0	60.00	NA*	36.20	344.0
Average[a]						**mg/kg**	NA*	**225.3**	7.60	1,071	9,601	**1,508**	592.7	36.48	NA*	21.32	191.5
1990 ASARCO Tailings	BP-Tailings	9/13/1990	Total Metals	NA*	NA*	mg/kg	NA*	**1,684**	**45.79**	5,084	18,070	**10,650**	168.4	**250.0**	NA*	87.80	520.0
1991 Schafer Sediment Samples	201	8/29/1991	Total Metals	NA*	NA*	mg/kg	NA*	5.00	NA*	30.00	7,670	20.00	**1,150**	ND(2)	NA*	NA*	99.00
	202	8/29/1991	Total Metals	NA*	NA*	mg/kg	NA*	ND(5)	NA*	27.00	7,840	16.00	**1,070**	ND(2)	NA*	NA*	82.00
	203	8/29/1991	Total Metals	NA*	NA*	mg/kg	NA*	6.00	NA*	29.00	8,060	33.00	**1,070**	ND(2)	NA*	NA*	82.00
	204	8/29/1991	Total Metals	NA*	NA*	mg/kg	NA*	8.00	NA*	40.00	9,670	27.00	**1,140**	ND(2)	NA*	NA*	90.00
	205	8/29/1991	Total Metals	NA*	NA*	mg/kg	NA*	12.00	NA*	48.00	11,200	26.00	**1,020**	ND(2)	NA*	NA*	120.0
	206	8/29/1991	Total Metals	NA*	NA*	mg/kg	NA*	**180.0**	NA*	1,050	11,800	**1,450**	650.0	13.00	NA*	NA*	220.0
	207	8/29/1991	Total Metals	NA*	NA*	mg/kg	NA*	**160.0**	NA*	1,280	11,800	**2,190**	**690.0**	21.00	NA*	NA*	290.0
	208	8/29/1991	Total Metals	NA*	NA*	mg/kg	NA*	**130.0**	NA*	650.0	8,070	970.0	360.0	7.00	NA*	NA*	240.0
	209	8/29/1991	Total Metals	NA*	NA*	mg/kg	NA*	**620.0**	NA*	4,200	18,000	**5,610**	340.0	54.00	NA*	NA*	260.0
	210	8/29/1991	Total Metals	NA*	NA*	mg/kg	NA*	**270.0**	NA*	1,420	15,000	**1,450**	300.0	22.00	NA*	NA*	140.0
Average[a]						**mg/kg**	NA*	**139.4**	NA*	877.4	10,911	**1,179**	**779.0**	12.70	NA*	NA*	162.3
1993 Pioneer Sediment Samples	SE-1	7/21/1993	Total Metals	NA*	NA*	mg/kg	**337.0**	**311.0**	6.90	830.0	10,800	**1,550**	372.0	52.30	ND(2.8)	NA*	241.0
	SE-2	7/21/1993	Total Metals	NA*	NA*	mg/kg	27.40	37.10	2.40	250.0	13,400	91.20	605.0	1.07	13.70	NA*	80.10
	SE-3	7/21/1993	Total Metals	NA*	NA*	mg/kg	6.07	10.20	0.90	18.80	3,710	21.00	206.0	0.06	ND(2.49)	NA*	32.60
	SE-500	7/21/1993	XRF Metals	NA*	NA*	mg/kg	**1,352**	**81.91**	NA*	921.7	13,412	1,034	551.0	NA*	NA*	93.60	76.15
	SE-1000	7/21/1993	XRF Metals	NA*	NA*	mg/kg	**1,834**	**104.5**	NA*	775.0	14,452	**1,163**	529.5	104.8	NA*	NA*	177.8
Average[a]						**mg/kg**	**711.2**	**108.9**	3.40	559.1	11,155	772.0	452.7	39.55	5.45	93.60	121.5
1995 Pioneer Sediment Samples	SE-1	10/19/1995	Total Metals	NA*	NA*	mg/kg	98.10	**286.0**	16.60	1,270	17,200	**1,600**	**784.0**	46.70	14.50	26.30	522.0
	SE-2	10/19/1995	Total Metals	NA*	NA*	mg/kg	64.50	**258.0**	8.10	1,060	13,800	**1,550**	**1,070**	24.70	5.40	23.20	288.0
	SE-3	10/19/1995	Total Metals	NA*	NA*	mg/kg	79.30	**223.0**	12.10	1,220	15,800	**1,450**	**707.0**	43.00	18.30	18.80	384.0
	SE-4	10/19/1995	Total Metals	NA*	NA*	mg/kg	26.70	**117.0**	5.60	582.0	11,800	768.0	639.0	14.30	8.10	9.70	157.0
Average[a]						**mg/kg**	67.15	**221.0**	10.60	1,033	14,650	**1,342**	**800.0**	32.18	11.58	19.50	337.8
1993 Pioneer Soils/Tailings Test Pit Samples	TP-1	7/21/1993	Unknown	NA*	NA*	mg/kg	**2,210**	**2,050**	**89.50**	9,620	28,300	**14,400**	462.0	**306.0**	3.29	NA*	584.0
	TP1A-1	7/21/1993	XRF Metals	NA*	NA*	mg/kg	**11,477**	**957.1**	**213.1**	8,771	25,660	**14,598**	**703.0**	**428.0**	NA*	623.3	544.3
	TP1A-2	7/21/1993	XRF Metals	NA*	NA*	mg/kg	**742.4**	NA*	NA*	387.3	14,242	716.5	336.4	NA*	NA*	NA*	180.3
	TP1B-1	7/21/1993	XRF Metals	NA*	NA*	mg/kg	**2,417**	**179.2**	NA*	1,159	12,078	**2,107**	NA*	97.57	NA*	156.1	102.7
	TP1B-2	7/21/1993	XRF Metals	NA*	NA*	mg/kg	**13,277**	**1,402**	**265.1**	10,142	34,376	**14,817**	**704.5**	**539.6**	NA*	810.8	560.3
	TP1B-3	7/21/1993	XRF Metals	NA*	NA*	mg/kg	173.3	**214.2**	NA*	1,843	18,480	275.4	**704.0**	NA*	NA*	NA*	114.6
	TP1C-1	7/21/1993	XRF Metals	NA*	NA*	mg/kg	**4,201**	**459.8**	NA*	3,871	28,591	**4,356**	364.2	**484.8**	NA*	165.4	497.6
	TP1C-2	7/21/1993	XRF Metals	NA*	NA*	mg/kg	**898.8**	NA*	NA*	1,250	10,620	914.4	333.3	115.1	NA*	NA*	194.0
	TP1C-3	7/21/1993	XRF Metals	NA*	NA*	mg/kg	**2,815**	**197.9**	NA*	1,348	17,697	**3,449**	**958.5**	**261.5**	NA*	103.8	455.0
	TP1D-1	7/21/1993	XRF Metals	NA*	NA*	mg/kg	**4,184**	**723.8**	NA*	6,881	33,141	**4,581**	**1,383**	**462.8**	NA*	109.0	488.3
	TP1D-2	7/21/1993	XRF Metals	NA*	NA*	mg/kg	135.4	**63.86**	NA*	1,003	19,429	240.2	570.2	NA*	NA*	NA*	286.1
	TP1D-3	7/21/1993	XRF Metals	NA*	NA*	mg/kg	62.22	NA*	NA*	632.3	17,001	46.07	552.8	NA*	NA*	NA*	198.4
	TP-1-COMP	7/21/1993	Total Metals	NA*	NA*	mg/kg	**12,217**	**1,129**	**406.5**	8,021	32,147	**12,842**	580.5	**590.4**	NA*	558.2	656.5
Average[a]						**mg/kg**	**4,216**	**737.7**	**243.6**	4,225	22,443	**5,642**	637.7	**365.1**	3.29	360.9	374.0

TABLE 3-25. HISTORICAL SOLID-MATRIX ANALYTICAL RESULTS - METALS
COMBINATION MILL AOC
BLACK PINE MINE

Description	Location	Date Sampled	Metals Analysis	Sample Start Depth (ft)	Sample End Depth (ft)	Units	Antimony	Arsenic	Cadmium	Copper	Iron	Lead	Manganese	Mercury	Nickel	Silver	Zinc
Risk Based Cleanup Guidelines[b] (mg/kg)							**293.0**	**40.4[ce]**	**19.5[c]**	**27,100.0**	**NS**	**1,100.0**	**665.0**	**220.0**	**14,650.0**	**NS**	**220,000.0**
1995 Pioneer Soils/Tailings Test Pit Samples	TP-2	10/19/1995	Unknown	NA*	NA*	mg/kg	229.0	**652.0**	15.90	1,910	10,700	**2,910**	357.0	122.0	ND(2.3)	65.00	353.0
	TP2A	10/19/1995	XRF Metals	NA*	NA*	mg/kg	**1,679**	**205.9**	NA*	839.9	13,184	**2,091**	NA*	122.3	NA*	NA*	274.5
	TP2B	10/19/1995	XRF Metals	NA*	NA*	mg/kg	**7,239**	**505.1**	NA*	2,977	23,903	**5,049**	**838.4**	**253.1**	NA*	272.0	249.5
	TP2C	10/19/1995	XRF Metals	NA*	NA*	mg/kg	**3,296**	**221.4**	NA*	1,165	17,717	**1,984**	NA*	115.9	NA*	161.2	258.9
	TP2D	10/19/1995	XRF Metals	NA*	NA*	mg/kg	**4,067**	**386.4**	NA*	2,141	17,817	**3,318**	NA*	**400.0**	NA*	182.8	354.5
	TP2EA	10/19/1995	XRF Metals	NA*	NA*	mg/kg	**2,246**	**296.3**	NA*	981.9	12,922	**1,899**	NA*	121.5	NA*	139.0	265.3
	TP2EB	10/19/1995	XRF Metals	NA*	NA*	mg/kg	**2,880**	**214.3**	NA*	956.9	15,701	**2,122**	NA*	139.2	NA*	111.7	334.7
	TP2-COMP-SOUP	10/19/1995	Total Metals	NA*	NA*	mg/kg	**4,243**	**289.0**	NA*	1,666	17,552	**3,343**	NA*	212.8	NA*	102.2	385.1
	TP-3	10/19/1995	XRF Metals	NA*	NA*	mg/kg	**447.0**	**1,230**	**36.40**	4,400	12,500	**7,620**	91.50	70.50	ND(3.3)	110.0	220.0
	TP3A	10/19/1995	XRF Metals	NA*	NA*	mg/kg	**5,605**	**364.6**	NA*	2,249	14,114	**3,889**	NA*	191.8	NA*	219.9	247.4
	TP3B	10/19/1995	XRF Metals	NA*	NA*	mg/kg	**5,780**	**378.9**	NA*	2,727	15,497	**4,334**	NA*	158.2	NA*	124.2	235.0
	TP3C	10/19/1995	XRF Metals	NA*	NA*	mg/kg	**5,097**	**248.2**	**143.2**	2,444	14,582	**3,445**	NA*	151.7	NA*	215.2	185.2
	TP3-COMP	10/19/1995	Total Metals	NA*	NA*	mg/kg	**4,120**	**339.8**	**180.3**	1,598	17,725	**3,253**	NA*	190.1	NA*	149.9	281.8
	TP-4	10/19/1995	XRF Metals	NA*	NA*	mg/kg	**485.0**	**1,490**	**39.50**	5,020	14,700	**9,000**	181.0	**282.0**	ND(3.5)	108.0	317.0
	TP4A	10/19/1995	XRF Metals	NA*	NA*	mg/kg	NA*	NA*	NA*	NA*	17,272	29.35	**697.8**	NA*	NA*	NA*	457.1
	TP4B	10/19/1995	Total Metals	NA*	NA*	mg/kg	**7,876**	**826.5**	NA*	3,211	25,317	**5,509**	373.1	**369.5**	NA*	244.2	342.1
Average[a]						**mg/kg**	**3,686**	**509.9**	**83.06**	2,286	16,325	**3,737**	423.1	193.4	1.52	157.5	297.6
2007 TMDL Sediment Sample	SFWILLOWC04	9/1/2007	Total Metals	NA*	NA*	mg/kg	43.80	**79.60**	9.56	1,100	12,900	870.0	**1,490**		12.00	14.30	273.0
2011 RI Sediment Samples at TMDL Sites (except CML-SD-05)	CML-SD-01	6/14/2011	Total Recoverable Metals	0	0.5	mg/kg	**317.0**	**223.0**	4.80	378.0	14,400	826.0	413.0	17.60	3.90	11.20	188.0
	CML-SD-02	6/15/2011	Total Recoverable Metals	0	0.5	mg/kg	**461.0**	**417.0**	8.90	1,430	22,700	**1,970**	**744.0**	13.60	6.90	25.60	317.0
	CML-SD-03	6/15/2011	Total Recoverable Metals	0	0.5	mg/kg	16.80	19.40	0.43	57.90	22,300	207.0	404.0	4.10	9.10	1.60	40.50
	CML-SD-04	6/14/2011	Total Recoverable Metals	0	0.5	mg/kg	16.70	27.90	1.40	109.0	12,400	74.20	**1,980**	14.40	11.40	2.20	144.0
	CML-SD-05	6/14/2011	Total Recoverable Metals	0	0.5	mg/kg	ND(0.64)	12.00	1.20	26.80	14,500	16.30	**1,160**	0.38	13.40	ND(0.64)	96.80
Average[a]						**mg/kg**	162.4	**139.9**	3.35	400.3	17,260	618.7	**940.2**	10.02	8.94	8.18	157.3
2011 RI Tailings Pond Sediment Samples	CML-SD-06	6/13/2011	Total Recoverable Metals	0	0.5	mg/kg	**891.0**	**642.0**	**28.60**	3,620	21,200	**3,760**	602.0	32.80	14.60	64.60	768.0
	CML-SD-07	6/14/2011	Total Recoverable Metals	0	0.5	mg/kg	**817.0**	**596.0**	15.40	5,320	21,800	**4,240**	**1,180**	10.10	6.10	37.60	393.0
Average[a]						**mg/kg**	**854.0**	**619.0**	**22.00**	4,470	21,500	**4,000**	**891.0**	21.45	10.35	51.10	580.5
2011 RI South Fork Lower Willow Creek Sediment Samples	CML-SD-08	6/14/2011	Total Recoverable Metals	0	0.5	mg/kg	**613.0**	**553.0**	11.50	1,390	20,100	**2,960**	443.0	12.10	5.80	34.80	430.0
	CML-SD-09	6/14/2011	Total Recoverable Metals	0	0.5	mg/kg	**465.0**	**377.0**	7.80	920.0	15,400	**2,070**	452.0	5.40	5.20	23.90	287.0
	CML-SD-10	6/14/2011	Total Recoverable Metals	0	0.5	mg/kg	**596.0**	**492.0**	10.30	1,160	19,700	**2,460**	419.0	7.00	4.90	38.20	401.0
	CML-SD-11	6/14/2011	Total Recoverable Metals	0	0.5	mg/kg	**307.0**	**219.0**	4.60	623.0	16,300	**1,170**	**1,210**	21.10	6.50	14.80	248.0
	CML-SD-13	6/16/2011	Total Recoverable Metals	0	0.5	mg/kg	**440.0**	**339.0**	7.70	NA*	17,300	NA*	NA*	17.40	6.90	23.10	257.0
	CML-SD-14	6/16/2011	Total Recoverable Metals	0	0.5	mg/kg	**1,010**	**668.0**	14.70	2,230	21,700	**3,270**	257.0	7.70	3.20	51.50	403.0
	CML-SD-15	6/16/2011	Total Recoverable Metals	0	0.5	mg/kg	**1,300**	**1,250**	**32.50**	4,810	35,900	**8,050**	342.0	9.20	4.10	213.0	1,300
	CML-SD-16	6/16/2011	Total Recoverable Metals	0	0.5	mg/kg	**2,130**	**1,670**	**26.60**	5,170	27,700	**7,330**	171.0	8.00	0.69	73.10	313.0
	CML-SD-17	6/16/2011	Total Recoverable Metals	0	0.5	mg/kg	**1,090**	**745.0**	17.10	1,910	23,800	**3,880**	325.0	10.50	2.50	56.10	496.0
Average[a]						**mg/kg**	**883.4**	**701.4**	14.76	2,277	21,989	**3,899**	452.4	10.93	4.42	58.72	459.4

TABLE 3-25. HISTORICAL SOLID-MATRIX ANALYTICAL RESULTS - METALS
COMBINATION MILL AOC
BLACK PINE MINE

Description	Location	Date Sampled	Metals Analysis	Sample Start Depth (ft)	Sample End Depth (ft)	Units	Antimony	Arsenic	Cadmium	Copper	Iron	Lead	Manganese	Mercury	Nickel	Silver	Zinc
Risk Based Cleanup Guidelines[b] (mg/kg)							**293.0**	**40.4[ce]**	**19.5[c]**	**27,100.0**	**NS**	**1,100.0**	**665.0**	**220.0**	**14,650.0**	**NS**	**220,000.0**
2011 RI Grid Sediment Samples	CML-SD-18	7/13/2011	Total Recoverable Metals	0	0.5	mg/kg	76.10	**211.0**	14.80	1,070	29,700	663.0	**1,640**	11.60	24.10	16.60	479.0
	CML-SD-19	7/13/2011	Total Recoverable Metals	0	0.5	mg/kg	**614.0**	**442.0**	15.40	727.0	11,900	**2,560**	264.0	2.80	ND(5.5)	47.00	238.0
	CML-SD-19	7/13/2011	Total Recoverable Metals	2	3	mg/kg	21.10	**43.60**	6.80	361.0	26,900	197.0	**920.0**	3.40	19.50	2.70	339.0
	CML-SD-20	7/12/2011	Total Recoverable Metals	0	0.5	mg/kg	**528.0**	**617.0**	**25.90**	2,430	19,400	**3,720**	**1,280**	8.60	ND(6.8)	50.70	335.0
	CML-SD-20	7/12/2011	Total Recoverable Metals	2	3	mg/kg	6.30	29.70	6.60	136.0	27,800	86.10	**1,040**	7.00	23.20	ND(2.8)	231.0
	CML-SD-21	7/12/2011	Total Recoverable Metals	0	0.5	mg/kg	**475.0**	**507.0**	**22.50**	1,630	19,200	**2,940**	474.0	6.30	6.30	43.60	413.0
	CML-SD-22	7/13/2011	Total Recoverable Metals	0	0.5	mg/kg	28.50	**58.20**	2.10	154.0	22,800	186.0	610.0	1.60	7.70	ND(2.6)	118.0
	CML-SD-23	7/13/2011	Total Recoverable Metals	0	0.5	mg/kg	40.90	**61.60**	2.40	249.0	31,600	282.0	568.0	5.80	10.50	ND(2.3)	92.40
	CML-SD-23	7/13/2011	Total Recoverable Metals	2	3	mg/kg	38.00	**48.40**	3.10	661.0	30,800	300.0	**789.0**	2.90	10.50	ND(2.2)	108.0
	CML-SD-24	7/12/2011	Total Recoverable Metals	0	0.5	mg/kg	95.00	**109.0**	6.50	500.0	16,500	617.0	**1,190**	4.90	10.40	7.30	269.0
	CML-SD-24	7/12/2011	Total Recoverable Metals	1	2	mg/kg	24.00	30.50	13.80	1,390	23,200	182.0	**2,050**	5.60	22.50	ND(2.9)	328.0
	CML-SD-25	7/12/2011	Total Recoverable Metals	0	0.5	mg/kg	184.0	**232.0**	12.60	837.0	19,900	**1,210**	**1,210**	3.50	13.30	12.70	326.0
	CML-SD-26	7/12/2011	Total Recoverable Metals	0	0.5	mg/kg	**312.0**	**291.0**	12.30	654.0	13,600	**1,870**	598.0	4.50	ND(5.7)	22.70	235.0
	CML-SD-27	7/12/2011	Total Recoverable Metals	0	0.5	mg/kg	172.0	**176.0**	8.00	1,130	14,100	1,050	**790.0**	10.40	6.20	14.20	175.0
	CML-SD-28	7/12/2011	Total Recoverable Metals	0	0.5	mg/kg	248.0	**265.0**	15.90	1,690	23,500	**1,440**	**1,070**	22.10	18.30	14.70	343.0
	CML-SD-29	7/12/2011	Total Recoverable Metals	0	0.5	mg/kg	**706.0**	**630.0**	**27.60**	2,060	17,300	**3,890**	352.0	4.10	ND(4.9)	58.10	359.0
	CML-SD-30	7/13/2011	Total Recoverable Metals	0	0.5	mg/kg	5.60	24.90	6.60	1,550	26,500	81.80	**974.0**	9.60	12.90	ND(2.5)	232.0
	CML-SD-31	7/12/2011	Total Recoverable Metals	0	0.5	mg/kg	272.0	**301.0**	13.50	2,950	22,600	**1,350**	**1,040**	2.10	9.50	19.30	370.0
	CML-SD-31	7/12/2011	Total Recoverable Metals	2	3	mg/kg	**406.0**	**382.0**	17.90	1,950	18,900	**2,350**	**1,190**	3.80	10.40	39.20	246.0
	CML-SD-32	7/12/2011	Total Recoverable Metals	0	0.5	mg/kg	**463.0**	**449.0**	16.00	921.0	19,300	**2,470**	558.0	10.90	7.20	21.60	387.0
	CML-SD-33	7/12/2011	Total Recoverable Metals	0	0.5	mg/kg	159.0	**155.0**	9.00	1,260	13,400	925.0	127.0	4.30	7.20	11.10	200.0

TABLE 3-25. HISTORICAL SOLID-MATRIX ANALYTICAL RESULTS - METALS
COMBINATION MILL AOC
BLACK PINE MINE

Description	Location	Date Sampled	Metals Analysis	Sample Start Depth (ft)	Sample End Depth (ft)	Units	Antimony	Arsenic	Cadmium	Copper	Iron	Lead	Manganese	Mercury	Nickel	Silver	Zinc
Risk Based Cleanup Guidelines[b] (mg/kg)							**293.0**	**40.4[ce]**	**19.5[c]**	**27,100.0**	**NS**	**1,100.0**	**665.0**	**220.0**	**14,650.0**	**NS**	**220,000.0**
2011 RI Grid Sediment Samples (cont)	CML-SD-33	7/12/2011	Total Recoverable Metals	1	2	mg/kg	**511.0**	**527.0**	**20.60**	1,420	14,200	**2,940**	163.0	1.10	ND(4.7)	46.60	260.0
	CML-SD-34	7/12/2011	Total Recoverable Metals	0	0.5	mg/kg	**683.0**	**315.0**	15.60	2,240	18,800	**2,840**	165.0	55.40	ND(11.9)	29.60	333.0
	CML-SD-35	7/12/2011	Total Recoverable Metals	0	0.5	mg/kg	**293.0**	**305.0**	12.90	1,740	22,100	**2,200**	**666.0**	57.90	7.50	31.30	344.0
	CML-SD-36	7/12/2011	Total Recoverable Metals	0	0.5	mg/kg	105.0	**125.0**	6.20	479.0	9,620	769.0	**788.0**	9.30	6.50	18.80	107.0
	CML-SD-37	7/12/2011	Total Recoverable Metals	0	0.5	mg/kg	88.90	**118.0**	4.40	276.0	36,900	693.0	569.0	8.10	4.70	10.80	164.0
	CML-SD-38	7/12/2011	Total Recoverable Metals	0	0.5	mg/kg	69.30	**101.0**	4.40	375.0	16,400	518.0	**1,300**	9.70	7.10	8.30	134.0
	CML-SD-39	7/13/2011	Total Recoverable Metals	0	0.5	mg/kg	23.00	27.20	2.20	180.0	11,900	238.0	415.0	5.30	12.10	ND(2.2)	101.0
	CML-SD-40	7/12/2011	Total Recoverable Metals	0	0.5	mg/kg	11.10	16.50	1.60	75.50	11,300	88.00	**781.0**	2.10	13.90	ND(3)	127.0
	CML-SD-41	7/12/2011	Total Recoverable Metals	0	0.5	mg/kg	239.0	**270.0**	13.10	653.0	24,900	**1,570**	485.0	5.40	ND(5)	46.30	170.0
	CML-SD-42	7/13/2011	Total Recoverable Metals	0	0.5	mg/kg	26.20	37.40	1.10	123.0	14,800	174.0	88.40	3.90	ND(4.4)	ND(2.2)	32.60
	CML-SD-42	7/13/2011	Total Recoverable Metals	2	3	mg/kg	40.50	**48.70**	2.40	309.0	15,400	240.0	323.0	5.00	9.00	2.70	71.90
	CML-SD-43	7/12/2011	Total Recoverable Metals	0	0.5	mg/kg	20.00	32.90	4.20	131.0	13,100	136.0	**936.0**	3.30	12.70	ND(3.1)	211.0
	CML-SD-44	7/12/2011	Total Recoverable Metals	0	0.5	mg/kg	7.90	29.50	1.30	97.90	37,400	168.0	160.0	6.90	19.20	ND(3.3)	202.0
	CML-SD-45	7/12/2011	Total Recoverable Metals	0	0.5	mg/kg	2.80	7.80	1.10	42.50	9,690	37.50	**739.0**	1.10	11.00	ND(2.5)	78.30
	CML-SD-46	7/12/2011	Total Recoverable Metals	0	0.5	mg/kg	8.00	10.50	1.50	68.90	25,900	55.00	183.0	12.70	25.40	ND(4.9)	227.0
Average[a]						**mg/kg**	194.5	**195.4**	9.78	903.4	20,314	**1,140**	**736.0**	8.97	10.37	15.35	233.0
2011 RI Subsurface Soils Samples in Tailings Test Pits	CML-SS-01	7/15/2011	Total Recoverable Metals	6	7	mg/kg	167.0	**123.0**	8.30	2,570	12,800	**1,120**	**1,300**	0.35	6.80	14.10	163.0
	CML-SS-02	7/15/2011	Total Recoverable Metals	6	7	mg/kg	10.00	11.90	3.10	2,360	5,640	67.70	67.20	9.10	5.30	1.00	108.0
	CML-SS-03	7/15/2011	Total Recoverable Metals	6	7	mg/kg	**750.0**	**777.0**	15.00	3,840	16,200	**5,310**	136.0	12.60	4.10	70.80	384.0
	CML-SS-04	7/15/2011	Total Recoverable Metals	6	8	mg/kg	164.0	**121.0**	9.60	1,230	10,700	393.0	359.0	81.10	9.20	10.10	208.0
	CML-SS-05	7/15/2011	Total Recoverable Metals	4	6	mg/kg	**1,260**	**1,030**	**23.10**	5,600	18,900	**8,010**	155.0	24.70	3.00	101.0	371.0
	CML-SS-06	7/15/2011	Total Recoverable Metals	5	7	mg/kg	19.20	**176.0**	**63.10**	367.0	14,600	77.10	165.0	79.30	19.90	3.70	576.0
	CML-SS-07	7/15/2011	Total Recoverable Metals	5	7	mg/kg	30.30	39.50	1.50	231.0	22,400	167.0	**1,600**	67.50	8.00	2.40	80.70
	CML-SS-08	7/15/2011	Total Recoverable Metals	7	9	mg/kg	1.90	8.30	0.12	35.10	18,800	20.10	457.0	130.0	7.00	7.10	178.0
	CML-SS-10	7/15/2011	Total Recoverable Metals	6	7	mg/kg	162.0	**173.0**	1.70	606.0	49,500	**1,830**	**1,050**	0.77	7.90	9.50	251.0
Average[a]						**mg/kg**	284.9	**273.3**	13.95	1,871	18,838	**1,888**	587.7	45.05	7.91	24.41	257.7

TABLE 3-25. HISTORICAL SOLID-MATRIX ANALYTICAL RESULTS - METALS
COMBINATION MILL AOC
BLACK PINE MINE

Description	Location	Date Sampled	Metals Analysis	Sample Start Depth (ft)	Sample End Depth (ft)	Units	Antimony	Arsenic	Cadmium	Copper	Iron	Lead	Manganese	Mercury	Nickel	Silver	Zinc
Risk Based Cleanup Guidelines[b] (mg/kg)							**293.0**	**40.4[ce]**	**19.5[c]**	**27,100.0**	**NS**	**1,100.0**	**665.0**	**220.0**	**14,650.0**	**NS**	**220,000.0**
2011 RI Tailings Samples in Tailings Test Pits	CML-TS-01	7/15/2011	Total Recoverable Metals	0	1	mg/kg	**324.0**	**262.0**	8.90	1,680	16,900	**2,300**	620.0	0.24	5.70	26.50	198.0
	CML-TS-01	7/15/2011	Total Recoverable Metals	2	4	mg/kg	23.30	24.20	8.70	2,140	13,300	144.0	269.0	1.00	13.30	1.30	213.0
	CML-TS-02	7/15/2011	Total Recoverable Metals	0	1	mg/kg	6.90	11.20	0.84	846.0	7,930	32.30	147.0	0.30	4.50	0.52	60.60
	CML-TS-02	7/15/2011	Total Recoverable Metals	2	4	mg/kg	7.50	11.30	2.30	92.00	9,680	44.90	297.0	1.90	13.90	1.10	159.0
	CML-TS-03	7/15/2011	Total Recoverable Metals	0	1	mg/kg	**1,370**	**1,640**	**31.80**	5,420	25,100	837.0	327.0	9.90	1.60	142.0	522.0
	CML-TS-03	7/15/2011	Total Recoverable Metals	2	4	mg/kg	**1,730**	**1,610**	**23.70**	6,240	29,300	**9,390**	167.0	5.50	0.69	110.0	735.0
	CML-TS-04	7/15/2011	Total Recoverable Metals	0	1	mg/kg	**548.0**	**390.0**	17.30	3,240	17,500	**2,460**	143.0	0.24	6.00	48.70	278.0
	CML-TS-04	7/15/2011	Total Recoverable Metals	2	4	mg/kg	52.20	**50.60**	7.10	846.0	19,000	181.0	298.0	13.10	8.50	4.20	139.0
	CML-TS-05	7/15/2011	Total Recoverable Metals	0	1	mg/kg	**409.0**	**353.0**	13.60	2,020	17,300	**1,840**	418.0	0.80	8.20	28.40	311.0
	CML-TS-05	7/15/2011	Total Recoverable Metals	2	4	mg/kg	**1,190**	**1,020**	**21.00**	3,690	20,600	**10,000**	172.0	2.50	2.70	79.90	654.0
	CML-TS-06	7/15/2011	Total Recoverable Metals	0	1	mg/kg	**1,040**	**830.0**	**30.70**	1,740	15,600	**6,790**	190.0	0.40	4.10	128.0	220.0
	CML-TS-06	7/15/2011	Total Recoverable Metals	2	4	mg/kg	**1,410**	**1,070**	**22.00**	4,040	22,600	**6,960**	246.0	46.10	2.40	99.90	334.0
	CML-TS-07	7/15/2011	Total Recoverable Metals	0	1	mg/kg	**529.0**	**496.0**	7.50	1,110	27,600	**2,650**	315.0	215.0	9.30	52.50	250.0
	CML-TS-07	7/15/2011	Total Recoverable Metals	2	4	mg/kg	**690.0**	**633.0**	12.50	941.0	15,500	**3,290**	289.0	**221.0**	1.60	96.20	334.0
	CML-TS-08	7/15/2011	Total Recoverable Metals	0	1	mg/kg	233.0	**188.0**	4.30	687.0	16,000	**1,290**	183.0	10.80	3.40	20.80	118.0
	CML-TS-08	7/15/2011	Total Recoverable Metals	5	7	mg/kg	**360.0**	**340.0**	8.20	1,610	26,600	**2,990**	**1,120**	7.40	3.70	113.0	194.0
	CML-TS-09	7/15/2011	Total Recoverable Metals	0	1	mg/kg	**3,210**	**2,440**	**49.20**	6,630	52,500	**9,520**	439.0	ND(0.024)	6.20	168.0	1,110
	CML-TS-09	7/15/2011	Total Recoverable Metals	2	4	mg/kg	**1,280**	**5,140**	13.20	3,120	60,700	**23,600**	84.40	0.64	3.60	119.0	122.0
	CML-TS-09	7/15/2011	Total Recoverable Metals	4	6	mg/kg	**2,540**	**4,980**	**35.20**	5,580	67,700	**15,100**	234.0	137.0	2.20	108.0	273.0
	CML-TS-09	7/15/2011	Total Recoverable Metals	6	8	mg/kg	**15,700**	**4,200**	**99.90**	22,700	50,700	**12,600**	**815.0**	4.10	20.70	159.0	1,570
	CML-TS-10	7/15/2011	Total Recoverable Metals	0	1	mg/kg	**1,090**	**1,250**	5.80	2,160	42,900	**8,010**	254.0	0.33	1.80	62.30	989.0
	CML-TS-10	7/15/2011	Total Recoverable Metals	2	4	mg/kg	**1,110**	**1,400**	4.40	1,340	21,600	**2,490**	169.0	0.59	ND(0.48)	10.50	419.0
Average[a]						**mg/kg**	**1,584**	**1,288**	19.46	3,540	27,119	**5,569**	327.1	30.86	5.65	71.81	418.3

[a] For non detect results, one half of the reporting limit was used in the calculation of the average concentration
[b] MT DEQ Risk Based Cleanup Guidelines (RBCG) Composite, Conservative Soil Cleanup Guidelines for Recreational Visitors Table 7-10 (DEQ 1996)
[c] Carcinogenic risk of 5E-07
[d] 1991 Schafer samples were collected at 15 locations, but data was reported for only 10 of the samples. Data was not reported for 88-1A, 88-1C, 88-2A, 88-9A, or 88-8C.
[e] UCL = 95th upper confidence limit on the arithmetic mean background concentration, from background samples

Bold values exceed DEQ RBCG values
Shading indicates relative concentrations values, dark represents higher relative concentrations
J qualifiers not shown, refer to Table 3-22 for qualifiers on 2011 data
ft - feet
mg/kg - milligrams per kilogram.
NA* - Not Applicable or not analyzed
ND() - Analyte was not detected (reporting limit)

TABLE 3-26. HISTORICAL SOLID-MATRIX ANALYTICAL RESULTS - METALS BY LOCATION
COMBINATION MILL AOC
BLACK PINE MINE

Description	Location	Date Sampled	Metals Analysis	Sample Start Depth (ft)	Sample End Depth (ft)	Units	Antimony	Arsenic	Cadmium	Copper	Iron	Lead	Manganese	Mercury	Nickel	Silver	Zinc
Risk Based Cleanup Guidelines[b] (mg/kg)							**293.0**	**40.4[cd]**	**19.5[c]**	**27,100.0**	**NS**	**1,100.0**	**665.0**	**220.0**	**14,650.0**	**NS**	**220,000.0**
Sediment and Soil Samples near TMDL SFLWILLOWC03	SE-1	7/21/1993	Total Metals	NA*	NA*	mg/kg	**337.0**	**311.0**	6.90	830.0	10,800	**1,550**	372.0	52.30	ND(2.8)	NA*	241.0
	SE-1	10/19/1995	Total Metals	NA*	NA*	mg/kg	98.10	**286.0**	16.60	1,270	17,200	**1,600**	**784.0**	46.70	14.50	26.30	522.0
	TP4A	10/19/1995	XRF Metals	NA*	NA*	mg/kg	NA*	NA*	NA*	NA*	17,272	29.35	**697.8**	NA*	NA*	NA*	457.1
	CML-SD-01	6/14/2011	Total Recoverable Metals	0	0.5	mg/kg	**317.0**	**223.0**	4.80	378.0	14,400	826.0	413.0	17.60	3.90	11.20	188.0
Average[a]						**mg/kg**	250.7	**273.3**	9.43	826.0	14,918	1,001	566.7	38.87	2.65	18.75	352.0
Sediment and Soil Samples below Amalgamation Mill	TP4B	10/19/1995	Total Metals	NA*	NA*	mg/kg	**7,876**	**826.5**	NA*	3,211	25,317	**5,509**	373.1	**369.5**	NA*	244.2	342.1
	SE-2	7/21/1993	Total Metals	NA*	NA*	mg/kg	27.40	37.10	2.40	250.0	13,400	91.20	605.0	1.07	13.70	NA*	80.10
	SE-2	10/19/1995	Total Metals	NA*	NA*	mg/kg	64.50	**258.0**	8.10	1,060	13,800	**1,550**	**1,070**	24.70	5.40	23.20	288.0
	CML-SD-08	6/14/2011	Total Recoverable Metals	0	0.5	mg/kg	**613.0**	**553.0**	11.50	1,390	20,100	**2,960**	443.0	12.10	5.80	34.80	430.0
	CML-SD-09	6/14/2011	Total Recoverable Metals	0	0.5	mg/kg	**465.0**	**377.0**	7.80	920.0	15,400	**2,070**	452.0	5.40	5.20	23.90	287.0
	CML-SD-13	6/16/2011	Total Recoverable Metals	0	0.5	mg/kg	**440.0**	**339.0**	7.70	NA*	17,300	NA*	NA*	17.40	6.90	23.10	257.0
	SE-3	10/19/1995	Total Metals	NA*	NA*	mg/kg	79.30	**223.0**	12.10	1,220	15,800	**1,450**	**707.0**	43.00	18.30	18.80	384.0
	SE-3	7/21/1993	Total Metals	NA*	NA*	mg/kg	6.07	10.20	0.900	18.80	3,710	21.00	206.0	0.062	ND(2.49)	NA*	32.60
Average[a]						**mg/kg**	**1,196**	**328.0**	7.21	1,153	15,603	**1,950**	550.9	59.15	8.08	61.34	262.6
Soil, Sediment, and Tailings Samples at Amalgamation Mill	TP3A	10/19/1995	XRF Metals	NA*	NA*	mg/kg	**5,605**	**364.6**	NA*	2,249	14,114	**3,889**	NA*	191.8	NA*	219.9	247.4
	TP3B	10/19/1995	XRF Metals	NA*	NA*	mg/kg	**5,780**	**378.9**	NA*	2,727	15,497	**4,334**	NA*	158.2	NA*	124.2	235.0
	TP3C	10/19/1995	XRF Metals	NA*	NA*	mg/kg	**5,097**	**248.2**	**143.2**	2,444	14,582	**3,445**	NA*	151.7	NA*	215.2	185.2
	CML-SD-14	6/16/2011	Total Recoverable Metals	0	0.5	mg/kg	**1,010**	**668.0**	14.70	2,230	21,700	**3,270**	257.0	7.70	3.20	51.50	403.0
Average[a]						**mg/kg**	**4,373**	**414.9**	**78.93**	2,413	16,473	**3,735**	257.0	127.4	3.20	152.7	267.6
Sediment, Soil, and Tailings Samples downstream of Tailings Impoundment and upstream of Amalgamation Mill	TP2A	10/19/1995	XRF Metals	NA*	NA*	mg/kg	**1,679**	**205.9**	NA*	839.9	13,184	**2,091**	NA*	122.3	NA*	NA*	274.5
	TP2B	10/19/1995	XRF Metals	NA*	NA*	mg/kg	**7,239**	**505.1**	NA*	2,977	23,903	**5,049**	**838.4**	**253.1**	NA*	272.0	249.5
	TP2C	10/19/1995	XRF Metals	NA*	NA*	mg/kg	**3,296**	**221.4**	NA*	1,165	17,717	**1,984**	NA*	115.9	NA*	161.2	258.9
	CML-SD-10	6/14/2011	Total Recoverable Metals	0	0.5	mg/kg	**596.0**	**492.0**	10.30	1,160	19,700	**2,460**	419.0	7.00	4.90	38.20	401.0
	CML-SD-15	6/16/2011	Total Recoverable Metals	0	0.5	mg/kg	**1,300**	**1,250**	**32.50**	4,810	35,900	**8,050**	342.0	9.20	4.10	213.0	1,300
	206	8/29/1991	Total Metals	NA*	NA*	mg/kg	NA*	**180.0**	NA*	1,050	11,800	**1,450**	650.0	13.00	NA*	NA*	220.0
	207	8/29/1991	Total Metals	NA*	NA*	mg/kg	NA*	**160.0**	NA*	1,280	11,800	**2,190**	**690.0**	21.00	NA*	NA*	290.0
	208	8/29/1991	Total Metals	NA*	NA*	mg/kg	NA*	**130.0**	NA*	650.0	8,070	970.0	360.0	7.00	NA*	NA*	240.0
	209	8/29/1991	Total Metals	NA*	NA*	mg/kg	NA*	**620.0**	NA*	4,200	18,000	**5,610**	340.0	54.00	NA*	NA*	260.0
	210	8/29/1991	Total Metals	NA*	NA*	mg/kg	NA*	**270.0**	NA*	1,420	15,000	**1,450**	300.0	22.00	NA*	NA*	140.0
	CML-SD-11	6/14/2011	Total Recoverable Metals	0	0.5	mg/kg	**307.0**	**219.0**	4.60	623.0	16,300	**1,170**	**1,210**	21.10	6.50	14.80	248.0
	88-9 A	8/28/1991	Total Metals	0.33	1.17	mg/kg	NA*	**260.0**	NA*	1,940	9,900	**2,440**	NA*	64.00	NA*	21.00	194.0
	TP2D	10/19/1995	XRF Metals	NA*	NA*	mg/kg	**4,067**	**386.4**	NA*	2,141	17,817	**3,318**	NA*	**400.0**	NA*	182.8	354.5
	CML-SD-16	6/16/2011	Total Recoverable Metals	0	0.5	mg/kg	**2,130**	**1,670**	**26.60**	5,170	27,700	**7,330**	171.0	8.00	0.690	73.10	313.0
	CML-SD-17	6/16/2011	Total Recoverable Metals	0	0.5	mg/kg	**1,090**	**745.0**	17.10	1,910	23,800	**3,880**	325.0	10.50	2.50	56.10	496.0
	SE-1000	7/21/1993	XRF Metals	NA*	NA*	mg/kg	**1,834**	**104.5**	NA*	775.0	14,452	**1,163**	529.5	104.8	NA*	NA*	177.8
	CML-SD-02	6/15/2011	Total Recoverable Metals	0	0.5	mg/kg	**461.0**	**417.0**	8.90	1,430	22,700	**1,970**	**744.0**	13.60	6.90	25.60	317.0
	SFWILLOW C04	9/1/2007	Total Metals	NA*	NA*	mg/kg	43.80	**79.60**	9.56	1,100	12,900	870.0	**1,490**		12.00	14.30	273.0
	88-8 B	8/29/1991	Total Metals	1.67	2.33	mg/kg	NA*	**1,090**	NA*	8,410	24,600	**21,300**	NA*	**393.0**	NA*	133.0	832.0
	SE-500	7/21/1993	XRF Metals	NA*	NA*	mg/kg	**1,352**	**81.91**	NA*	921.7	13,412	1,034	551.0	NA*	NA*	93.60	76.15
	TP2EA	10/19/1995	XRF Metals	NA*	NA*	mg/kg	**2,246**	**296.3**	NA*	981.9	12,922	**1,899**	NA*	121.5	NA*	139.0	265.3
	TP2EB	10/19/1995	XRF Metals	NA*	NA*	mg/kg	**2,880**	**214.3**	NA*	956.9	15,701	**2,122**	NA*	139.2	NA*	111.7	334.7
Average[a]						**mg/kg**	**2,035**	**436.3**	15.65	2,087	17,604	**3,627**	597.3	95.01	5.37	103.3	341.6
Sediment Samples in Tailings Sediment Ponds	CML-SD-06	6/13/2011	Total Recoverable Metals	0	0.5	mg/kg	**891.0**	**642.0**	**28.60**	3,620	21,200	**3,760**	602.0	32.80	14.60	64.60	768.0
	CML-SD-07	6/14/2011	Total Recoverable Metals	0	0.5	mg/kg	**817.0**	**596.0**	15.40	5,320	21,800	**4,240**	**1,180**	10.10	6.10	37.60	393.0
Average[a]						**mg/kg**	**854.0**	**619.0**	**22.00**	4,470	21,500	**4,000**	**891.0**	21.45	10.35	51.10	580.5

TABLE 3-26. HISTORICAL SOLID-MATRIX ANALYTICAL RESULTS - METALS BY LOCATION
COMBINATION MILL AOC
BLACK PINE MINE

Description	Location	Date Sampled	Metals Analysis	Sample Start Depth (ft)	Sample End Depth (ft)	Units	Antimony	Arsenic	Cadmium	Copper	Iron	Lead	Manganese	Mercury	Nickel	Silver	Zinc
Risk Based Cleanup Guidelines[b] (mg/kg)							**293.0**	**40.4[cd]**	**19.5[c]**	**27,100.0**	**NS**	**1,100.0**	**665.0**	**220.0**	**14,650.0**	**NS**	**220,000.0**
Sediment, Soil, and Tialings Samples west of Tailings Impoundment	CML-SD-18	7/13/2011	Total Recoverable Metals	0	0.5	mg/kg	76.10	**211.0**	14.80	1,070	29,700	663.0	**1,640**	11.60	24.10	16.60	479.0
	CML-SD-19	7/13/2011	Total Recoverable Metals	0	0.5	mg/kg	**614.0**	**442.0**	15.40	727.0	11,900	**2,560**	264.0	2.80	ND(5.5)	47.00	238.0
	CML-SD-19	7/13/2011	Total Recoverable Metals	2	3	mg/kg	21.10	**43.60**	6.80	361.0	26,900	197.0	**920.0**	3.40	19.50	2.70	339.0
	CML-SD-20	7/12/2011	Total Recoverable Metals	0	0.5	mg/kg	**528.0**	**617.0**	**25.90**	2,430	19,400	**3,720**	**1,280**	8.60	ND(6.8)	50.70	335.0
	CML-SD-20	7/12/2011	Total Recoverable Metals	2	3	mg/kg	6.30	29.70	6.60	136.0	27,800	86.10	**1,040**	7.00	23.20	ND(2.8)	231.0
	CML-SD-21	7/12/2011	Total Recoverable Metals	0	0.5	mg/kg	**475.0**	**507.0**	**22.50**	1,630	19,200	**2,940**	474.0	6.30	6.30	43.60	413.0
	SE-4	10/19/1995	Total Metals	NA*	NA*	mg/kg	26.70	**117.0**	5.60	582.0	11,800	768.0	639.0	14.30	8.10	9.70	157.0
	CML-SD-22	7/13/2011	Total Recoverable Metals	0	0.5	mg/kg	28.50	**58.20**	2.10	154.0	22,800	186.0	610.0	1.60	7.70	ND(2.6)	118.0
	CML-SD-23	7/13/2011	Total Recoverable Metals	0	0.5	mg/kg	40.90	**61.60**	2.40	249.0	31,600	282.0	568.0	5.80	10.50	ND(2.3)	92.40
	CML-SD-23	7/13/2011	Total Recoverable Metals	2	3	mg/kg	38.00	**48.40**	3.10	661.0	30,800	300.0	**789.0**	2.90	10.50	ND(2.2)	108.0
	CML-SD-24	7/12/2011	Total Recoverable Metals	0	0.5	mg/kg	95.00	**109.0**	6.50	500.0	16,500	617.0	**1,190**	4.90	10.40	7.30	269.0
	CML-SD-24	7/12/2011	Total Recoverable Metals	1	2	mg/kg	24.00	30.50	13.80	1,390	23,200	182.0	**2,050**	5.60	22.50	ND(2.9)	328.0
	CML-SD-25	7/12/2011	Total Recoverable Metals	0	0.5	mg/kg	184.0	**232.0**	12.60	837.0	19,900	**1,210**	**1,210**	3.50	13.30	12.70	326.0
	CML-SD-26	7/12/2011	Total Recoverable Metals	0	0.5	mg/kg	**312.0**	**291.0**	12.30	654.0	13,600	**1,870**	598.0	4.50	ND(5.7)	22.70	235.0
	88-10 A	8/28/1991	Total Metals	0	2	mg/kg	NA*	**1,150**	NA*	8,650	11,400	**20,500**	NA*	80.00	NA*	42.00	256.0
	CML-SD-27	7/12/2011	Total Recoverable Metals	0	0.5	mg/kg	172.0	**176.0**	8.00	1,130	14,100	1,050	**790.0**	10.40	6.20	14.20	175.0
	CML-SD-28	7/12/2011	Total Recoverable Metals	0	0.5	mg/kg	248.0	**265.0**	15.90	1,690	23,500	**1,440**	**1,070**	22.10	18.30	14.70	343.0
	CML-SD-29	7/12/2011	Total Recoverable Metals	0	0.5	mg/kg	**706.0**	**630.0**	**27.60**	2,060	17,300	**3,890**	352.0	4.10	ND(4.9)	58.10	359.0
	CML-SD-30	7/13/2011	Total Recoverable Metals	0	0.5	mg/kg	5.60	24.90	6.60	1,550	26,500	81.80	**974.0**	9.60	12.90	ND(2.5)	232.0
	CML-SD-31	7/12/2011	Total Recoverable Metals	0	0.5	mg/kg	272.0	**301.0**	13.50	2,950	22,600	**1,350**	**1,040**	2.10	9.50	19.30	370.0
	CML-SD-31	7/12/2011	Total Recoverable Metals	2	3	mg/kg	**406.0**	**382.0**	17.90	1,950	18,900	**2,350**	**1,190**	3.80	10.40	39.20	246.0
	CML-SD-32	7/12/2011	Total Recoverable Metals	0	0.5	mg/kg	**463.0**	**449.0**	16.00	921.0	19,300	**2,470**	558.0	10.90	7.20	21.60	387.0
	88-11 A	8/28/1991	Total Metals	0	2	mg/kg	NA*	**548.0**	NA*	591.0	6,170	**5,480**	NA*	15.00	NA*	14.00	302.0
	CML-SD-33	7/12/2011	Total Recoverable Metals	0	0.5	mg/kg	159.0	**155.0**	9.00	1,260	13,400	925.0	127.0	4.30	7.20	11.10	200.0
	CML-SD-33	7/12/2011	Total Recoverable Metals	1	2	mg/kg	**511.0**	**527.0**	**20.60**	1,420	14,200	**2,940**	163.0	1.10	ND(4.7)	46.60	260.0
	CML-TS-10	7/15/2011	Total Recoverable Metals	0	1	mg/kg	**1,090**	**1,250**	5.80	2,160	42,900	**8,010**	254.0	0.330	1.80	62.30	989.0
	CML-TS-10	7/15/2011	Total Recoverable Metals	2	4	mg/kg	**1,110**	**1,400**	4.40	1,340	21,600	**2,490**	169.0	0.590	ND(0.48)	10.50	419.0
	CML-SS-10	7/15/2011	Total Recoverable Metals	6	7	mg/kg	162.0	**173.0**	1.70	606.0	49,500	**1,830**	**1,050**	0.770	7.90	9.50	251.0
	CML-SD-34	7/12/2011	Total Recoverable Metals	0	0.5	mg/kg	**683.0**	**315.0**	15.60	2,240	18,800	**2,840**	165.0	55.40	ND(11.9)	29.60	333.0
	CML-SD-35	7/12/2011	Total Recoverable Metals	0	0.5	mg/kg	**293.0**	**305.0**	12.90	1,740	22,100	**2,200**	**666.0**	57.90	7.50	31.30	344.0
	CML-SD-36	7/12/2011	Total Recoverable Metals	0	0.5	mg/kg	105.0	**125.0**	6.20	479.0	9,620	769.0	**788.0**	9.30	6.50	18.80	107.0
	88-3 B	8/27/1991	Total Metals	1.5	2	mg/kg	NA*	**445.0**	NA*	1,080	10,400	**3,180**	NA*	2.00	NA*	66.00	116.0
	CML-SD-37	7/12/2011	Total Recoverable Metals	0	0.5	mg/kg	88.90	**118.0**	4.40	276.0	36,900	693.0	569.0	8.10	4.70	10.80	164.0
	CML-SD-38	7/12/2011	Total Recoverable Metals	0	0.5	mg/kg	69.30	**101.0**	4.40	375.0	16,400	518.0	**1,300**	9.70	7.10	8.30	134.0
	CML-SD-39	7/13/2011	Total Recoverable Metals	0	0.5	mg/kg	23.00	27.20	2.20	180.0	11,900	238.0	415.0	5.30	12.10	ND(2.2)	101.0
	CML-SD-40	7/12/2011	Total Recoverable Metals	0	0.5	mg/kg	11.10	16.50	1.60	75.50	11,300	88.00	**781.0**	2.10	13.90	ND(3)	127.0
	CML-SD-41	7/12/2011	Total Recoverable Metals	0	0.5	mg/kg	239.0	**270.0**	13.10	653.0	24,900	**1,570**	485.0	5.40	ND(5)	46.30	170.0
	CML-SD-42	7/13/2011	Total Recoverable Metals	0	0.5	mg/kg	26.20	37.40	1.10	123.0	14,800	174.0	88.40	3.90	ND(4.4)	ND(2.2)	32.60
	CML-SD-42	7/13/2011	Total Recoverable Metals	2	3	mg/kg	40.50	**48.70**	2.40	309.0	15,400	240.0	323.0	5.00	9.00	2.70	71.90
	CML-SD-43	7/12/2011	Total Recoverable Metals	0	0.5	mg/kg	20.00	32.90	4.20	131.0	13,100	136.0	**936.0**	3.30	12.70	ND(3.1)	211.0
	CML-SD-44	7/12/2011	Total Recoverable Metals	0	0.5	mg/kg	7.90	29.50	1.30	97.90	37,400	168.0	160.0	6.90	19.20	ND(3.3)	202.0
	CML-SD-45	7/12/2011	Total Recoverable Metals	0	0.5	mg/kg	2.80	7.80	1.10	42.50	9,690	37.50	**739.0**	1.10	11.00	ND(2.5)	78.30
	CML-SD-46	7/12/2011	Total Recoverable Metals	0	0.5	mg/kg	8.00	10.50	1.50	68.90	25,900	55.00	183.0	12.70	25.40	ND(4.9)	227.0
Average[a]						**mg/kg**	234.8	**281.8**	9.24	1,105	20,583	**1,937**	**715.2**	10.14	9.88	18.79	252.9

TABLE 3-26. HISTORICAL SOLID-MATRIX ANALYTICAL RESULTS - METALS BY LOCATION
COMBINATION MILL AOC
BLACK PINE MINE

Description	Location	Date Sampled	Metals Analysis	Sample Start Depth (ft)	Sample End Depth (ft)	Units	Antimony	Arsenic	Cadmium	Copper	Iron	Lead	Manganese	Mercury	Nickel	Silver	Zinc
Risk Based Cleanup Guidelines[b] (mg/kg)							**293.0**	**40.4[cd]**	**19.5[c]**	**27,100.0**	**NS**	**1,100.0**	**665.0**	**220.0**	**14,650.0**	**NS**	**220,000.0**
Soil Samples from Tailings Impoundment	BP-1	9/13/1990	Total Metals	NA*	NA*	mg/kg	NA*	ND(8)	ND(0.8)	63.50	7,282	53.90	**907.0**	2.45	NA*	ND(0.1)	91.40
	BP-2	9/13/1990	Total Metals	NA*	NA*	mg/kg	NA*	**212.0**	9.31	1,570	8,970	**1,580**	485.0	47.00	NA*	27.70	139.0
	BP-3	9/13/1990	Total Metals	NA*	NA*	mg/kg	NA*	**460.0**	13.10	1,580	12,550	**2,890**	386.0	60.00	NA*	36.20	344.0
	CML-SS-01	7/15/2011	Total Recoverable Metals	6	7	mg/kg	167.0	**123.0**	8.30	2,570	12,800	**1,120**	**1,300**	0.350	6.80	14.10	163.0
	CML-SS-02	7/15/2011	Total Recoverable Metals	6	7	mg/kg	10.00	11.90	3.10	2,360	5,640	67.70	67.20	9.10	5.30	1.00	108.0
	CML-SS-03	7/15/2011	Total Recoverable Metals	6	7	mg/kg	**750.0**	**777.0**	15.00	3,840	16,200	**5,310**	136.0	12.60	4.10	70.80	384.0
	CML-SS-04	7/15/2011	Total Recoverable Metals	6	8	mg/kg	164.0	**121.0**	9.60	1,230	10,700	393.0	359.0	81.10	9.20	10.10	208.0
	CML-SS-05	7/15/2011	Total Recoverable Metals	4	6	mg/kg	**1,260**	**1,030**	**23.10**	5,600	18,900	**8,010**	155.0	24.70	3.00	101.0	371.0
	CML-SS-06	7/15/2011	Total Recoverable Metals	5	7	mg/kg	19.20	**176.0**	**63.10**	367.0	14,600	77.10	165.0	79.30	19.90	3.70	576.0
	CML-SS-07	7/15/2011	Total Recoverable Metals	5	7	mg/kg	30.30	39.50	1.50	231.0	22,400	167.0	**1,600**	67.50	8.00	2.40	80.70
	CML-SS-08	7/15/2011	Total Recoverable Metals	7	9	mg/kg	1.90	8.30	0.120	35.10	18,800	20.10	457.0	130.0	7.00	7.10	178.0
Average[a]						**mg/kg**	**300.3**	**269.3**	13.33	1,768	13,531	**1,790**	547.0	46.74	7.91	24.92	240.3
Tailings Samples from Tailings Impoundment	TP1D-1	7/21/1993	XRF Metals	NA*	NA*	mg/kg	**4,184**	**723.8**	NA*	6,881	33,141	**4,581**	**1,383**	**462.8**	NA*	109.0	488.3
	TP1D-2	7/21/1993	XRF Metals	NA*	NA*	mg/kg	135.4	**63.86**	NA*	1,003	19,429	240.2	570.2	NA*	NA*	NA*	286.1
	TP1D-3	7/21/1993	XRF Metals	NA*	NA*	mg/kg	62.22	NA*	NA*	632.3	17,001	46.07	552.8	NA*	NA*	NA*	198.4
	BP-Tailings	9/13/1990	Total Metals	NA*	NA*	mg/kg	NA*	**1,684**	**45.79**	5,084	18,070	**10,650**	168.4	**250.0**	NA*	87.80	520.0
	CML-TS-01	7/15/2011	Total Recoverable Metals	0	1	mg/kg	**324.0**	**262.0**	8.90	1,680	16,900	**2,300**	620.0	0.240	5.70	26.50	198.0
	CML-TS-01	7/15/2011	Total Recoverable Metals	2	4	mg/kg	23.30	24.20	8.70	2,140	13,300	144.0	269.0	1.00	13.30	1.30	213.0
	88-7 A	8/28/1991	Total Metals	0	0.5	mg/kg	NA*	**457.0**	NA*	3,860	10,000	**5,220**	NA*	71.00	NA*	44.00	285.0
	CML-TS-02	7/15/2011	Total Recoverable Metals	0	1	mg/kg	6.90	11.20	0.840	846.0	7,930	32.30	147.0	0.300	4.50	0.520	60.60
	CML-TS-02	7/15/2011	Total Recoverable Metals	2	4	mg/kg	7.50	11.30	2.30	92.00	9,680	44.90	297.0	1.90	13.90	1.10	159.0
	CML-TS-03	7/15/2011	Total Recoverable Metals	0	1	mg/kg	**1,370**	**1,640**	**31.80**	5,420	25,100	837.0	327.0	9.90	1.60	142.0	522.0
	CML-TS-03	7/15/2011	Total Recoverable Metals	2	4	mg/kg	**1,730**	**1,610**	**23.70**	6,240	29,300	**9,390**	167.0	5.50	0.690	110.0	735.0
	88-6 A	8/28/1991	Total Metals	0	1	mg/kg	NA*	**733.0**	NA*	2,890	8,240	**8,150**	NA*	124.0	NA*	70.00	221.0
	CML-TS-04	7/15/2011	Total Recoverable Metals	0	1	mg/kg	**548.0**	**390.0**	17.30	3,240	17,500	**2,460**	143.0	0.240	6.00	48.70	278.0
	CML-TS-04	7/15/2011	Total Recoverable Metals	2	4	mg/kg	52.20	**50.60**	7.10	846.0	19,000	181.0	298.0	13.10	8.50	4.20	139.0
	TP1C-1	7/21/1993	XRF Metals	NA*	NA*	mg/kg	**4,201**	**459.8**	NA*	3,871	28,591	**4,356**	364.2	**484.8**	NA*	165.4	497.6
	TP1C-2	7/21/1993	XRF Metals	NA*	NA*	mg/kg	**898.8**	NA*	NA*	1,250	10,620	914.4	333.3	115.1	NA*	NA*	194.0
	TP1C-3	7/21/1993	XRF Metals	NA*	NA*	mg/kg	**2,815**	**197.9**	NA*	1,348	17,697	**3,449**	**958.5**	**261.5**	NA*	103.8	455.0
	CML-TS-05	7/15/2011	Total Recoverable Metals	0	1	mg/kg	**409.0**	**353.0**	13.60	2,020	17,300	**1,840**	418.0	0.800	8.20	28.40	311.0
	CML-TS-05	7/15/2011	Total Recoverable Metals	2	4	mg/kg	**1,190**	**1,020**	**21.00**	3,690	20,600	**10,000**	172.0	2.50	2.70	79.90	654.0
	88-1 B	8/27/1991	Total Metals	0.67	1.33	mg/kg	NA*	**187.0**	NA*	1,450	6,740	**1,940**	NA*	7.00	NA*	54.00	146.0
	CML-TS-06	7/15/2011	Total Recoverable Metals	0	1	mg/kg	**1,040**	**830.0**	**30.70**	1,740	15,600	**6,790**	190.0	0.400	4.10	128.0	220.0
	CML-TS-06	7/15/2011	Total Recoverable Metals	2	4	mg/kg	**1,410**	**1,070**	**22.00**	4,040	22,600	**6,960**	246.0	46.10	2.40	99.90	334.0
	TP1B-1	7/21/1993	XRF Metals	NA*	NA*	mg/kg	**2,417**	**179.2**	NA*	1,159	12,078	**2,107**	NA*	97.57	NA*	156.1	102.7
	TP1B-2	7/21/1993	XRF Metals	NA*	NA*	mg/kg	**13,277**	**1,402**	**265.1**	10,142	34,376	**14,817**	**704.5**	**539.6**	NA*	810.8	560.3
	TP1B-3	7/21/1993	XRF Metals	NA*	NA*	mg/kg	173.3	**214.2**	NA*	1,843	18,480	275.4	**704.0**	NA*	NA*	NA*	114.6
	CML-TS-07	7/15/2011	Total Recoverable Metals	0	1	mg/kg	**529.0**	**496.0**	7.50	1,110	27,600	**2,650**	315.0	215.0	9.30	52.50	250.0
	CML-TS-07	7/15/2011	Total Recoverable Metals	2	4	mg/kg	**690.0**	**633.0**	12.50	941.0	15,500	**3,290**	289.0	**221.0**	1.60	96.20	334.0
	88-4 A	8/27/1991	Total Metals	0	1	mg/kg	NA*	**613.0**	NA*	1,830	13,600	**4,860**	NA*	34.00	NA*	494.0	430.0
	88-5 A	8/27/1991	Total Metals	0.67	1.67	mg/kg	NA*	**469.0**	NA*	1,340	17,300	**4,640**	NA*	15.00	NA*	573.0	403.0
	CML-TS-08	7/15/2011	Total Recoverable Metals	0	1	mg/kg	233.0	**188.0**	4.30	687.0	16,000	**1,290**	183.0	10.80	3.40	20.80	118.0
	CML-TS-08	7/15/2011	Total Recoverable Metals	5	7	mg/kg	**360.0**	**340.0**	8.20	1,610	26,600	**2,990**	**1,120**	7.40	3.70	113.0	194.0
	CML-TS-09	7/15/2011	Total Recoverable Metals	0	1	mg/kg	**3,210**	**2,440**	**49.20**	6,630	52,500	**9,520**	439.0	ND(0.024)	6.20	168.0	1,110
	CML-TS-09	7/15/2011	Total Recoverable Metals	2	4	mg/kg	**1,280**	**5,140**	13.20	3,120	60,700	**23,600**	84.40	0.640	3.60	119.0	122.0
	CML-TS-09	7/15/2011	Total Recoverable Metals	4	6	mg/kg	**2,540**	**4,980**	**35.20**	5,580	67,700	**15,100**	234.0	137.0	2.20	108.0	273.0
	CML-TS-09	7/15/2011	Total Recoverable Metals	6	8	mg/kg	**15,700**	**4,200**	**99.90**	22,700	50,700	**12,600**	**815.0**	4.10	20.70	159.0	1,570
	TP1A-1	7/21/1993	XRF Metals	NA*	NA*	mg/kg	**11,477**	**957.1**	**213.1**	8,771	25,660	**14,598**	**703.0**	**428.0**	NA*	623.3	544.3
	TP1A-2	7/21/1993	XRF Metals	NA*	NA*	mg/kg	**742.4**	NA*	NA*	387.3	14,242	716.5	336.4	NA*	NA*	NA*	180.3
Average[a]						**mg/kg**	**2,356**	**1,001**	**40.95**	3,463	22,632	**5,232**	437.1	78.60	6.11	149.9	362.7

TABLE 3-26. HISTORICAL SOLID-MATRIX ANALYTICAL RESULTS - METALS BY LOCATION
COMBINATION MILL AOC
BLACK PINE MINE

Description	Location	Date Sampled	Metals Analysis	Sample Start Depth (ft)	Sample End Depth (ft)	Units	Antimony	Arsenic	Cadmium	Copper	Iron	Lead	Manganese	Mercury	Nickel	Silver	Zinc
Risk Based Cleanup Guidelines[b] (mg/kg)							**293.0**	**40.4[cd]**	**19.5[c]**	**27,100.0**	**NS**	**1,100.0**	**665.0**	**220.0**	**14,650.0**	**NS**	**220,000.0**
Sediment and Soil Samples upstream of Combination Mill and Tailings Impoundment	CML-SD-03	6/15/2011	Total Recoverable Metals	0	0.5	mg/kg	16.80	19.40	0.430	57.90	22,300	207.0	404.0	4.10	9.10	1.60	40.50
	CML-SD-04	6/14/2011	Total Recoverable Metals	0	0.5	mg/kg	16.70	27.90	1.40	109.0	12,400	74.20	**1,980**	14.40	11.40	2.20	144.0
	201	8/29/1991	Total Metals	NA*	NA*	mg/kg	NA*	5.00	NA*	30.00	7,670	20.00	**1,150**	ND(2)	NA*	NA*	99.00
	202	8/29/1991	Total Metals	NA*	NA*	mg/kg	NA*	ND(5)	NA*	27.00	7,840	16.00	**1,070**	ND(2)	NA*	NA*	82.00
	203	8/29/1991	Total Metals	NA*	NA*	mg/kg	NA*	6.00	NA*	29.00	8,060	33.00	**1,070**	ND(2)	NA*	NA*	82.00
	204	8/29/1991	Total Metals	NA*	NA*	mg/kg	NA*	8.00	NA*	40.00	9,670	27.00	**1,140**	ND(2)	NA*	NA*	90.00
	205	8/29/1991	Total Metals	NA*	NA*	mg/kg	NA*	12.00	NA*	48.00	11,200	26.00	**1,020**	ND(2)	NA*	NA*	120.0
	CML-SD-05	6/14/2011	Total Recoverable Metals	0	0.5	mg/kg	**ND(0.64)**	12.00	1.20	26.80	14,500	16.30	**1,160**	0.380	13.40	ND(0.64)	96.80
Average[a]						**mg/kg**	11.27	11.60	1.01	45.96	11,705	52.44	**1,124**	2.99	11.30	1.37	94.29

[a] For non detect results, one half of the reporting limit was used in the calculation of the average concentration

[b] MT DEQ Risk Based Cleanup Guidelines (RBCG) Composite, Conservative Soil Cleanup Guidelines for Recreational Visitors Table 7-10 (DEQ 1996)

[c] Carcinogenic risk of 5E-07

[d] UCL = 95th upper confidence limit on the arithmetic mean background concentration, from background samples

Bold values exceed DEQ RBCG values

Shading indicates relative concentrations values, dark represents higher relative concentrations

J qualifiers not shown, refer to Table 3-22 for qualifiers on 2011 data

ft - feet

mg/kg - milligrams per kilogram.

NA* - Not Applicable or not analyzed

ND() - Analyte was not detected (reporting limit)

NS - A standard has not been adopted

TABLE 3-27. ACID BASE ACCOUNTING RESULTS
COMBINATION MILL AOC
BLACK PINE MINE

Location	Date Sampled	Sample Start Depth (ft)	Sample End Depth (ft)	Acid Base Potential** (t/1000t)	Acid Potential (t/1000t)	Neutralization Potential (t/1000t)	pH, SMP Buffer (Standard Units)	Recommended Lime (t/1000t)	SMP Lime Requirement (t/1000t)	Sulfur (HCL Extraction) (%)	Sulfur (HNO3 Extraction) (%)	Sulfur (Hot Water Extraction) (%)	Sulfur, Residual (%)	Sulfur, Total (%)
CML-TS-01	7/15/2011	2	4	2.2	ND(4.3)	2.2	5.9	8.1	5.9	ND(0.05)	ND(0.05)	ND(0.05)	ND(0.05)	ND(0.05)
CML-TS-02	7/15/2011	2	4	3.2	ND(4.3)	3.2	5.9	11	5.9	ND(0.05)	0.0754	0.0697	ND(0.05)	0.174
CML-TS-03	7/15/2011	2	4	0.74	ND(4.3)	0.74	7	ND(5.4)	0	0.0702	ND(0.05)	0.126	ND(0.05)	0.201
CML-TS-04	7/15/2011	2	4	1.2	ND(4.3)	1.2 J	5.8	11	8.1	ND(0.05)	ND(0.05)	ND(0.05)	ND(0.05)	ND(0.05)
CML-TS-05	7/15/2011	2	4	-1.6	1.6	ND(0.5) UJ	6.6	5	2.4	ND(0.05)	0.0507	0.106	ND(0.05)	0.155
CML-TS-06	7/15/2011	2	4	2.4	ND(4.3)	2.4 J	7.3	ND(5.4)	0	ND(0.05)	ND(0.05)	ND(0.05)	ND(0.05)	0.097
CML-TS-07	7/15/2011	2	4	0.73	ND(4.3)	0.73	7.3	ND(5.4)	0	ND(0.05)	ND(0.05)	ND(0.05)	ND(0.05)	0.053
CML-TS-08	7/15/2011	5	7	8.3	ND(4.3)	8.3	7.1	ND(5.4)	0	ND(0.05)	ND(0.05)	ND(0.05)	ND(0.05)	0.0605
CML-TS-10	7/15/2011	0	1	0	ND(4.3)	ND(0.5) UJ	6.9	ND(5.4)	0.3	0.0825	ND(0.05)	0.144	ND(0.05)	0.227

J – Estimated concentration
UJ – Estimated reporting limit
ft - feet
t/1000t = tons of Calcium Carbonate ($CaCO_3$) per 1,000 tons waste
ND() - Analyte was not detected (reporting limit)

** Acid/Base Potential = NP - AP
Potentially Acid Generating:
Uncertain Acid Generation Potential:
Unlikely to Generate Acid:

NP:AP < 1 and NNP < -20 tons/kton
NP:AP between 1 and 3 and/or NNP between -20 and +20 tons/kton
NNP < +20 tons/kton

NP = Neutralization Potential
AP = Acid Potential
NNP = Net Neutralizing Potential = Base - Acid Potential

TABLE 3-28. SURFACE WATER ANALYTICAL RESULTS - TOTAL RECOVERABLE METALS
DEQ RISK BASED CLEANUP GUIDELINES
COMBINATION MILL AOC
BLACK PINE MINE

Location	Date Sampled	Discharge (cfs)	Units	Antimony	Arsenic	Barium	Cadmium	Chromium	Copper	Iron	Lead	Manganese	Mercury	Nickel	Silver	Zinc
Risk Based Cleanup Guidelines[a] (ug/L)				**91.10**	**0.06[b]**	**17,474**	**66.50**	**100,246**	**472.0**	**4,979**	**47.10**	**16.60**	**0.150**	**931.0**	**NS**	**17.20**
CML-SW-01	6/15/2011	76.50	ug/L	3.4	**1.7**	36.6	0.15	0.83	17.4	617 J	3.8 JB	7.1	**0.357**	0.88	ND(0.50)	14.2
CML-SW-02	6/15/2011	48.20	ug/L	1.7 J	**1.2 J**	43.5	0.095	0.71 J	14.0 J	420 J	5.1 J	10.4 J	0.0772	0.77	ND(0.50)	7.0
CML-QC-T2 (CML-SW-02)	6/15/2011	48.20	ug/L	1.3 J	**0.8 J**	41.3	ND(0.080)	1.1 J	9.9 J	562 J	1.0 JB	6.8 J	NA*	NA*	ND(0.50)	5.9
CML-SW-03	6/15/2011	2.75	ug/L	1.9	**2.3**	59.1	ND(0.080)	1.2	20.8	1450 J	2.9 JB	8.8	0.123	1.7	ND(0.50)	10.5
CML-SW-04	6/15/2011	46.90	ug/L	ND(0.50)	**0.53**	41.1	ND(0.080)	0.62	3.8	288 J	0.31/ND(0.31)U	4.7	0.0337	0.54	ND(0.50)	ND(5.0)
CML-SW-05	6/15/2011	36.90	ug/L	ND(0.50)	**ND(0.50)**	39.6	ND(0.080)	ND(0.50)	1.0	162 J	0.12/ND(0.12)U	2.5	0.0042	ND(0.50)	ND(0.50)	ND(5.0)
CML-SW-06	6/13/2011	NA*	ug/L	**117**	**36.0**	59.2	1.1	1.0	133	117 J	6.7	**39.1**	**1.91**	3.2	ND(0.50)	**63.1**
CML-SW-07	6/14/2011	NA*	ug/L	42.9	**12.8**	81.7	1.2	1.3	221	1430 J	**49.0**	12.9	**2.52**	2.1	0.64	**40.5**
CML-SW-08	6/15/2011	65.60	ug/L	3.4	**1.7**	37.7	0.12	0.68	16.7	381 J	3.7 JB	5.8	**0.193**	0.72	ND(0.50)	12.5
CML-SW-09	6/15/2011	61.30	ug/L	3.0	**1.4**	36.2	0.13	0.83	15.8	406 J	2.9 JB	6.1	**0.178**	0.84	ND(0.50)	11.8
CML-SW-10	6/15/2011	65.70	ug/L	2.4	**1.2**	37.0	0.12	0.90	13.8	338 J	2.7 JB	5.2	**0.221**	1.6	ND(0.50)	9.4
CML-SW-11	6/15/2011	55.80	ug/L	1.7	**0.90**	42.0	0.090	0.75	11.6	400 J	1.7 JB	5.8	**0.196**	0.77	ND(0.50)	7.2
CML-SW-13	6/15/2011	41.40	ug/L	ND(0.50)	**ND(0.50)**	40.3	ND(0.080)	0.54	2.1	168 J	0.18/ND(0.18)U	3.4	0.006	0.77	ND(0.50)	6.8
CML-SW-14	6/15/2011	45.50	ug/L	ND(0.50)	**0.51**	38.6	ND(0.080)	0.64	3.5	442 J	0.36/ND(0.36)U	8.1	0.0292	0.57	ND(0.50)	ND(5.0)
CML-SW-15	6/15/2011	54.10	ug/L	ND(0.50)	**0.68**	42.5	ND(0.080)	0.64	5.8	321 J	0.61 JB	5.6	0.0336	0.62	ND(0.50)	ND(5.0)
CML-QC-T1 (CML-SW-15)	6/15/2011	54.10	ug/L	ND(0.50)	**0.65**	43.4	ND(0.080)	0.79	6.0	340 J	0.63 JB	5.8	NA*	0.75	ND(0.50)	5.2
CML-SW-16	6/15/2011	48.60	ug/L	1.6	**1.2**	42.8	0.11	0.78	11.8	356 J	5.1	5.5	0.12	0.72	ND(0.50)	6.1
CML-SW-17	6/14/2011	<0.1	ug/L	ND(0.50)	**ND(0.50)**	8.7	ND(0.080)	ND(0.50)	2.4	115	0.13/ND(0.13)U	1.7	0.0056	ND(0.50)	ND(0.50)	12.5
CML-SW-18	6/14/2011	<0.1	ug/L	ND(0.50)	**ND(0.50)**	20.4	ND(0.080)	ND(0.50)	2.0	158	0.27/ND(0.27)U	1.0	0.0071	ND(0.50)	ND(0.50)	ND(5.0)
CML-SW-19	6/15/2011	43.70	ug/L	ND(0.50)	**ND(0.50)**	44.6	ND(0.080)	0.69	3.6	308 J	0.37/ND(0.37)U	4.1	0.0062	0.61	ND(0.50)	ND(5.0)

[a] MT DEQ Risk Based Cleanup Guidelines (RBCG) Composite, Conservative Water Cleanup Guidelines for Recreational Visitors Table 7-11 (DEQ 1996)

[b] Carcinogenic risk of 5E-07

Bold, highlighted values exceed DEQ RBCG values

J – Estimated concentration

JB – Estimated concentration due to blank contamination

U – Evaluated to be undetected at the reporting limit

cfs - cubic feet per second

ug/L = micrograms per liter

NA* - Not applicable or not analyzed

ND() - Analyte was not detected (reporting limit)

TABLE 3-29. SURFACE WATER ANALYTICAL RESULTS - TOTAL RECOVERABLE METALS
CIRCULAR DEQ-7 STANDARDS
COMBINATION MILL AOC
BLACK PINE MINE
HUMAN HEALTH STANDARDS (HHS)

Location	Date Sampled	Discharge (cfs)	Units	Antimony	Arsenic	Barium	Cadmium	Chromium	Copper	Iron	Lead	Manganese	Mercury	Nickel	Silver	Zinc
Circular DEQ-7 HHS[a] (ug/L)				**5.6[d]**	**10[e]**	**1,000[f]**	**5[e]**	**100[e]**	**1,300[d]**	**300[f]**	**15[d]**	**50[f]**	**0.05[d]**	**100[g]**	**100[g]**	**2,000[g]**
CML-SW-01	6/15/2011	76.50	ug/L	3.4	1.7	36.6	0.15	0.83	17.4	**617 J**	3.8 JB	7.1	**0.357**	0.88	ND(0.50)	14.2
CML-SW-02	6/15/2011	48.20	ug/L	1.7 J	1.2 J	43.5	0.095	0.71 J	14.0 J	**420 J**	5.1 J	10.4 J	**0.0772**	0.77	ND(0.50)	7.0
CML-QC-T2 (CML-SW-02)	6/15/2011	48.20	ug/L	1.3 J	0.80 J	41.3	ND(0.080)	1.1 J	9.9 J	**562 J**	1.0 JB	6.8 J	NA*	NA*	ND(0.50)	5.9
CML-SW-03	6/15/2011	2.75	ug/L	1.9	2.3	59.1	ND(0.080)	1.2	20.8	**1450 J**	2.9 JB	8.8	**0.123**	1.7	ND(0.50)	10.5
CML-SW-04	6/15/2011	46.90	ug/L	ND(0.50)	0.53	41.1	ND(0.080)	0.62	3.8	288 J	0.31/ND(0.31)U	4.7	0.0337	0.54	ND(0.50)	ND(5.0)
CML-SW-05	6/15/2011	36.90	ug/L	ND(0.50)	ND(0.50)	39.6	ND(0.080)	ND(0.50)	1.0	162 J	0.12/ND(0.12)U	2.5	0.0042	ND(0.50)	ND(0.50)	ND(5.0)
CML-SW-06	6/13/2011	NA*	ug/L	**117**	**36.0**	59.2	1.1	1.0	133	117 J	6.7	39.1	**1.910**	3.2	ND(0.50)	63.1
CML-SW-07	6/14/2011	NA*	ug/L	**42.9**	**12.8**	81.7	1.2	1.3	221	**1430 J**	**49.0**	12.9	**2.520**	2.1	0.64	40.5
CML-SW-08	6/15/2011	65.60	ug/L	3.4	1.7	37.7	0.12	0.68	16.7	**381 J**	3.7 JB	5.8	**0.193**	0.72	ND(0.50)	12.5
CML-SW-09	6/15/2011	61.30	ug/L	3.0	1.4	36.2	0.13	0.83	15.8	**406 J**	2.9 JB	6.1	**0.178**	0.84	ND(0.50)	11.8
CML-SW-10	6/15/2011	65.70	ug/L	2.4	1.2	37.0	0.12	0.90	13.8	**338 J**	2.7 JB	5.2	**0.221**	1.6	ND(0.50)	9.4
CML-SW-11	6/15/2011	55.80	ug/L	1.7	0.90	42.0	0.090	0.75	11.6	**400 J**	1.7 JB	5.8	**0.196**	0.77	ND(0.50)	7.2
CML-SW-13	6/15/2011	41.40	ug/L	ND(0.50)	ND(0.50)	40.3	ND(0.080)	0.54	2.1	168 J	0.18/ND(0.18)U	3.4	0.0060	0.77	ND(0.50)	6.8
CML-SW-14	6/15/2011	45.50	ug/L	ND(0.50)	0.51	38.6	ND(0.080)	0.64	3.5	**442 J**	0.36/ND(0.36)U	8.1	0.0292	0.57	ND(0.50)	ND(5.0)
CML-SW-15	6/15/2011	54.10	ug/L	ND(0.50)	0.68	42.5	ND(0.080)	0.64	5.8	**321 J**	0.61 JB	5.6	0.0336	0.62	ND(0.50)	ND(5.0)
CML-QC-T1 (CML-SW-15)	6/15/2011	54.10	ug/L	ND(0.50)	0.65	43.4	ND(0.080)	0.79	6.0	**340 J**	0.63 JB	5.8	NA*	0.75	ND(0.50)	5.2
CML-SW-16	6/15/2011	48.60	ug/L	1.6	1.2	42.8	0.11	0.78	11.8	**356 J**	5.1	5.5	**0.120**	0.72	ND(0.50)	6.1
CML-SW-17	6/14/2011	<0.1	ug/L	ND(0.50)	ND(0.50)	8.7	ND(0.080)	ND(0.50)	2.4	115	0.13/ND(0.13)U	1.7	0.0056	ND(0.50)	ND(0.50)	12.5
CML-SW-18	6/14/2011	<0.1	ug/L	ND(0.50)	ND(0.50)	20.4	ND(0.080)	ND(0.50)	2.0	158	0.27/ND(0.27)U	1.0	0.0071	ND(0.50)	ND(0.50)	ND(5.0)
CML-SW-19	6/15/2011	43.70	ug/L	ND(0.50)	ND(0.50)	44.6	ND(0.080)	0.69	3.6	**308 J**	0.37/ND(0.37)U	4.1	0.0062	0.61	ND(0.50)	ND(5.0)

FRESHWATER ACUTE AQUATIC LIFE STANDARDS (AALS)

Location	Date Sampled	Discharge (cfs)	Units	Antimony	Arsenic	Barium	Cadmium	Chromium	Copper	Iron	Lead	Manganese	Mercury	Nickel	Silver	Zinc
Circular DEQ-7 AALS[b] (ug/L)				NS	**340[d]**	NS	**0.52[d,h]**	**579[d,h]**	**3.79[d,h]**	NS	**13.98[d,h]**	NS	**1.7[d]**	**145[d,h]**	**0.374[d,h]**	**37[d,h]**
CML-SW-01	6/15/2011	76.50	ug/L	3.4	1.7	36.6	0.15	0.83	**17.4**	617 J	3.8 JB	7.1	0.357	0.88	**ND(0.50)**	14.2
CML-SW-02	6/15/2011	48.20	ug/L	1.7 J	1.2 J	43.5	0.095	0.71 J	**14.0 J**	420 J	5.1 J	10.4 J	0.0772	0.77	**ND(0.50)**	7.0
CML-QC-T2 (CML-SW-02)	6/15/2011	48.20	ug/L	1.3 J	0.80 J	41.3	ND(0.080)	1.1 J	**9.9 J**	562 J	1.0 JB	6.8 J	NA*	NA*	**ND(0.50)**	5.9
CML-SW-03	6/15/2011	2.75	ug/L	1.9	2.3	59.1	ND(0.080)	1.2	**20.8**	1450 J	2.9 JB	8.8	0.123	1.7	**ND(0.50)**	10.5
CML-SW-04	6/15/2011	46.90	ug/L	ND(0.50)	0.53	41.1	ND(0.080)	0.62	**3.8**	288 J	0.31/ND(0.31)U	4.7	0.0337	0.54	**ND(0.50)**	ND(5.0)
CML-SW-05	6/15/2011	36.90	ug/L	ND(0.50)	ND(0.50)	39.6	ND(0.080)	ND(0.50)	1.0	162 J	0.12/ND(0.12)U	2.5	0.0042	ND(0.50)	**ND(0.50)**	ND(5.0)
CML-SW-06	6/13/2011	NA*	ug/L	117	36.0	59.2	**1.1**	1.0	**133**	117 J	6.7	39.1	**1.910**	3.2	**ND(0.50)**	**63.1**
CML-SW-07	6/14/2011	NA*	ug/L	42.9	12.8	81.7	**1.2**	1.3	**221**	1430 J	**49.0**	12.9	**2.520**	2.1	**0.64**	**40.5**
CML-SW-08	6/15/2011	65.60	ug/L	3.4	1.7	37.7	0.12	0.68	**16.7**	381 J	3.7 JB	5.8	0.193	0.72	**ND(0.50)**	12.5
CML-SW-09	6/15/2011	61.30	ug/L	3.0	1.4	36.2	0.13	0.83	**15.8**	406 J	2.9 JB	6.1	0.178	0.84	**ND(0.50)**	11.8
CML-SW-10	6/15/2011	65.70	ug/L	2.4	1.2	37.0	0.12	0.90	**13.8**	338 J	2.7 JB	5.2	0.221	1.6	**ND(0.50)**	9.4
CML-SW-11	6/15/2011	55.80	ug/L	1.7	0.90	42.0	0.090	0.75	**11.6**	400 J	1.7 JB	5.8	0.196	0.77	**ND(0.50)**	7.2
CML-SW-13	6/15/2011	41.40	ug/L	ND(0.50)	ND(0.50)	40.3	ND(0.080)	0.54	2.1	168 J	0.18/ND(0.18)U	3.4	0.0060	0.77	**ND(0.50)**	6.8
CML-SW-14	6/15/2011	45.50	ug/L	ND(0.50)	0.51	38.6	ND(0.080)	0.64	3.5	442 J	0.36/ND(0.36)U	8.1	0.0292	0.57	**ND(0.50)**	ND(5.0)
CML-SW-15	6/15/2011	54.10	ug/L	ND(0.50)	0.68	42.5	ND(0.080)	0.64	**5.8**	321 J	0.61 JB	5.6	0.0336	0.62	**ND(0.50)**	ND(5.0)
CML-QC-T1 (CML-SW-15)	6/15/2011	54.10	ug/L	ND(0.50)	0.65	43.4	ND(0.080)	0.79	**6.0**	340 J	0.63 JB	5.8	NA*	0.75	**ND(0.50)**	5.2
CML-SW-16	6/15/2011	48.60	ug/L	1.6	1.2	42.8	0.11	0.78	**11.8**	356 J	5.1	5.5	0.120	0.72	**ND(0.50)**	6.1
CML-SW-17	6/14/2011	<0.1	ug/L	ND(0.50)	ND(0.50)	8.7	ND(0.080)	ND(0.50)	2.4	115	0.13/ND(0.13)U	1.7	0.0056	ND(0.50)	**ND(0.50)**	12.5
CML-SW-18	6/14/2011	<0.1	ug/L	ND(0.50)	ND(0.50)	20.4	ND(0.080)	ND(0.50)	2.0	158	0.27/ND(0.27)U	1.0	0.0071	ND(0.50)	**ND(0.50)**	ND(5.0)
CML-SW-19	6/15/2011	43.70	ug/L	ND(0.50)	ND(0.50)	44.6	ND(0.080)	0.69	3.6	308 J	0.37/ND(0.37)U	4.1	0.0062	0.61	**ND(0.50)**	ND(5.0)

TABLE 3-29. SURFACE WATER ANALYTICAL RESULTS - TOTAL RECOVERABLE METALS
CIRCULAR DEQ-7 STANDARDS
COMBINATION MILL AOC
BLACK PINE MINE

FRESHWATER CHRONIC AQUATIC LIFE STANDARDS (CALS)

Location	Date Sampled	Discharge (cfs)	Units	Antimony	Arsenic	Barium	Cadmium	Chromium	Copper	Iron	Lead	Manganese	Mercury	Nickel	Silver	Zinc
Circular DEQ-7 CALS[c] (ug/L)				**NS**	**150[d]**	**NS**	**0.097[d,h]**	**27.7[d,h]**	**2.85[d,h]**	**1,000[i]**	**0.545[d,h]**	**NS**	**0.91[d]**	**16.1[d,h]**	**NS**	**37[d,h]**
CML-SW-01	6/15/2011	76.50	ug/L	3.4	1.7	36.6	**0.15**	0.83	**17.4**	617 J	**3.8 JB**	7.1	0.357	0.88	ND(0.50)	14.2
CML-SW-02	6/15/2011	48.20	ug/L	1.7 J	1.2 J	43.5	0.095	0.71 J	**14.0 J**	420 J	**5.1 J**	10.4 J	0.0772	0.77	ND(0.50)	7.0
CML-QC-T2 (CML-SW-02)	6/15/2011	48.20	ug/L	1.3 J	0.8 J	41.3	ND(0.080)	1.1 J	**9.9 J**	562 J	**1.0 JB**	6.8 J	NA*	NA*	ND(0.50)	5.9
CML-SW-03	6/15/2011	2.75	ug/L	1.9	2.3	59.1	ND(0.080)	1.2	**20.8**	**1450 J**	**2.9 JB**	8.8	0.123	1.7	ND(0.50)	10.5
CML-SW-04	6/15/2011	46.90	ug/L	ND(0.50)	0.53	41.1	ND(0.080)	0.62	**3.8**	288 J	0.31/ND(0.31)U	4.7	0.0337	0.54	ND(0.50)	ND(5.0)
CML-SW-05	6/15/2011	36.90	ug/L	ND(0.50)	ND(0.50)	39.6	ND(0.080)	ND(0.50)	1.0	162 J	0.12/ND(0.12)U	2.5	0.0042	ND(0.50)	ND(0.50)	ND(5.0)
CML-SW-06	6/13/2011	NA*	ug/L	117	36.0	59.2	**1.1**	1.0	**133**	117 J	**6.7**	39.1	**1.910**	3.2	ND(0.50)	**63.1**
CML-SW-07	6/14/2011	NA*	ug/L	42.9	12.8	81.7	**1.2**	1.3	**221**	**1430 J**	**49.0**	12.9	**2.520**	2.1	0.64	**40.5**
CML-SW-08	6/15/2011	65.60	ug/L	3.4	1.7	37.7	**0.12**	0.68	**16.7**	381 J	**3.7 JB**	5.8	0.193	0.72	ND(0.50)	12.5
CML-SW-09	6/15/2011	61.30	ug/L	3.0	1.4	36.2	**0.13**	0.83	**15.8**	406 J	**2.9 JB**	6.1	0.178	0.84	ND(0.50)	11.8
CML-SW-10	6/15/2011	65.70	ug/L	2.4	1.2	37.0	**0.12**	0.90	**13.8**	338 J	**2.7 JB**	5.2	0.221	1.6	ND(0.50)	9.4
CML-SW-11	6/15/2011	55.80	ug/L	1.7	0.90	42.0	0.090	0.75	**11.6**	400 J	**1.7 JB**	5.8	0.196	0.77	ND(0.50)	7.2
CML-SW-13	6/15/2011	41.40	ug/L	ND(0.50)	ND(0.50)	40.3	ND(0.080)	0.54	2.1	168 J	0.18/ND(0.18)U	3.4	0.0060	0.77	ND(0.50)	6.8
CML-SW-14	6/15/2011	45.50	ug/L	ND(0.50)	0.51	38.6	ND(0.080)	0.64	**3.5**	442 J	0.36/ND(0.36)U	8.1	0.0292	0.57	ND(0.50)	ND(5.0)
CML-SW-15	6/15/2011	54.10	ug/L	ND(0.50)	0.68	42.5	ND(0.080)	0.64	**5.8**	321 J	**0.61 JB**	5.6	0.0336	0.62	ND(0.50)	ND(5.0)
CML-QC-T1 (CML-SW-15)	6/15/2011	54.10	ug/L	ND(0.50)	0.65	43.4	ND(0.080)	0.79	**6.0**	340 J	**0.63 JB**	5.8	NA*	0.75	ND(0.50)	5.2
CML-SW-16	6/15/2011	48.60	ug/L	1.6	1.2	42.8	**0.11**	0.78	**11.8**	356 J	**5.1**	5.5	0.120	0.72	ND(0.50)	6.1
CML-SW-17	6/14/2011	<0.1	ug/L	ND(0.50)	ND(0.50)	8.7	ND(0.080)	ND(0.50)	2.4	115	0.13/ND(0.13)U	1.7	0.0056	ND(0.50)	ND(0.50)	12.5
CML-SW-18	6/14/2011	<0.1	ug/L	ND(0.50)	ND(0.50)	20.4	ND(0.080)	ND(0.50)	2.0	158	0.27/ND(0.27)U	1.0	0.0071	ND(0.50)	ND(0.50)	ND(5.0)
CML-SW-19	6/15/2011	43.70	ug/L	ND(0.50)	ND(0.50)	44.6	ND(0.080)	0.69	**3.6**	308 J	0.37/ND(0.37)U	4.1	0.0062	0.61	ND(0.50)	ND(5.0)

[a] Human Health Standards (HHS) for Water, Circular DEQ-7, Montana Numeric Water Quality Standards (DEQ 2010)
[b] Freshwater Acute Aquatic Life Standards (AALS), Circular DEQ-7, Montana Numeric Water Quality Standards (DEQ 2010)
[c] Freshwater Chronic Aquatic Life Standards (CALS), Circular DEQ-7, Montana Numeric Water Quality Standards (DEQ 2010)
[d] Priority Pollutant, Circular DEQ-7, Montana Numeric Water Quality Standards (DEQ 2010)
[e] Maximum Contaminant Level, Circular DEQ-7, Montana Numeric Water Quality Standards (DEQ 2010)
[f] Secondary Maximum Contaminant Level based on aesthetic properties, Circular DEQ-7, Montana Numeric Water Quality Standards (DEQ 2010)
[g] Health Advisory, Circular DEQ-7, Montana Numeric Water Quality Standards (DEQ 2010)
[h] @ 25 mg/L hardness, Circular DEQ-7, Montana Numeric Water Quality Standards (DEQ 2010)
[i] Non-Priority Pollutant, Circular DEQ-7, Montana Numeric Water Quality Standards (DEQ 2010)

Bold, highlighted values exceed respective standards
J – Estimated concentration
JB – Estimated concentration due to blank contamination
cfs - cubic feet per second
ug/L = micrograms per liter
NA* - Not applicable or not analyzed
ND() - Analyte was not detected (reporting limit)
NS - A standard has not been adopted

TABLE 3-30. INSTANTANEOUS METALS LOADING RATES
SOUTH FORK LOWER WILLOW CREEK
COMBINATION MILL AOC
BLACK PINE MINE

Location	Date Sampled	Discharge (cfs)	Units	Antimony[a]	Arsenic[a]	Barium[a]	Cadmium[a]	Chromium[a]	Copper[a]	Iron[a]	Lead[a]	Manganese[a]	Mercury[a]	Nickel[a]	Silver[a]	Zinc[a]
CML-SW-05	6/15/2011	36.9	mg/s	0.3	0.3	41.4	0.0	0.3	1.0	169.2	0.1	2.6	0.004	0.3	0.3	0.3
CML-SW-13	6/15/2011	41.4	mg/s	0.3	0.3	47.2	0.0	0.6	2.5	196.8	0.1	4.0	0.007	0.9	0.3	8.0
CML-SW-19	6/15/2011	43.7	mg/s	0.3	0.3	55.2	0.0	0.9	4.5	380.9	0.2	5.1	0.008	0.8	0.3	0.3
CML-SW-04	6/15/2011	46.9	mg/s	0.3	0.7	54.6	0.1	0.8	5.0	382.3	0.2	6.2	0.045	0.7	0.3	0.3
CML-SW-14	6/15/2011	45.5	mg/s	0.3	0.7	49.7	0.1	0.8	4.5	569.1	0.2	10.4	0.038	0.7	0.3	0.3
CML-SW-03	6/15/2011	2.75	mg/s	0.1	0.2	4.6	0.0	0.1	1.6	112.8	0.2	0.7	0.010	0.1	0.0	0.8
CML-SW-15	6/15/2011	54.1	mg/s	0.4	1.0	65.1	0.1	1.0	9.2	491.5	0.9	8.6	0.051	0.9	0.4	8.0
CML-SW-02	6/15/2011	48.2	mg/s	2.3	1.1	59.3	0.1	1.0	13.5	572.9	1.4	14.2	0.105	1.1	0.3	8.0
CML-SW-16	6/15/2011	48.6	mg/s	2.2	1.7	58.9	0.2	1.1	16.2	489.6	7.0	7.6	0.165	1.0	0.3	8.4
CML-SW-17	6/14/2011	<0.1	mg/s	0.001	0.001	0.025	0.000	0.001	0.007	0.325	0.000	0.005	0.000	0.001	0.001	0.035
CML-SW-11	6/15/2011	55.8	mg/s	2.7	1.4	66.3	0.1	1.2	18.3	631.7	2.7	9.2	0.310	1.2	0.4	11.4
CML-SW-10	6/15/2011	65.7	mg/s	4.5	2.2	68.8	0.2	1.7	25.7	628.4	5.0	9.7	0.411	3.0	0.5	17.5
CML-SW-09	6/15/2011	61.3	mg/s	5.2	2.4	62.8	0.2	1.4	27.4	704.3	5.0	10.6	0.309	1.5	0.4	20.5
CML-SW-18	6/14/2011	<0.1	mg/s	0.001	0.001	0.058	0.000	0.001	0.006	0.447	0.000	0.003	0.000	0.001	0.001	0.001
CML-SW-08	6/15/2011	65.6	mg/s	6.3	3.2	70.0	0.2	1.3	31.0	707.3	6.9	10.8	0.358	1.3	0.5	23.2
CML-SW-01	6/15/2011	76.5	mg/s	7.4	3.7	79.2	0.3	1.8	37.7	1,335.8	8.2	15.4	0.773	1.9	0.5	30.7
TSP-6	6/14/2011	4.5	mg/s	0.1	0.1	10.9	0.01	0.2	2.9	127.4	0.1	1.1	0.002	0.3	0.03	1.0

[a] Instantaneous loading rate calculated as concentration multiplied by the flow rate. For non-detect values, one half of the reporting limit was used as the concentration.

cfs - cubic feet per second

mg/s - milligrams per second

NA* - Not applicable or not analyzed

TABLE 3-31. HISTORICAL SURFACE WATER ANALYTICAL RESULTS - METALS
COMBINATION MILL AOC
BLACK PINE MINE

Location	Date Sampled	Metals Analysis[c]	Units	Antimony	Arsenic	Cadmium	Copper	Iron	Lead	Manganese	Mercury	Silver	Zinc
Risk Based Cleanup Guidelines[a] (ug/L)				**91.1**	**0.06[b]**	**66.5**	**472**	**4,979**	**47.1**	**16.6**	**0.15**	**NS**	**17.2**
12	7/21/1981	Total	ug/L	NA*	**ND(5)**	ND(1)	ND(10)	270.0	ND(10)	**ND(20)**	ND(0.2)	ND(5)	ND(10)
22	7/17/1981	Total	ug/L	NA*	**ND(5)**	ND(1)	ND(10)	60.00	ND(10)	**ND(20)**	**1.10**	ND(5)	**40.00**
1A	8/28/1991	Dissolved	ug/L	NA*	**ND(5)**	ND(1)	10.00	30.00	ND(10)	**ND(20)**	**ND(1)**	ND(5)	ND(10)
BP-3A	9/13/1990	Total	ug/L	NA*	**ND(40)**	ND(4)	50.00	266.0	ND(30)	**38.00**	**1.15**	ND(5)	ND(20)
BP-1A	9/13/1990	Total	ug/L	NA*	**ND(40)**	ND(4)	ND(15)	239.0	ND(30)	**55.00**	ND(0.15)	ND(5)	ND(20)
BP-2A	9/13/1990	Total	ug/L	NA*	**ND(40)**	ND(4)	ND(15)	292.0	ND(30)	**52.00**	**0.3100**	ND(5)	ND(20)
SW-1	7/21/1993	Total	ug/L	ND(30.7)	**3.25**	ND(2.57)	21.90	410.0	9.93	**20.90**	0.0810	NA*	ND(7.57)
SW-1	10/19/1995	Total	ug/L	9.30	**2.70**	0.20	23.60	84.00	2.70	15.70	**0.4800**	0.5200	**26.10**
SW-2	7/21/1993	Total	ug/L	ND(30.7)	**2.40**	ND(2.57)	17.20	1,280	3.30	**17.40**	ND(0.038)	NA*	ND(7.57)
SW-2	10/19/1995	Total	ug/L	8.80	**2.30**	0.16	25.00	172.0	4.00	**16.80**	**0.5000**	ND(0.21)	**29.40**
SW-3	7/21/1993	Total	ug/L	ND(30.7)	**ND(1.69)**	ND(2.57)	1.90	264.0	ND(1.55)	15.60	ND(0.038)	NA*	ND(7.57)
SW-3	10/19/1995	Total	ug/L	5.00	**1.80**	0.16	24.00	153.0	3.00	**17.90**	**0.4600**	0.5700	**22.80**
SW-4	10/19/1995	Total	ug/L	2.40	**ND(1.5)**	0.07	16.50	160.0	1.00	**17.90**	**0.2200**	0.4800	ND(9.1)
MCSW-1	10/4/2000	Total	ug/L	ND(50)	**ND(3)**	ND(0.1)	24.00	500.0	8.00	**120.0**	**ND(0.6)**	ND(3)	10.00
MCSW-1	6/7/2001	Total	ug/L	ND(50)	**ND(3)**	0.10	25.00	2,150	6.00	**20.00**	NA*	ND(3)	**30.00**
MCSW-1	7/18/2001	Total	ug/L	ND(50)	**ND(3)**	ND(0.1)	18.00	1,350	5.00	**20.00**	NA*	ND(3)	10.00
WCSW-1	10/4/2000	Total	ug/L	ND(50)	**ND(3)**	ND(5)	2.00	110.0	ND(3)	**30.00**	**ND(0.6)**	3.00	10.00
WCSW-1	6/7/2001	Total	ug/L	ND(50)	**ND(3)**	ND(0.1)	ND(5)	330.0	ND(3)	ND(10)	NA*	ND(3)	ND(10)
WCSW-1	7/18/2001	Total	ug/L	ND(50)	**ND(3)**	ND(0.1)	3.00	140.0	ND(3)	**20.00**	NA*	ND(3)	ND(10)
SFLWILLOWC02	9/1/2007	Total	ug/L	10.00	**5.00**	0.16	12.00	110.0	3.00	10.00	NA*	ND(1)	**20.10**
SFLWILLOWC02	6/9/2008	Total	ug/L	ND(5)	**ND(3)**	0.14	18.00	480.0	3.80	7.00	NA*	NA*	**20.00**
SFLWILLOWC02	7/10/2008	Total	ug/L	10.00	**5.00**	0.10	20.00	210.0	5.50	NA*	NA*	NA*	**20.00**
SFLWILLOWC02	8/11/2008	Total	ug/L	11.00	**7.00**	0.12	15.00	160.0	4.60	NA*	NA*	NA*	**20.00**
SFLWILLOWC02	5/27/2009	Total	ug/L	17.00	**7.00**	1.15	40.00	490.0	30.80	NA*	NA*	NA*	**20.00**
SFLWILLOWC02	8/20/2009	Total	ug/L	13.00	**7.00**	ND(0.08)	17.00	190.0	6.10	NA*	NA*	NA*	10.00
SFLWILLOWC03	7/8/2008	Total	ug/L	5.00	**ND(3)**	0.16	17.00	190.0	2.20	NA*	NA*	NA*	**20.00**
SFLWILLOWC03	8/11/2008	Total	ug/L	8.00	**4.00**	0.20	18.00	60.00	1.80	NA*	NA*	NA*	**20.00**
SFLWILLOWC03	5/27/2009	Total	ug/L	8.00	**3.00**	1.02	22.00	260.0	13.60	NA*	NA*	NA*	ND(10)
SFLWILLOWC03	8/20/2009	Total	ug/L	9.00	**4.00**	0.10	19.00	70.00	2.30	NA*	NA*	NA*	**20.00**
CML-SW-01	6/15/2011	Total Recoverable	ug/L	3.40	**1.70**	0.15	17.40	617.0	3.80	7.10	**0.3570**	ND(0.5)	14.20
SFLWILLOWC04	9/1/2007	Total	ug/L	3.00	**2.00**	0.12	19.00	100.0	0.80	7.00	NA*	ND(1)	7.10
SFLWILLOWC04	7/8/2008	Total	ug/L	ND(5)	**ND(3)**	0.15	13.00	230.0	1.80	NA*	NA*	NA*	**30.00**
SFLWILLOWC04	8/11/2008	Total	ug/L	ND(5)	**ND(3)**	0.16	15.00	100.0	2.40	NA*	NA*	NA*	**20.00**
SFLWILLOWC04	5/27/2009	Total	ug/L	ND(3)	**ND(3)**	1.94	6.00	220.0	1.40	NA*	NA*	NA*	ND(10)
SFLWILLOWC04	8/20/2009	Total	ug/L	5.00	**ND(3)**	ND(0.08)	16.00	100.0	1.60	NA*	NA*	NA*	10.00
CML-SW-02	6/15/2011	Total Recoverable	ug/L	1.30	**1.20**	ND(0.08)	9.90	420.0	1.00	10.40	0.0772	ND(0.5)	7.00
SFLWILLOWC04.5	7/8/2008	Total	ug/L	ND(5)	**ND(3)**	0.11	21.00	1,080	3.40	NA*	NA*	NA*	**20.00**
SFLWILLOWC04.5	8/11/2008	Total	ug/L	ND(5)	**4.00**	0.11	20.00	970.0	3.70	NA*	NA*	NA*	10.00
SFLWILLOWC04.5	5/27/2009	Total	ug/L	3.00	**ND(3)**	0.89	20.00	1,370	3.10	NA*	NA*	NA*	ND(10)
CML-SW-03	6/15/2011	Total Recoverable	ug/L	1.90	**2.30**	ND(0.08)	20.80	1,450	2.90	8.80	0.1230	ND(0.5)	10.50

TABLE 3-31. HISTORICAL SURFACE WATER ANALYTICAL RESULTS - METALS
COMBINATION MILL AOC
BLACK PINE MINE

Location	Date Sampled	Metals Analysis[c]	Units	Antimony	Arsenic	Cadmium	Copper	Iron	Lead	Manganese	Mercury	Silver	Zinc
Risk Based Cleanup Guidelines[a] (ug/L)				**91.1**	**0.06[b]**	**66.5**	**472**	**4,979**	**47.1**	**16.6**	**0.15**	**NS**	**17.2**
SFLWILLOWC05	7/8/2008	Total	ug/L	ND(5)	**ND(3)**	ND(0.08)	1.00	170.0	ND(0.5)	NA*	NA*	NA*	ND(10)
SFLWILLOWC05	8/11/2008	Total	ug/L	ND(5)	**ND(3)**	ND(0.08)	1.00	100.0	ND(0.5)	NA*	NA*	NA*	ND(10)
SFLWILLOWC05	5/27/2009	Total	ug/L	ND(3)	**ND(3)**	1.48	2.00	170.0	ND(0.5)	NA*	NA*	NA*	ND(10)
SFLWILLOWC05	8/18/2009	Total	ug/L	ND(3)	**ND(3)**	ND(0.08)	1.00	130.0	ND(0.5)	NA*	NA*	NA*	ND(10)
CML-SW-04	6/15/2011	Total Recoverable	ug/L	ND(0.5)	**0.53**	ND(0.08)	3.80	288.0	0.31/ND(0.31)	4.70	0.0337	ND(0.5)	ND(5)
CML-SW-05	6/15/2011	Total Recoverable	ug/L	ND(0.5)	**ND(0.5)**	ND(0.08)	1.00	162.0	0.12/ND(0.12)	2.50	0.0042	ND(0.5)	ND(5)
CML-SW-06	6/13/2011	Total Recoverable	ug/L	**117.0**	**36.00**	1.10	133.0	117.0	6.70	**39.10**	**1.91**	ND(0.5)	**63.10**
CML-SW-07	6/14/2011	Total Recoverable	ug/L	42.90	**12.80**	1.20	221.0	1,430	**49.00**	12.90	**2.52**	0.6400	**40.50**
CML-SW-08	6/15/2011	Total Recoverable	ug/L	3.40	**1.70**	0.12	16.70	381.0	3.70	5.80	**0.1930**	ND(0.5)	12.50
CML-SW-09	6/15/2011	Total Recoverable	ug/L	3.00	**1.40**	0.13	15.80	406.0	2.90	6.10	**0.1780**	ND(0.5)	11.80
CML-SW-10	6/15/2011	Total Recoverable	ug/L	2.40	**1.20**	0.12	13.80	338.0	2.70	5.20	**0.2210**	ND(0.5)	9.40
CML-SW-11	6/15/2011	Total Recoverable	ug/L	1.70	**0.90**	0.09	11.60	400.0	1.70	5.80	**0.1960**	ND(0.5)	7.20
CML-SW-13	6/15/2011	Total Recoverable	ug/L	ND(0.5)	**ND(0.5)**	ND(0.08)	2.10	168.0	0.18/ND(0.18)	3.40	0.0060	ND(0.5)	6.80
CML-SW-14	6/15/2011	Total Recoverable	ug/L	ND(0.5)	**0.51**	ND(0.08)	3.50	442.0	0.36/ND(0.36)	8.10	0.0292	ND(0.5)	ND(5)
CML-SW-15	6/15/2011	Total Recoverable	ug/L	ND(0.5)	**0.68**	ND(0.08)	5.80	321.0	0.61	5.60	0.0336	ND(0.5)	ND(5)
CML-SW-16	6/15/2011	Total Recoverable	ug/L	1.60	**1.20**	0.11	11.80	356.0	5.10	5.50	0.1200	ND(0.5)	6.10
CML-SW-17	6/14/2011	Total Recoverable	ug/L	ND(0.5)	**ND(0.5)**	ND(0.08)	2.40	115.0	0.13/ND(0.13)	1.70	0.0056	ND(0.5)	12.50
CML-SW-18	6/14/2011	Total Recoverable	ug/L	ND(0.5)	**ND(0.5)**	ND(0.08)	2.00	158.0	0.27/ND(0.27)	1.00	0.0071	ND(0.5)	ND(5)
CML-SW-19	6/15/2011	Total Recoverable	ug/L	ND(0.5)	**ND(0.5)**	ND(0.08)	3.60	308.0	0.37/ND(0.37)	4.10	0.0062	ND(0.5)	ND(5)

[a] MT DEQ Risk Based Cleanup Guidelines (RBCG) Composite, Conservative Water Cleanup Guidelines for Recreational Visitors Table 7-11 (DEQ 1996)

[b] Carcinogenic risk of 5E-07

[c] For samples where both dissolved and total metals analysis were performed, the result shown is for the total metals analysis.

Bold values exceed DEQ RBCG values

Shading indicates relative concentrations values, dark represents higher relative concentrations

J, JB, and U qualifiers not shown, refer to Table 3-26 for qualifiers on 2011 data

ug/L = micrograms per liter

NA* - Not Applicable or not analyzed

ND() - Analyte was not detected (reporting limit)

NS - A standard has not been adopted

TABLE 3-32. BUILDING MATERIAL ANALYTICAL RESULTS - TOTAL RECOVERABLE METALS
COMBINATION MILL AOC
BLACK PINE MINE

Location	Date Sampled	Units	Arsenic (D004)[a]	Barium (D005)[a]	Cadmium (D006)[a]	Chromium (D007)[a]	Lead (D008)[a]	Mercury (D009)[a]	Selenium (D010)[a]	Silver (D011)[a]
Regulatory Limit for Toxicity Characteristic (TCLP)			**5.0**	**100**	**1.0**	**5.0**	**5.0**	**0.2**	**1.0**	**5.0**
20 Times Rule (ppm)[c]			***100***	***2000***	***20***	***100***	***100***	***4.0***	***20***	***100***
CML-RCRA-01	8/17/2011	mg/kg	63.3	197	0.62	54.1	**164**	0.51	ND(0.48)	3.3
CML-RCRA-02	8/17/2011	mg/kg	**680**	191	14.9	1.6	**2640**	**5.0**	0.56	59.7
CML-RCRA-03	8/17/2011	mg/kg	12.7	19.5	0.88	ND(0.49)	**151**	**4.4**	ND(0.49)	8.2
CML-RCRA-04	8/17/2011	mg/kg	**138**	547	1.7	33.0	**222**	1.7	ND(0.37)	9

[a] Value in parenthesis represents Environmental Protection Agency (EPA) Hazardous Waste Number

[b] Cleanup value from 40 CFR 261.24 based on TCLP analysis. TCLP analysis was not performed on samples. Analytical values represent total recoverable metals concentrations.

[c] If the results of total metals analysis is less than 20 times the regulatory limit the material is not hazardous

Bold, higlighted values exceed 20 times the regulatory limit

J – Estimated concentration

mg/kg - milligrams per kilogram.

ND() - Analyte was not detected (reporting limit)

ppm - parts per million (mg/kg, mg/L)

TCLP - Toxicity Characteristic Leaching Procedure

TABLE 4-2. AGRICULTURAL ANALYSES OF SOIL
REPOSITORY SOIL SAMPLES
BLACK PINE MINE

Location	Date Sampled	Sample Start Depth (ft)	Sample End Depth (ft)	pH, Saturated Paste	pH, SMP Buffer	Organic Matter	Nitrogen, Nitrate	Available Phosphorous	Total Potassium	Cation Exchange Capacity	Specific Conductance, Saturated Paste
			Units	Std Units	Std Units	%	mg/kg	mg/kg	mg/kg	meq/100g	mmhos/cm
RY-SS-01	7/12/2011	0	1	7.1	6.3	3.3	ND(5)	18.1	ND(277)	32.3	0.17 J
RY-SS-02	7/12/2011	0	1	7.8	7	8.7	ND(5)	22	ND(568)	49.8	0.33 J
RY-SS-02	7/12/2011	2	4	7	5.8	3.4	ND(5)	14.7	ND(124)	35.5	0.12 J
RY-SS-03	7/12/2011	0	1	7	6.8	0.35	ND(5)	7.1	ND(174)	14.1	0.067 J
RY-SS-04	7/12/2011	0	1	7	6.2	3.1	ND(5)	5.3	ND(180)	21.1	0.14 J
RY-SS-04	7/12/2011	2	4	5.8	6.8	0.15	ND(5)	3.2	ND(334)	13.5	0.1 J
RY-SS-05	7/12/2011	0	1	7.3	6.1	5.6	ND(5)	10.2	294	34.2	0.19 J
RY-SS-05	7/12/2011	2	4	7.1	7	0.8	ND(5)	1.1	ND(118)	13.8	0.17 J
MW-RY-08	8/17/2011	0	0.5	7.5	7	2.4	ND(5)	2.8	86 J	11.2	0.27
CML-SS-11	7/15/2011	1	3	6.9	6.8	0.81	ND(5)	ND(1)	ND(120)	14.7	0.2 J

J – Estimated concentration

ft - feet

meq/100g - milliequivalents per hundred grams

mg/kg - milligrams per kilogram

mmhos/cm - micromhos per centimeter

% - percent

ND() - Analyte was not detected (reporting limit)

Std Units - Standard Units

t/1000t - tons per thousand tons

TABLE 7-2. SOLID-MATRIX ANALYTICAL RESULTS - TOTAL RECOVERABLE METALS
REPOSITORY
BLACK PINE MINE

Location	Date Sampled	Sample Start Depth (ft)	Sample End Depth (ft)	Units	Antimony	Arsenic	Barium	Cadmium	Chromium	Cobalt	Copper	Lead	Manganese	Mercury	Nickel	Zinc	Iron	Silver
Risk Based Cleanup Guidelines[a] (mg/kg)					**293**	**40.4[bc]**	**4,975**	**19.5[b]**	**735,000**	**30,500**	**27,100**	**1,100**	**665**	**220**	**14,650**	**220,000**	**NS**	**NS**
RY-SS-01	7/12/2011	0	1	mg/kg	0.48	4.0	284	0.093	6.8	4.3	5.1	6.8	327	0.025 J	13.6	36.8	11800	ND(0.37)
RY-SS-02	7/12/2011	0	1	mg/kg	0.60	7.2	248	0.31	4.4	3.3	5.7	5.4	**782**	0.14 J	8.5	42.7	6090	ND(0.45)
RY-SS-02	7/12/2011	2	4	mg/kg	0.50	7.8	239	ND(0.078)	12.9	5.1	8.9	11.8	192	ND(0.024) UJ	13.0	36.9	20400	ND(0.49)
RY-SS-03	7/12/2011	0	1	mg/kg	2.4	8.4	202	0.14	10.1	8.7	12.9	20.4	399	0.062 J	12.0	37.2	17900	ND(0.55)
RY-SS-03	7/12/2011	12	14	mg/kg	1.8	11.3	132	0.089	5.1	4.7	7.6	12.9	153	0.069 J	6.7	15.9	13000	ND(0.38)
RY-SS-04	7/12/2011	0	1	mg/kg	158	**74.7**	247	2.4	3.4	4.0	82.5	1030	**1300**	ND(0.021) UJ	8.3	141	16000	2.7
RY-SS-04	7/12/2011	2	4	mg/kg	68.3	**78.6**	161	1.4	2.2	9.7	209	751	**992**	0.33 J	7.1	134	17400	5.6
RY-SS-04	7/12/2011	9	11	mg/kg	36.7	33.2	96.4	0.72	5.2	6.8	123	256	362	0.18 J	10.8	104	12600	2.6
RY-SS-05	7/12/2011	0	1	mg/kg	2.0	11.1	285	1.0	6.2	5.1	12.6	27.9	**1040**	ND(0.019) UJ	12.2	85.3	11800	ND(0.49)
RY-SS-05	7/12/2011	2	4	mg/kg	0.89	6.8	116	0.23	10.1	4.8	7.5	15.3	223	ND(0.022) UJ	11.2	49.9	13000	ND(0.47)
MW-RY-06	8/16/2011	0	0.5	mg/kg	5.5	13.1	122	0.58	13.2	7.8 J	219	45.6	384	0.026	12.3	53.9	13300	1.5
MW-RY-06	8/16/2011	4	5	mg/kg	0.86	7.9	105	0.46	17.9	4.6 J	310	11.2	110	0.097	15.0	57.4	19300	ND(0.56)
MW-RY-07	8/17/2011	0	0.5	mg/kg	0.98	7.2	216	0.20	7.6	8.1 J	6.4	13.7	**1840**	0.037	9.6	32.0	9880	ND(0.48)
MW-RY-07	8/17/2011	10	11	mg/kg	1.1	8.3	114	ND(0.078)	14.1	15.9 J	16.4	15.8	216	0.065	14.9	27.2	17300	ND(0.49)
MW-RY-08	8/17/2011	0	0.5	mg/kg	19.3	**52.1**	90.2	0.35	3.6	1.7 J	70.7	217	146	0.020	4.4	129	9240	0.83
CML-SS-11	7/15/2011	1	3	mg/kg	0.63	6.1	116	0.079	10.9	3.3	9.6	12.1	224	0.023 J	6.0	22.8	19300	ND(0.49)
CML-SS-11	7/15/2011	8	10	mg/kg	0.49	6.2	109	0.15	16.7	7.4	11.0	12.0	374	6.8 J	8.7	54.7	28300	ND(0.46)

[a] MT DEQ Risk Based Cleanup Guidelines (RBCG) Composite, Conservative Soil Cleanup Guidelines for Recreational Visitors Table 7-10 (DEQ 1996)

[b] Carcinogenic risk of 5E-07

[c] UCL = 95th upper confidence limit on the arithmetic mean background concentration, from background samples

Bold, highlighted values exceed DEQ RBCG values

J – Estimated concentration

UJ – Estimated reporting limit

ft - feet

mg/kg - milligrams per kilogram.

NA* - Not applicable or not analyzed

ND() - Analyte was not detected (reporting limit)

NS - A standard has not been adopted

TABLE 7-3. ACID BASE ACCOUNTING RESULTS
REPOSITORY
BLACK PINE MINE

Location	Date Sampled	Sample Start Depth (ft)	Sample End Depth (ft)	Acid Base Potential** (t/1000t)	Acid Potential (t/1000t)	Neutralization Potential (t/1000t)	pH, SMP Buffer (Standard Units)	Recommended Lime (t/1000t)	SMP Lime Requirement (t/1000t)	Sulfur (HCL Extraction) (%)	Sulfur (HNO3 Extraction) (%)	Sulfur (Hot Water Extraction) (%)	Sulfur, Residual (%)	Sulfur, Total (%)
RY-SS-01	7/12/2011	0	1	8.2	ND(4.3)	8.2	6.3	6.3	4.6	ND(0.05)	ND(0.05)	ND(0.05)	ND(0.05)	ND(0.05)
RY-SS-02	7/12/2011	0	1	124	ND(4.3)	125	7	ND(5.4)	0	ND(0.05)	ND(0.05)	ND(0.05)	ND(0.05)	ND(0.05)
RY-SS-02	7/12/2011	2	4	6.2	ND(4.3)	6.2	5.8	8.2	5.9	ND(0.05)	ND(0.05)	ND(0.05)	ND(0.05)	ND(0.05)
RY-SS-03	7/12/2011	0	1	6.5	ND(4.3)	6.5	6.8	ND(5.4)	0.3	ND(0.05)	ND(0.05)	ND(0.05)	ND(0.05)	ND(0.05)
RY-SS-03	7/12/2011	12	14	3.7	ND(4.3)	3.7	7	ND(5.4)	0	ND(0.05)	ND(0.05)	ND(0.05)	ND(0.05)	ND(0.05)
RY-SS-04	7/12/2011	0	1	7	ND(4.3)	7	6.2	7	5.3	ND(0.05)	ND(0.05)	ND(0.05)	ND(0.05)	ND(0.05)
RY-SS-04	7/12/2011	2	4	4	ND(4.3)	4	6.8	ND(5.4)	1	ND(0.05)	ND(0.05)	ND(0.05)	ND(0.05)	ND(0.05)
RY-SS-04	7/12/2011	9	11	3	ND(4.3)	3	7	ND(5.4)	0	ND(0.05)	ND(0.05)	ND(0.05)	ND(0.05)	ND(0.05)
RY-SS-05	7/12/2011	0	1	7	ND(4.3)	7	6.1	8.6	6.1	ND(0.05)	ND(0.05)	ND(0.05)	ND(0.05)	ND(0.05)
RY-SS-05	7/12/2011	2	4	4.3	ND(4.3)	4.3	7	ND(5.4)	0	ND(0.05)	ND(0.05)	ND(0.05)	ND(0.05)	ND(0.05)
MW-RY-08	8/17/2011	0	0.5	2.4	ND(4.3)	2.4	7	ND(5.4)	0	ND(0.05)	ND(0.05)	ND(0.05)	ND(0.05)	ND(0.05)
CML-SS-11	7/15/2011	1	3	1.8	0.2	2	6.8	1.5	1	ND(0.05)	ND(0.05)	ND(0.05)	ND(0.05)	ND(0.05)
CML-SS-11	7/15/2011	8	10	4.4	ND(4.3)	4.4	6.8	ND(5.4)	1	ND(0.05)	ND(0.05)	ND(0.05)	ND(0.05)	ND(0.05)

ft - feet
t/1000t = tons of Calcium Carbonate ($CaCO_3$) per 1,000 tons waste
ND() - Analyte was not detected (reporting limit)

** Acid/Base Potential = NP - AP
Potentially Acid Generating:
Uncertain Acid Generation Potential:
Unlikely to Generate Acid:

NP = Neutralization Potential
AP = Acid Potential
NNP = Net Neutralizing Potential = Base - Acid Potential

NP:AP < 1 and NNP < -20 tons/kton
NP:AP between 1 and 3 and/or NNP between -20 and +20 tons/kton
NNP < +20 tons/kton

FIGURES

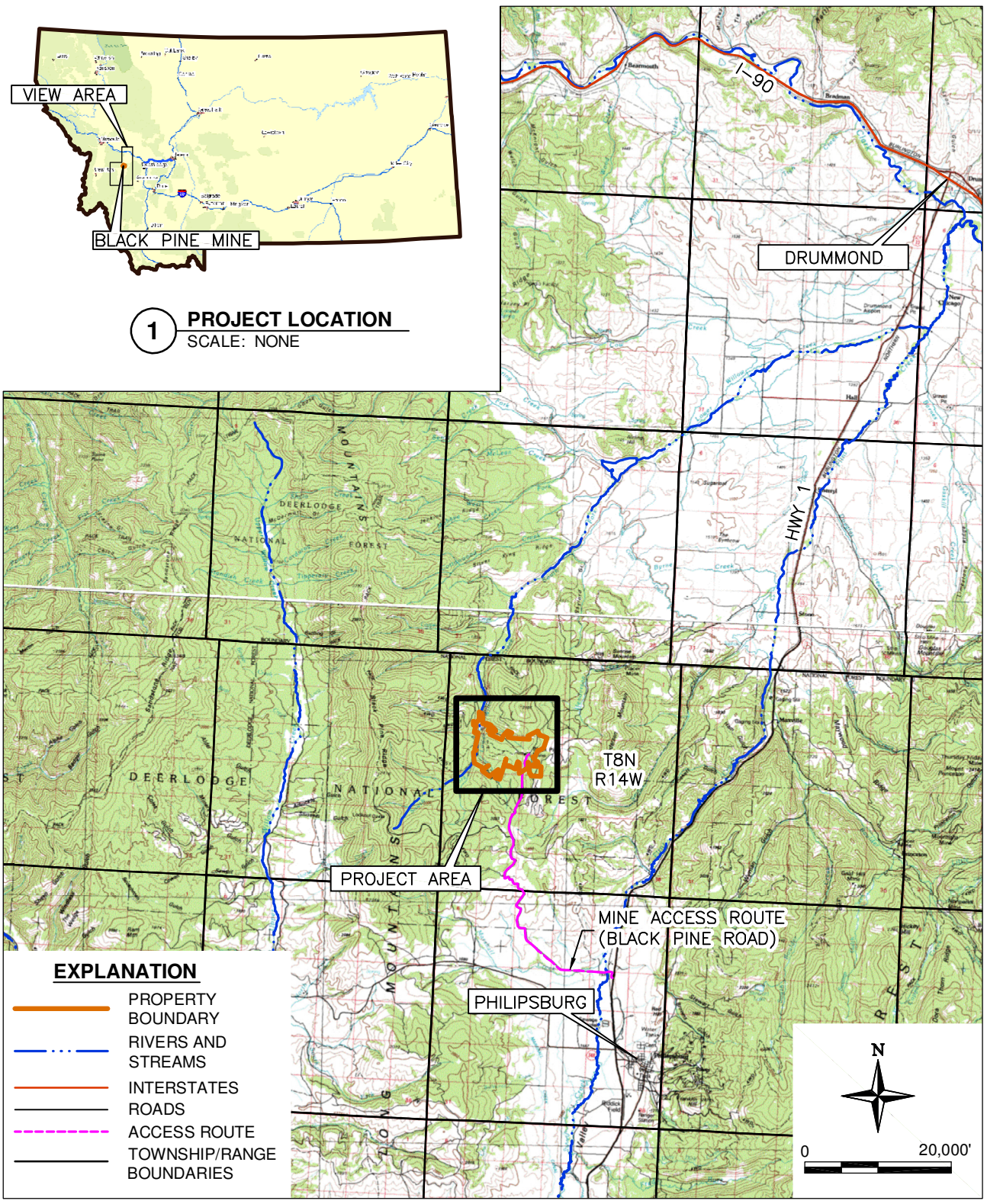

FIGURE 1-1

VICINITY MAP

BLACK PINE MINE RECLAMATION PROJECT
MONTANA DEQ
ABANDONED MINE SECTION

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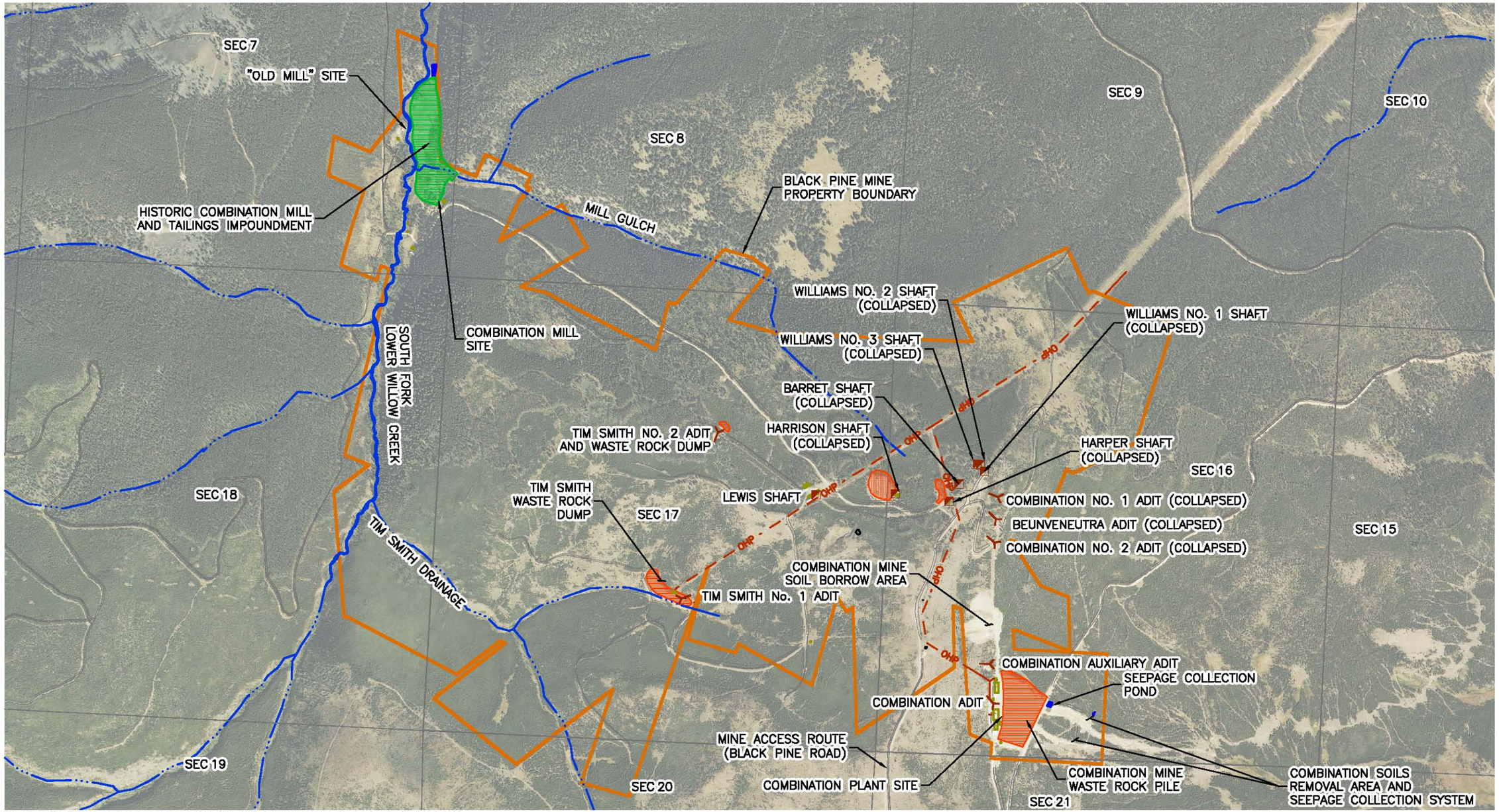
Drawn By: CJN	Checked By: MD	Scale: 1" = 20,000	Date: 11/23/11	File: 776_SITELOC_FIG_1-1



Basemap: USDA Farm Service Agency, Montana 2011 Color NAIP Orthophoto12-kM, Granite County. Published 2011.

EXPLANATION

- PROPERTY BOUNDARY
- EDGE OF ROAD
- SECTION BOUNDARIES
- OVERHEAD POWER (OHP)
- STREAMS
- BUILDING
- WASTE ROCK AREAS
- TAILINGS AREA
- ADIT
- SHAFT

N

0 1,200'

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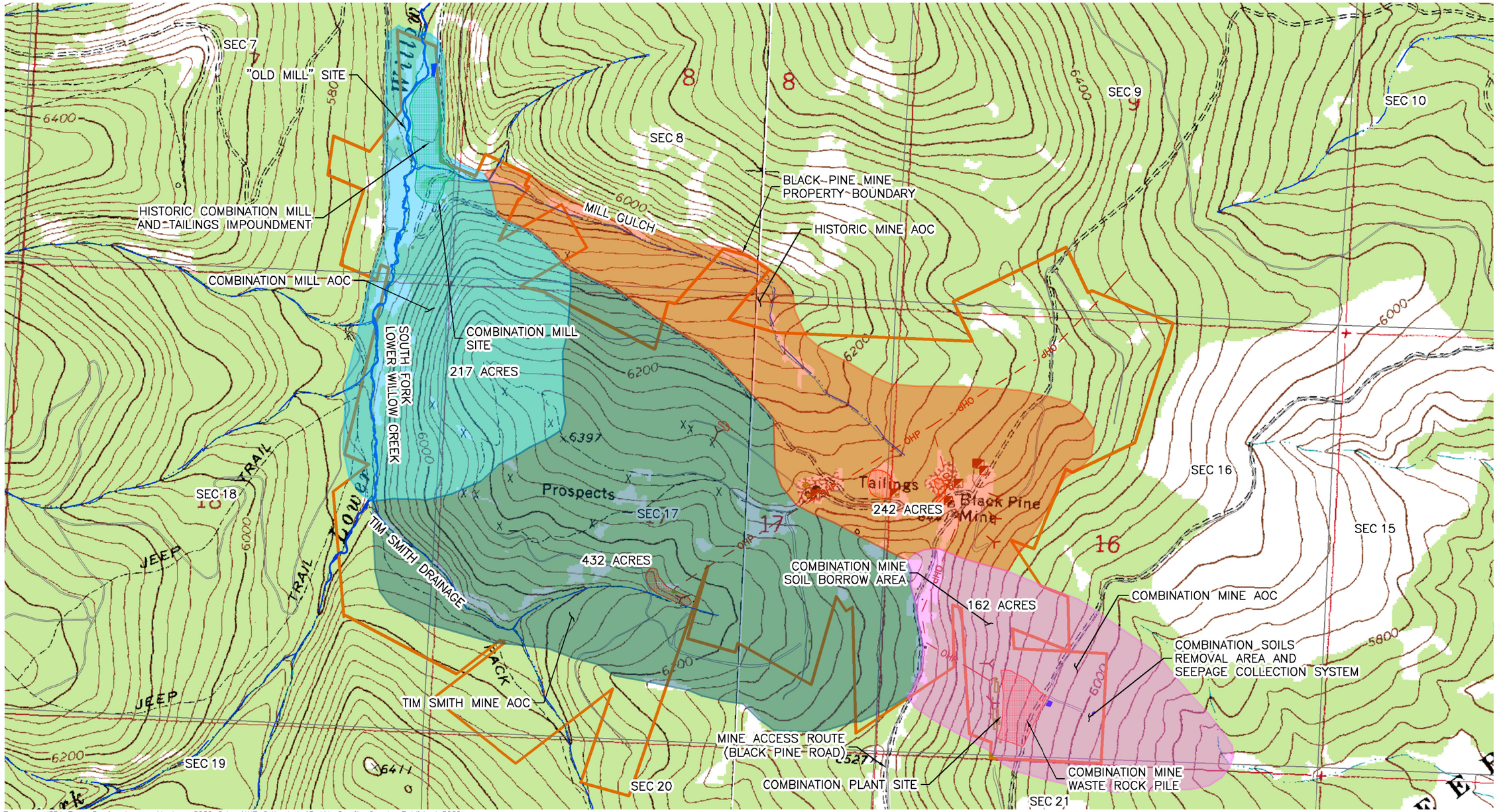
FIGURE 1-2

SITE FEATURES

BLACK PINE MINE RECLAMATION PROJECT
MONTANA DEQ
ABANDONED MINE SECTION

Drawn By: BH	Checked By: MD	Scale: 1" = 1,200'	Date: 1/5/12	File: 776_SITEFEAT_FIG_1-2



Basemap: USDA Farm Service Agency, Montana 2009 Color NAIP Orthophoto12-kM, Granite County. Published 2009.

EXPLANATION

- PROPERTY BOUNDARY
- EDGE OF ROAD
- SECTION BOUNDARIES
- OVERHEAD POWER
- STREAMS
- BUILDING
- APPROXIMATE AREAS OF CONCERN
- WASTE ROCK AREAS
- TAILINGS AREA
- ADIT
- SHAFT

N

0 1,200'

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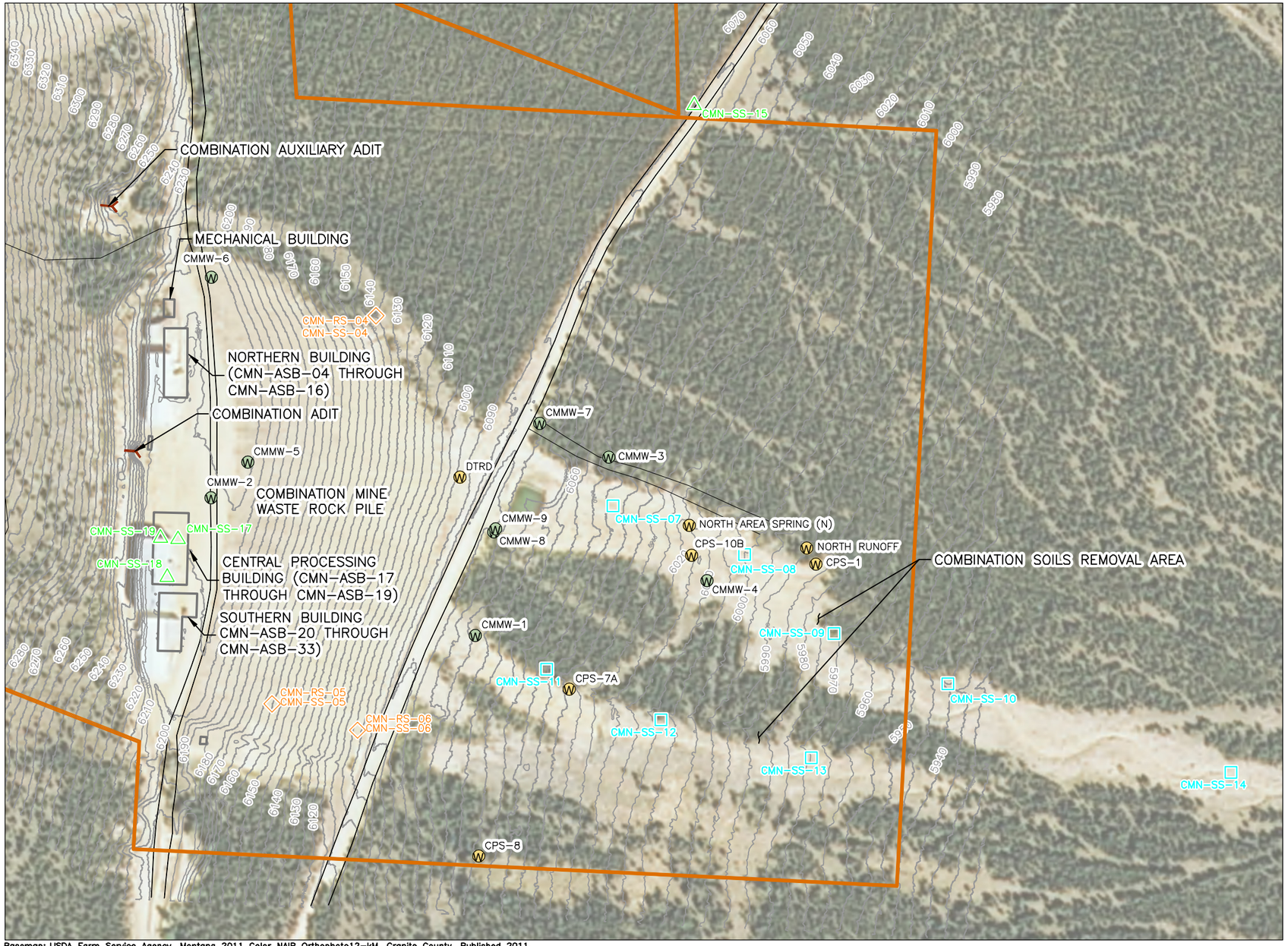
FIGURE 1-3

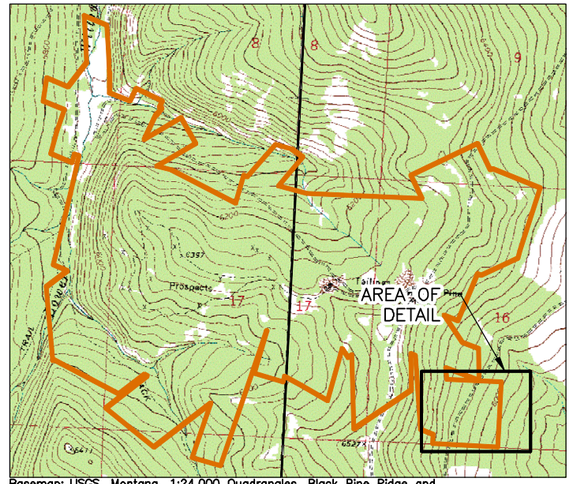
AREAS OF CONCERN

BLACK PINE MINE RECLAMATION PROJECT
MONTANA DEQ
ABANDONED MINE SECTION

Drawn By: BH	Checked By: MD	Scale: 1" = 1,200'	Date: 1/31/12	File: 776_AOC_FIG_1-3



Basemap: USDA Farm Service Agency, Montana 2011 Color NAIP Orthophoto12-kM, Granite County. Published 2011.



Basemap: USGS, Montana, 1:24,000 Quadrangles, Black Pine Ridge and Henderson Mountain, Published 2000.

KEY MAP
NOT TO SCALE

N

EXPLANATION

- PROPERTY BOUNDARY
- EXISTING STRUCTURE
- 5980 — EXISTING GROUND SURFACE CONTOURS (INTERVAL = 5')
- ADIT (APPROXIMATE LOCATION)
- CPS-8 — ROUTINE SPRING/SEEP/SURFACE WATER MONITORING SITES
- CMMW-1 — ROUTINE GROUNDWATER MONITORING SITES
- CMN-SS-08 — SAMPLE LOCATION AND DESIGNATION
- CMN-SS-09 — TEST PIT SAMPLE LOCATION AND DESIGNATION (SOIL)
- CMN-RS-06 / CMN-SS-06 — TEST PIT SAMPLE LOCATION AND DESIGNATION (WASTE ROCK)

SS	SURFACE SOIL
RS	WASTE ROCK
ASB	ASBESTOS

NOTES:

1. SEDIMENT SAMPLE AND ADDITIONAL SURFACE WATER SAMPLE LOCATIONS ARE LOCATED DOWN GRADIENT FROM CMN-SS-14 AND ARE SHOWN ON FIGURE 2-2.
2. CMN-SS-16 IS LOCATED NORTHEAST OF CMN-SS-15 AND IS SHOWN ON FIGURE 2-2.

N

0 200'

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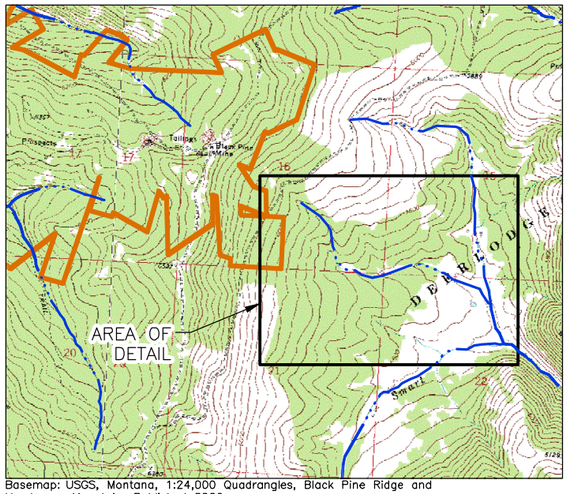
FIGURE 2-1

SAMPLE LOCATION MAP, COMBINATION MINE AREA OF CONCERN

BLACK PINE MINE RECLAMATION PROJECT
MONTANA DEQ
ABANDONED MINE SECTION

Drawn By: CJN	Checked By: AV	Scale: 1" = 200'	Date: 9/30/11	File: 776_SLM-CMA_FIG_2-1

Basemap: USDA Farm Service Agency, Montana 2011 Color NAIP Orthophoto12-kM, Granite County. Published 2011.



Basemap: USGS, Montana, 1:24,000 Quadrangles, Black Pine Ridge and Henderson Mountain, Published 2000.

KEY MAP
NOT TO SCALE

N

EXPLANATION

- PROPERTY BOUNDARY
- STREAM
- CMN-SS-01 — SAMPLE LOCATION AND DESIGNATION
- CMN-SS-14 — TEST PIT SAMPLE LOCATION AND DESIGNATION (SOIL)
- CMMW-4 — ROUTINE GROUNDWATER MONITORING SITES
- CPSW-2 — ROUTINE SPRING/SEEP/SURFACE WATER MONITORING SITES
- SS — SURFACE SOIL

N

0 600'

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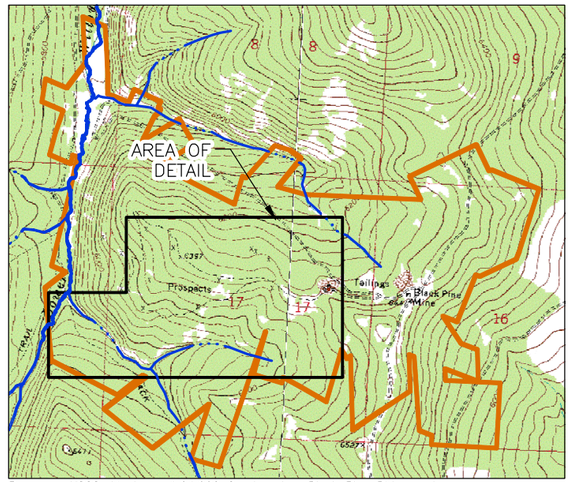
FIGURE 2-2
SAMPLE LOCATION MAP, SMART CREEK, COMBINATION MINE AREA OF CONCERN
BLACK PINE MINE RECLAMATION PROJECT
MONTANA DEQ
ABANDONED MINE SECTION

Drawn By: CJN	Checked By: AV	Scale: 1" = 600'	Date: 2/7/12	File: 776_SLM-SMRTCRK_FIG_2-2



Basemap: USGS, Montana, 1:24,000 Quadrangles, Black Pine Ridge and Henderson Mountain, Published 2000.

KEY MAP
NOT TO SCALE

N

N

0 400'

TIM SMITH No. 2 ADIT AND WASTE ROCK DUMP

TS-RS-07
TS-SS-07
TS-SS-08

LEWIS SHAFT

TS-SD-03
TSP-6
CML-SD-05/CML-SW-05

SOUTH FORK LOWER WILLOW CREEK

TIM SMITH DRAINAGE

TSP-8
TS-SD-01

TS-RS-01
TS-SS-01

TS-RS-03
TS-SS-03

TIM SMITH No. 1 ADIT

TIM SMITH No. 1 ADIT WASTE ROCK DUMP

TS-SS-02

TSP-9

TSP-3
TS-SD-02

TSP-10

Basemap: USDA Farm Service Agency, Montana 2011 Color NAIP Orthophoto12-kM, Granite County. Published 2011.

EXPLANATION

- PROPERTY BOUNDARY
- STREAM
- 6010 EXISTING GROUND SURFACE CONTOURS (INTERVAL = 5')
- TSP-6 ROUTINE SPRING/SEEP/SURFACE WATER MONITORING SITES
- CML-SD-05/CML-SW-05 MDEQ TMDL PROGRAM SITE WITH DESIGNATION
- TS-SD-08 SAMPLE LOCATION AND DESIGNATION
- TS-RS-03 TS-SS-03 TEST PIT SAMPLE LOCATION AND DESIGNATION (WASTE ROCK)
- ADIT (APPROXIMATE LOCATION)
- MINE SHAFT (APPROXIMATE LOCATION)
- TS-SS-08 TEST PIT SAMPLE LOCATION AND DESIGNATION (SOIL)

SD SEDIMENT
SW SURFACE WATER
SS SURFACE SOIL
RS WASTE ROCK

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FIGURE 2-3

**SAMPLE LOCATION MAP,
TIM SMITH MINE AREA OF CONCERN**

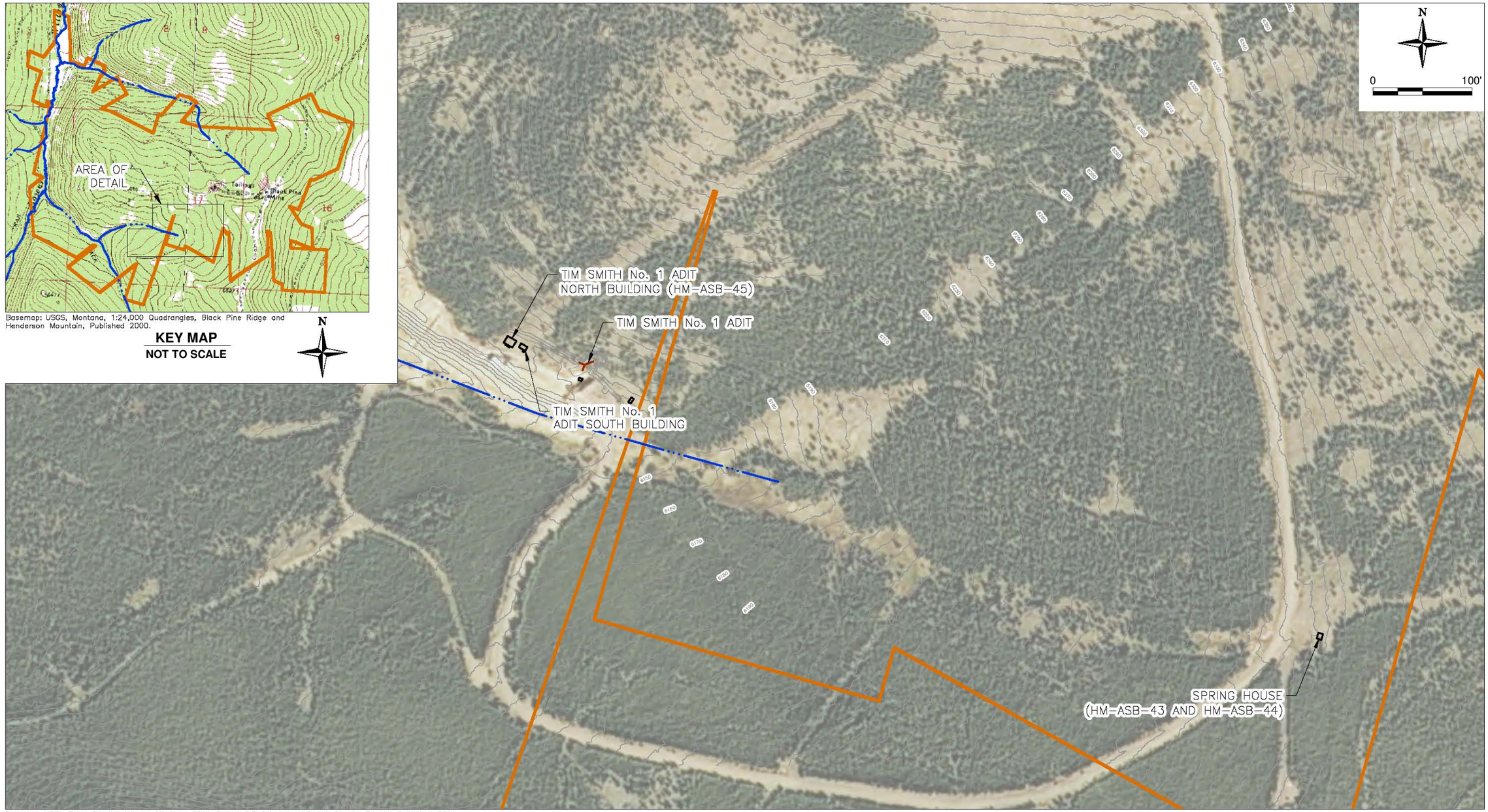
**BLACK PINE MINE RECLAMATION PROJECT
MONTANA DEQ
ABANDONED MINE SECTION**

Drawn By: CJN	Checked By: AV	Scale: 1" = 400'	Date: 1/5/12	File: 776_SLM-TS_FIG_2-3

Basemap: USGS, Montana, 1:24,000 Quadrangles, Black Pine Ridge and Henderson Mountain, Published 2000.

KEY MAP
NOT TO SCALE

N



Basemap: USDA Farm Service Agency, Montana 2011 Color NAIP Orthophoto12-kM, Granite County. Published 2011.

EXPLANATION

- PROPERTY BOUNDARY
- STREAM
- 6010 EXISTING GROUND SURFACE CONTOURS (INTERVAL = 5')
- ROUTINE SPRING/SEEP SURFACE
- EXISTING STRUCTURE
- ADIT (APPROXIMATE LOCATION)
- ASB ASBESTOS

NOTE

ASBESTOS SAMPLES WERE INCORRECTLY LABELED "HM" INSTEAD OF "TS" IN THE FIELD

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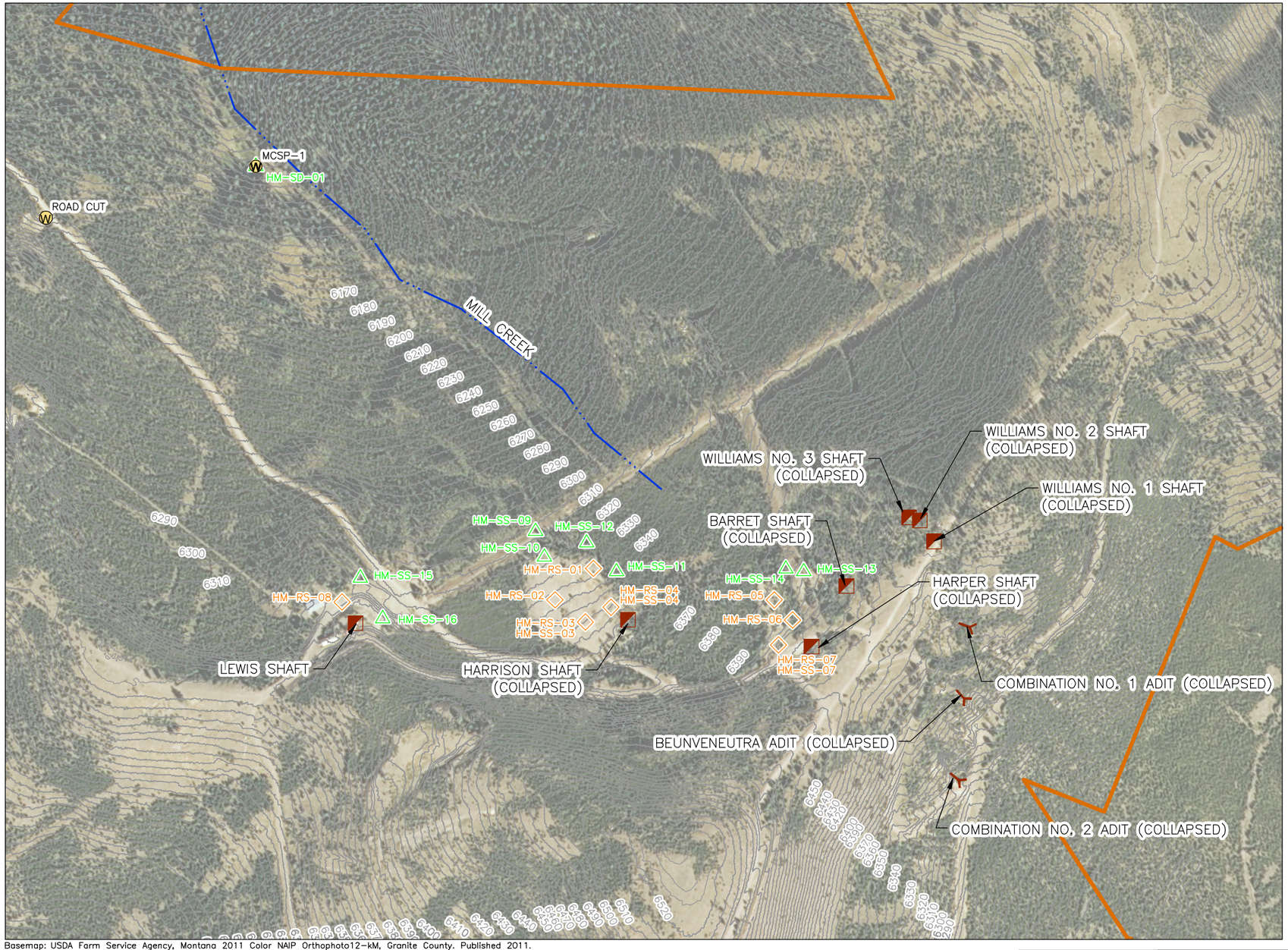
FIGURE 2-4

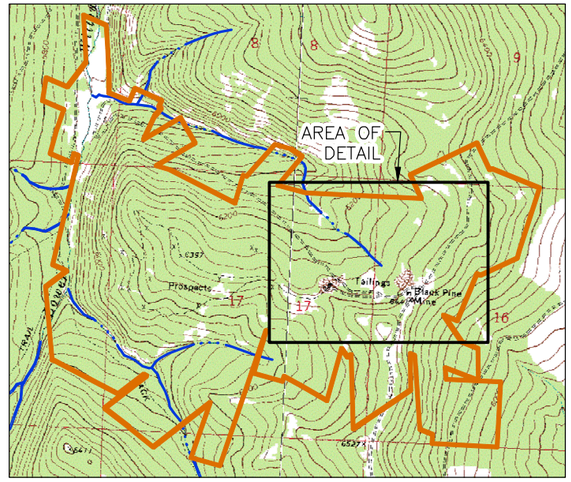
HAZARDOUS MATERIALS INVENTORY SAMPLE LOCATIONS, TIM SMITH MINE AREA OF CONCERN

BLACK PINE MINE RECLAMATION PROJECT
MONTANA DEQ
ABANDONED MINE SECTION

Drawn By: CJN	Checked By: AV	Scale: 1" = 100'	Date: 1/5/12	File: 776_SLM-TS_FIG_2-4



Basemap: USDA Farm Service Agency, Montana 2011 Color NAIP Orthophoto12-kM, Granite County. Published 2011.



KEY MAP
NOT TO SCALE

N

EXPLANATION

- PROPERTY BOUNDARY
- STREAM
- 6290 — EXISTING GROUND SURFACE CONTOURS (INTERVAL = 5')
- MINE SHAFT (APPROXIMATE LOCATION)
- ADIT (APPROXIMATE LOCATION)
- MCSP-1 — ROUTINE SPRING/SEEP/SURFACE WATER MONITORING SITES
- HM-SS-14 — SAMPLE LOCATION AND DESIGNATION
- HM-RS-03 / HM-SS-03 — TEST PIT SAMPLE LOCATION AND DESIGNATION (WASTE ROCK)
- SD — SEDIMENT
- SS — SURFACE SOIL
- RS — WASTE ROCK

N

0 400'

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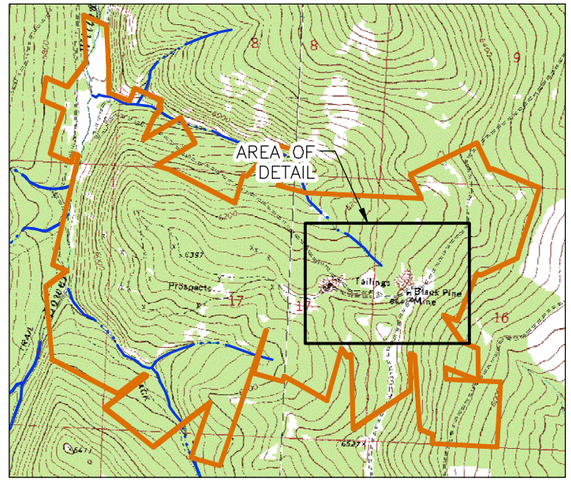
FIGURE 2-5

**SAMPLE LOCATION MAP,
HISTORIC MINE AREA OF CONCERN**

**BLACK PINE MINE RECLAMATION PROJECT
MONTANA DEQ
ABANDONED MINE SECTION**

Drawn By: CJN	Checked By: AV	Scale: 1" = 400'	Date: 11/23/11	File: 776_SLM-HMA_FIG_2-5

Basemap: USDA Farm Service Agency, Montana 2011 Color NAIP Orthophoto12-kM, Granite County. Published 2011.



KEY MAP
NOT TO SCALE

N

EXPLANATION

- PROPERTY BOUNDARY
- STREAM
- 6290 EXISTING GROUND SURFACE CONTOURS (INTERVAL = 5')
- EXISTING STRUCTURE
- MINE SHAFT (APPROXIMATE LOCATION)
- ASB ASBESTOS

N

0 300'

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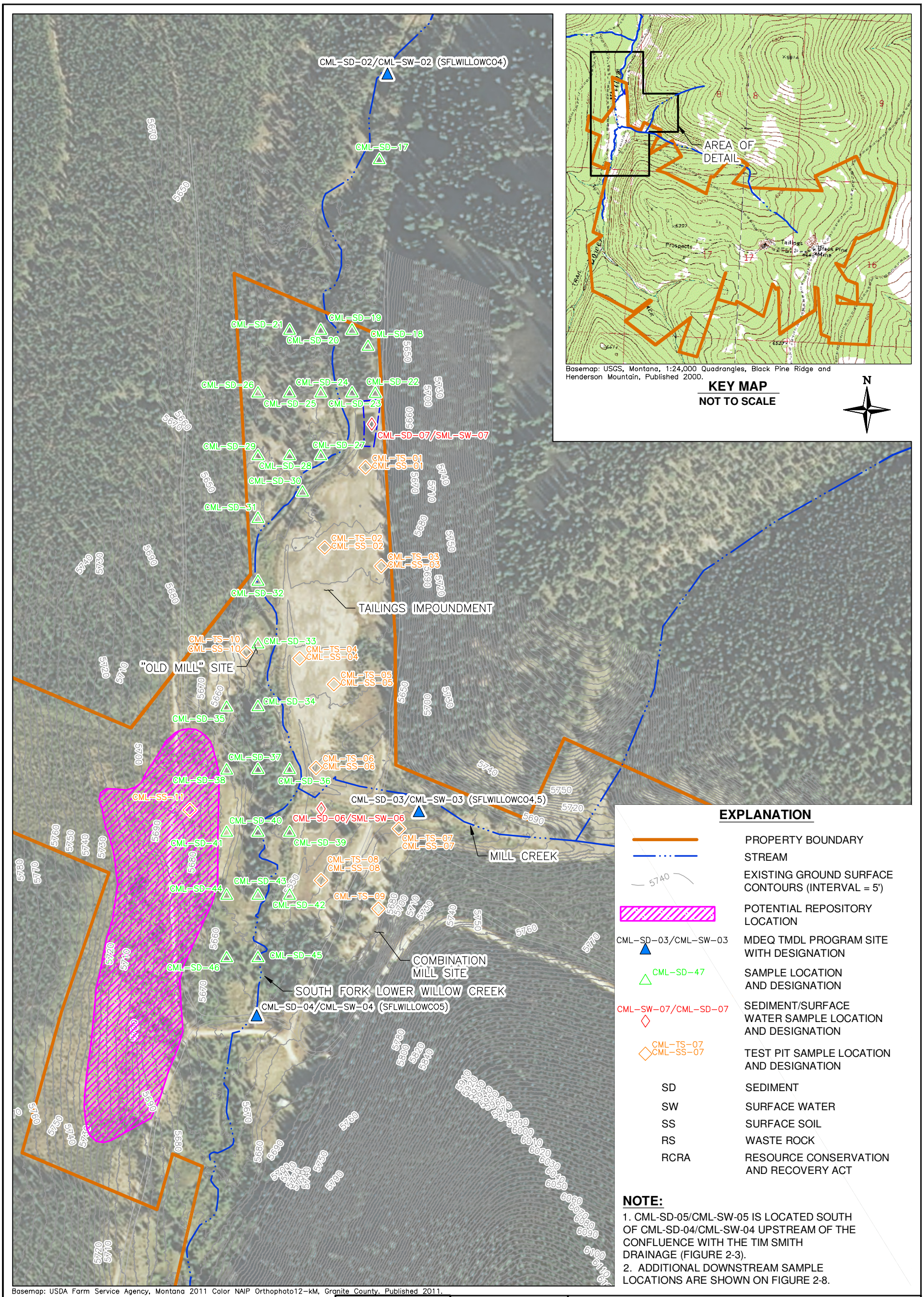
FIGURE 2-6
HAZARDOUS MATERIALS INVENTORY SAMPLE LOCATIONS, HISTORIC MINE AREA OF CONCERN
BLACK PINE MINE RECLAMATION PROJECT
MONTANA DEQ
ABANDONED MINE SECTION

Drawn By: CJN	Checked By: AV	Scale: 1" = 300'	Date: 1/31/12	File: 776_SLM-HMA_FIG_2-6



Basemap: USGS, Montana, 1:24,000 Quadrangles, Black Pine Ridge and Henderson Mountain, Published 2000.

KEY MAP
NOT TO SCALE

Basemap: USDA Farm Service Agency, Montana 2011 Color NAIP Orthophoto12-kM, Granite County, Published 2011.

EXPLANATION

	PROPERTY BOUNDARY
	STREAM
5740	EXISTING GROUND SURFACE CONTOURS (INTERVAL = 5')
	POTENTIAL REPOSITORY LOCATION
CML-SD-03/CML-SW-03	MDEQ TMDL PROGRAM SITE WITH DESIGNATION
CML-SD-47	SAMPLE LOCATION AND DESIGNATION
CML-SW-07/CML-SD-07	SEDIMENT/SURFACE WATER SAMPLE LOCATION AND DESIGNATION
CML-TS-07 CML-SS-07	TEST PIT SAMPLE LOCATION AND DESIGNATION
SD	SEDIMENT
SW	SURFACE WATER
SS	SURFACE SOIL
RS	WASTE ROCK
RCRA	RESOURCE CONSERVATION AND RECOVERY ACT

NOTE:

1. CML-SD-05/CML-SW-05 IS LOCATED SOUTH OF CML-SD-04/CML-SW-04 UPSTREAM OF THE CONFLUENCE WITH THE TIM SMITH DRAINAGE (FIGURE 2-3).
2. ADDITIONAL DOWNSTREAM SAMPLE LOCATIONS ARE SHOWN ON FIGURE 2-8.

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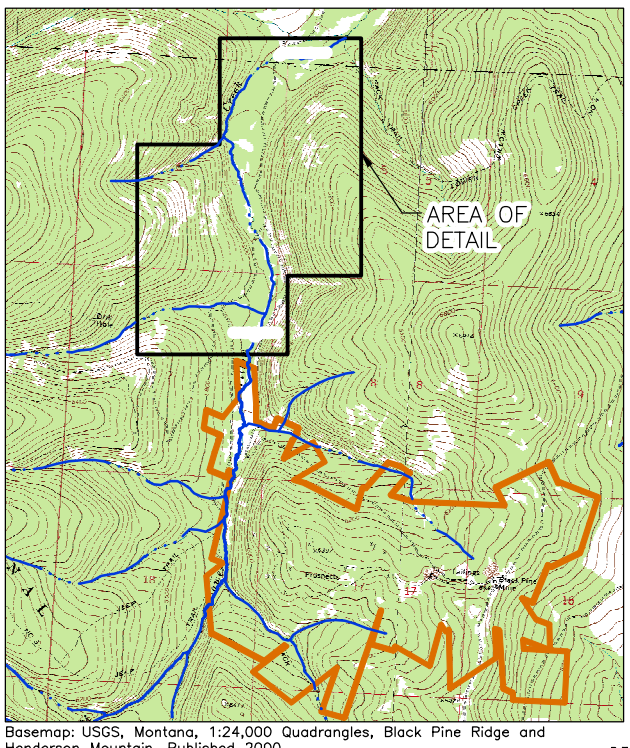
FIGURE 2-7

SAMPLE LOCATION MAP, COMBINATION MILL AREA OF CONCERN

BLACK PINE MINE RECLAMATION PROJECT
MONTANA DEQ
ABANDONED MINE SECTION

Drawn By: CJN	Checked By: AV	Scale: 1" = 300'	Date: 9/30/11	File: 776_SLM-COMB_FIG_2-7



Basemap: USGS, Montana, 1:24,000 Quadrangles, Black Pine Ridge and Henderson Mountain, Published 2000.

KEY MAP
NOT TO SCALE

N

CML-SD-01/CML-SW-01 (SFLWILLOWCO3)
CML-SD-08/CML-SW-08
CML-SD-13
CML-SD-09/CML-SW-09
CML-SD-14
FORMER AMALGAMATION MILL
CML-SD-10/CML-SW-10
CML-SD-15
SOUTH FORK LOWER WILLOW CREEK
CML-SD-11/CML-SW-11
CML-SD-16
CML-SD-02/CML-SW-02 (SFLWILLOWCO4)
CML-SD-17

EXPLANATION

- PROPERTY BOUNDARY
- STREAM
- 5740 EXISTING GROUND SURFACE CONTOURS (INTERVAL = 5')
- CML-SD-02/CML-SW-02 MDEQ TMDL PROGRAM SITE WITH DESIGNATION
- CML-SD-47 SAMPLE LOCATION AND DESIGNATION
- CML-SD-07/CML-SW-07 SEDIMENT/SURFACE WATER SAMPLE LOCATION AND DESIGNATION
- SD SEDIMENT
- SW SURFACE WATER

Basemap: USDA Farm Service Agency, Montana 2011 Color NAIP Orthophoto12-kM, Granite County. Published 2011.

N

0 600'

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FIGURE 2-8
SAMPLE LOCATION MAP,
SOUTH FORK LOWER WILLOW CREEK,
COMBINATION MILL AREA OF CONCERN
BLACK PINE MINE RECLAMATION PROJECT
MONTANA DEQ
ABANDONED MINE SECTION

Drawn By: CJN	Checked By: AV	Scale: 1" = 600'	Date: 9/30/11	File: 776_SLM-COMB2_FIG_2-8

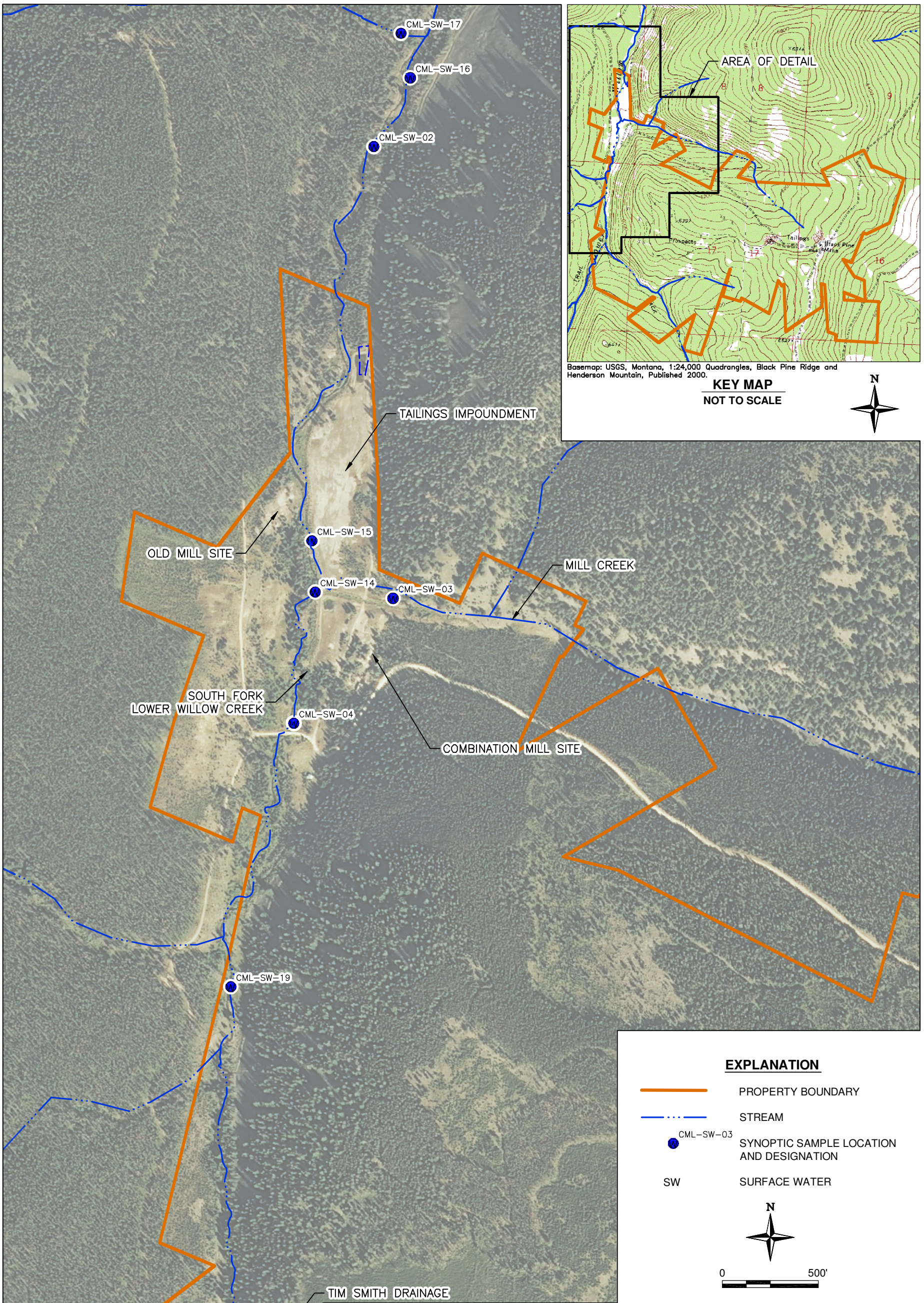

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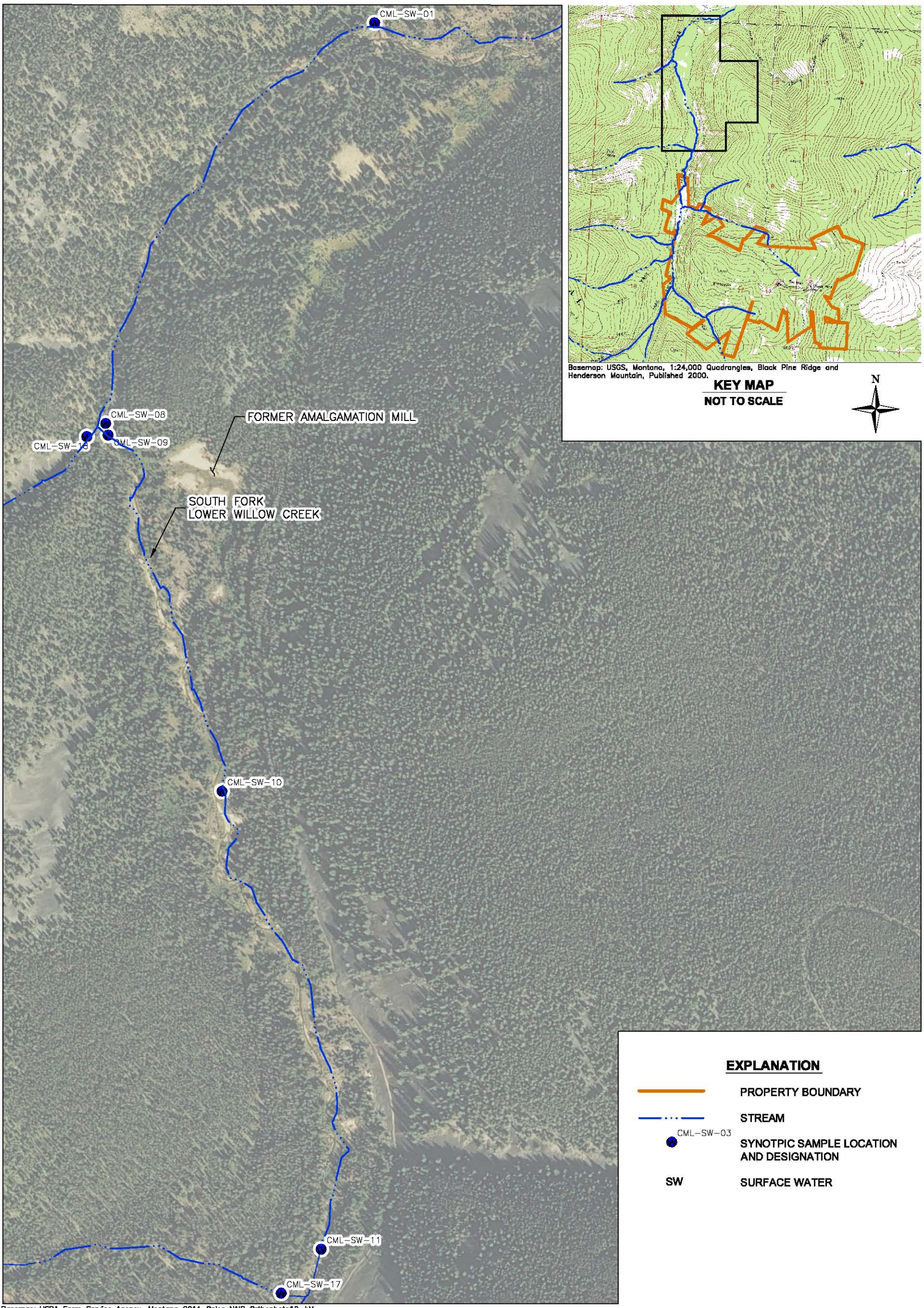
FIGURE 2-9

SYNOPTIC SAMPLE LOCATION MAP, SOUTH FORK LOWER WILLOW CREEK (UPSTREAM), COMBINATION MILL AREA OF CONCERN

BLACK PINE MINE RECLAMATION PROJECT
MONTANA DEQ
ABANDONED MINE SECTION

Drawn By: CJN	Checked By: AV	Scale: 1" = 500'	Date: 9/30/11	File: 776_SYNOPTIC_FIG-9-10



Basemap: USGS, Montana, 1:24,000 Quadrangles, Black Pine Ridge and Henderson Mountain, Published 2000.

KEY MAP

NOT TO SCALE

Basemap: USDA Farm Service Agency, Montana 2011 Color NAIP Orthophoto12-kM, Granite County. Published 2011.

N

0 500'

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FIGURE 2-10

SYNOPTIC SAMPLE LOCATION MAP, SOUTH FORK LOWER WILLOW CREEK (DOWNSTREAM), COMBINATION MILL AREA OF CONCERN

BLACK PINE MINE RECLAMATION PROJECT
MONTANA DEQ
ABANDONED MINE SECTION

Drawn By: CJN	Checked By: AV	Scale: 1" = 500'	Date: 9/30/11	File: 776_SYNOPTIC_FIG-9-10

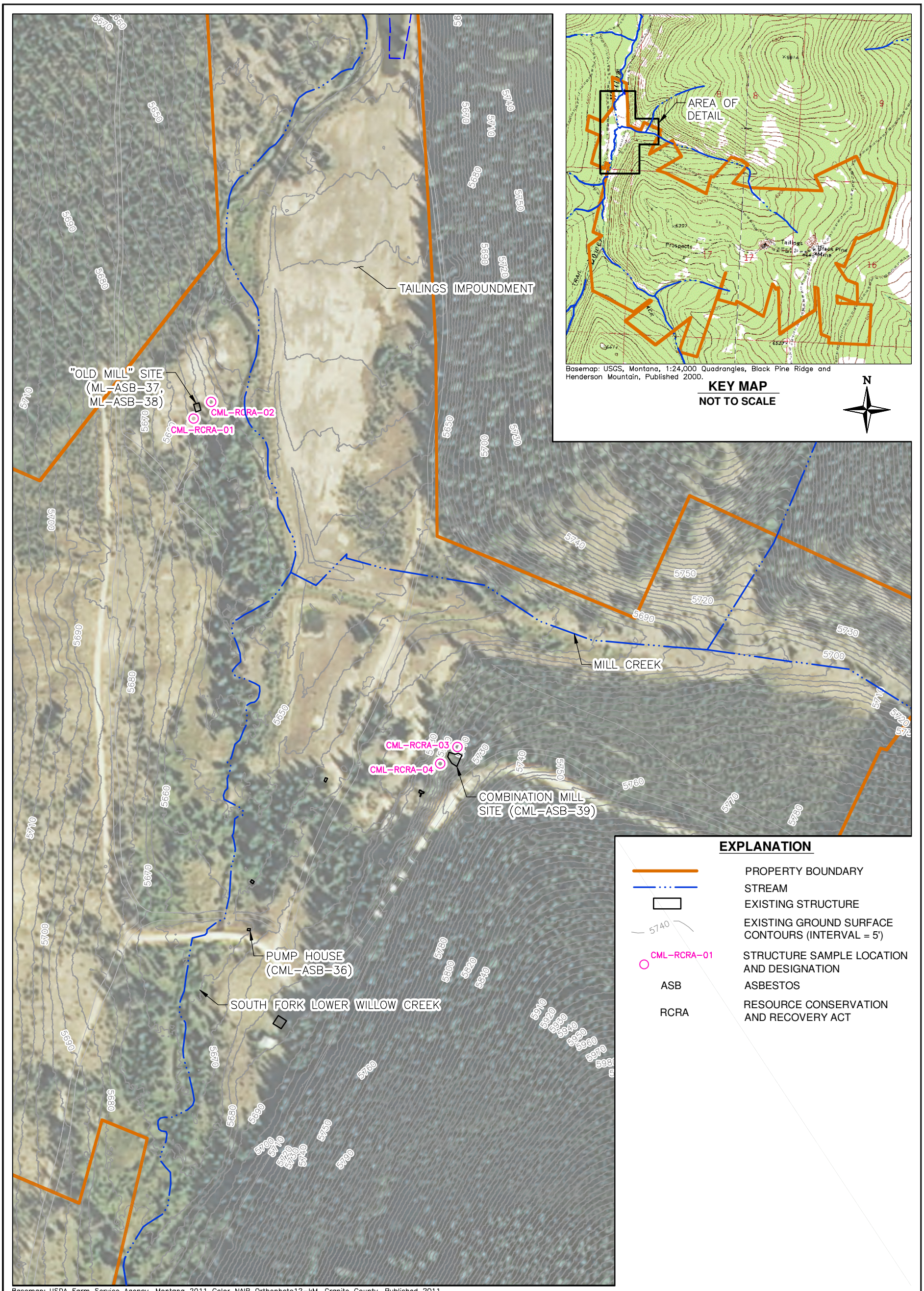

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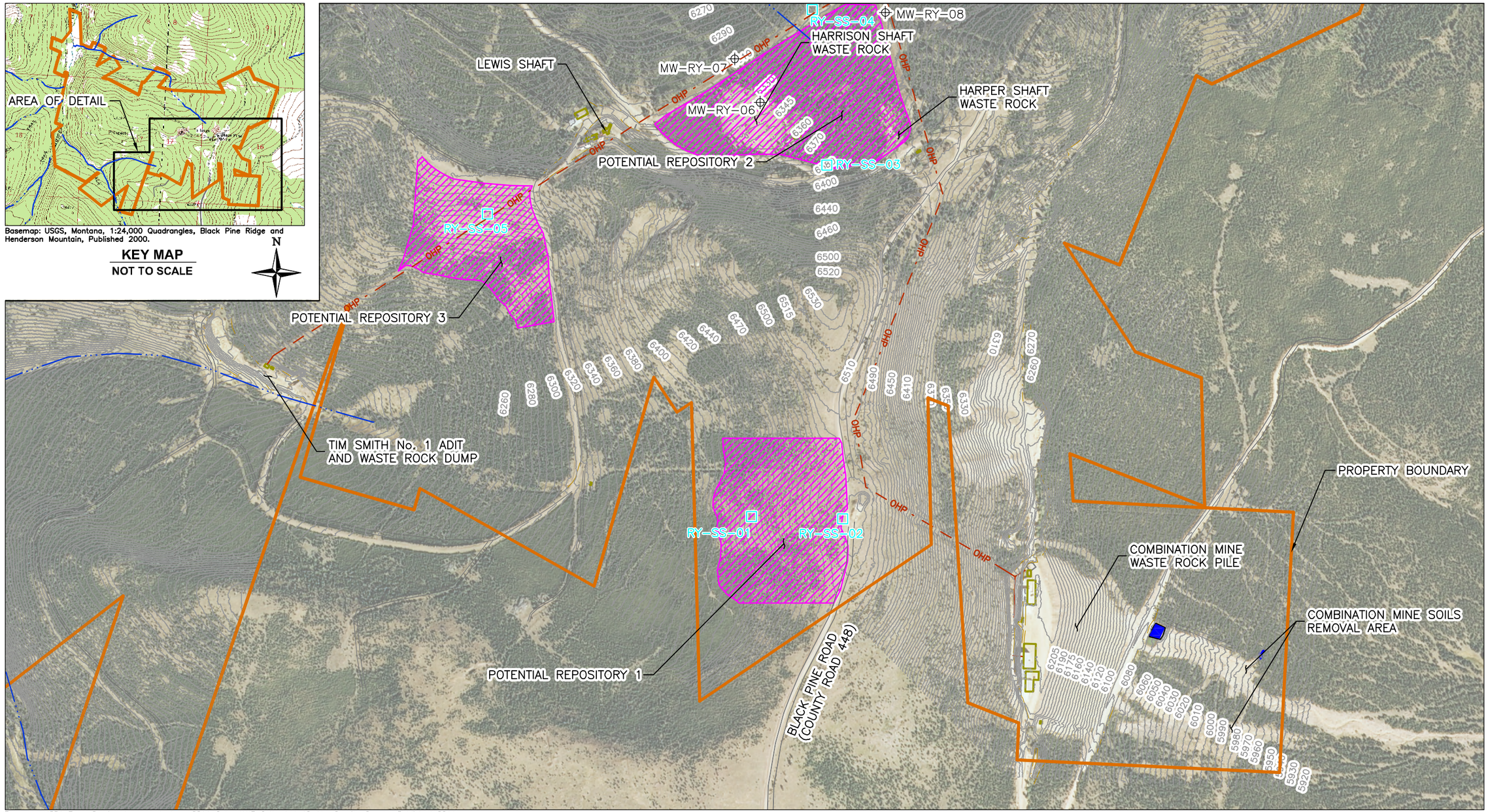
FIGURE 2-11

HAZARDOUS MATERIALS INVENTORY SAMPLE LOCATIONS, COMBINATION MILL AREA OF CONCERN

BLACK PINE MINE RECLAMATION PROJECT
MONTANA DEQ
ABANDONED MINE SECTION

Drawn By: CJN	Checked By: AV	Scale: 1" = 200'	Date: 11/22/11	File: 776_SLM-COMB_FIG_2-11



Basemap: USDA Farm Service Agency, Montana 2011 Color NAIP Orthophoto12–kM, Granite County. Published 2011.

EXPLANATION

- 6260 — EXISTING GROUND SURFACE CONTOURS (5' INTERVAL)
- OHP — OVERHEAD POWER
- PROPERTY BOUNDARY
- EDGE OF ROAD
- POTENTIAL REPOSITORY LOCATION
- BUILDING
- RY-SS-04 — TEST PIT LOCATION AND DESIGNATION
- MW-RY-1 — SOIL BORING/ MONITORING WELL LOCATION AND DESIGNATION

N

0 500'

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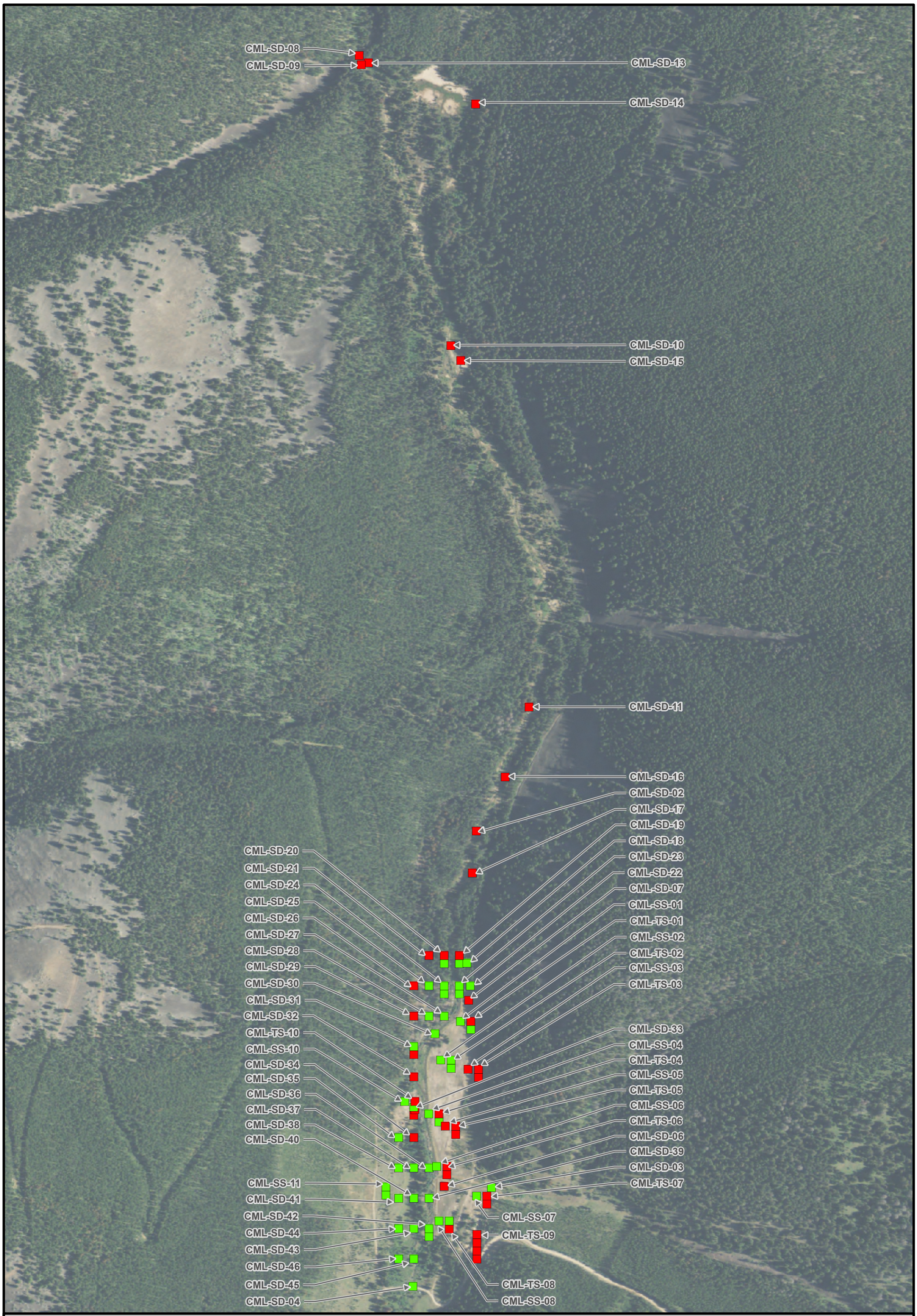
FIGURE 2-12

SAMPLE LOCATION MAP, POTENTIAL REPOSITORIES

BLACK PINE MINE RECLAMATION PROJECT
MONTANA DEQ
ABANDONED MINE SECTION

Drawn By: BH	Checked By: MD	Scale: AS SHOWN	Date: 2/7/12	File: 776_SLM-REPOS_FIG_2-12



Legend

Antimony values (mg/kg)

- < 293
- ≥ 293

DEQ RBCG = 293

Samples collected at depth are displayed below.

Figure 3-1. Antimony exceedance locations.

N

0 300 600 1,200 Feet

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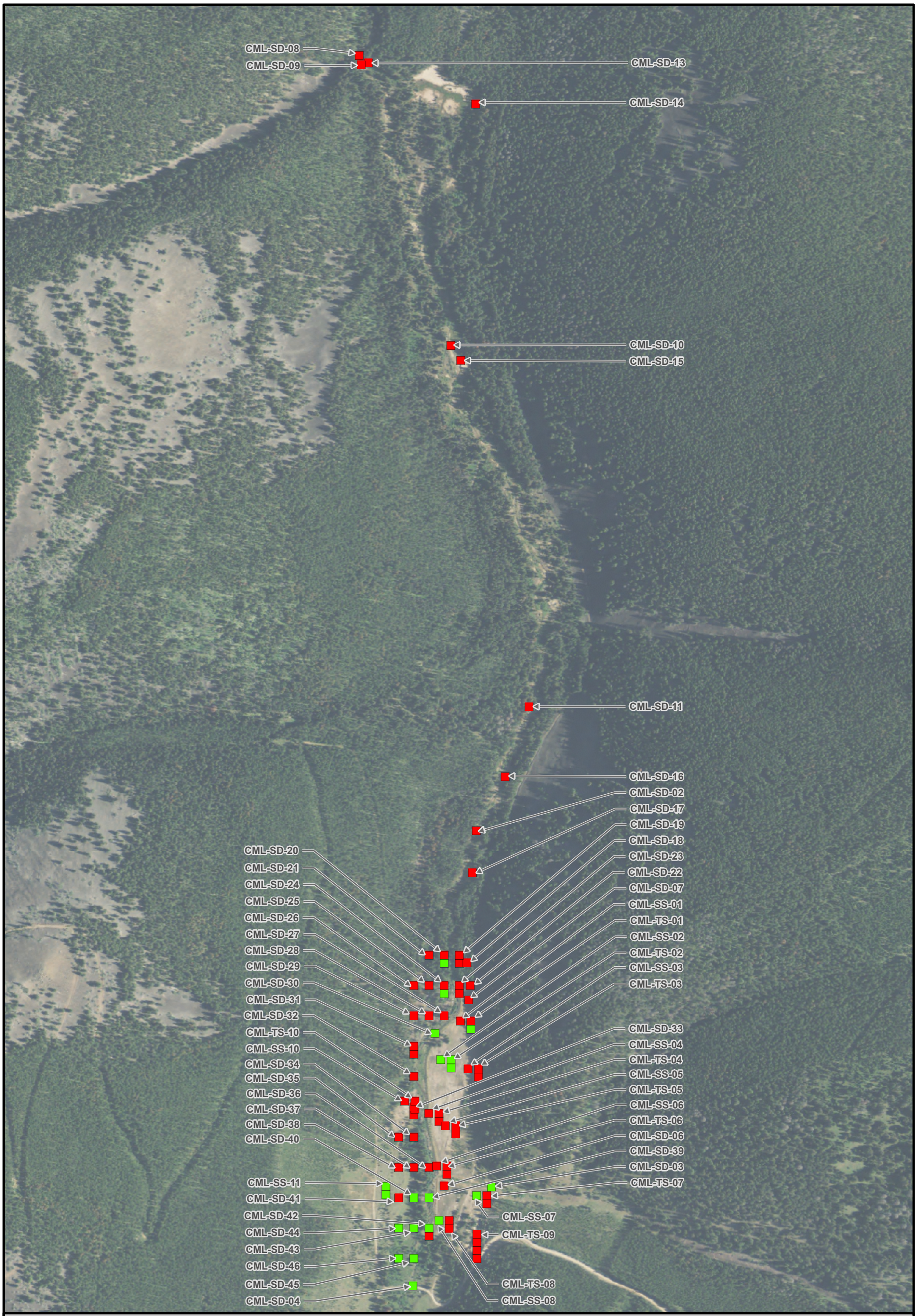
Aerial: USDA (2009)

K:\Projects\06-03425-011\Project\metal_gradients-cml-report.mxd (4/6/2012)



Legend

Arsenic values (mg/kg)

- < 40.4
- ≥ 40.4

DEQ RBCG = 40.4

Samples collected at depth are displayed below.

Figure 3-2. Arsenic exceedance locations.

N

0 300 600 1,200 Feet

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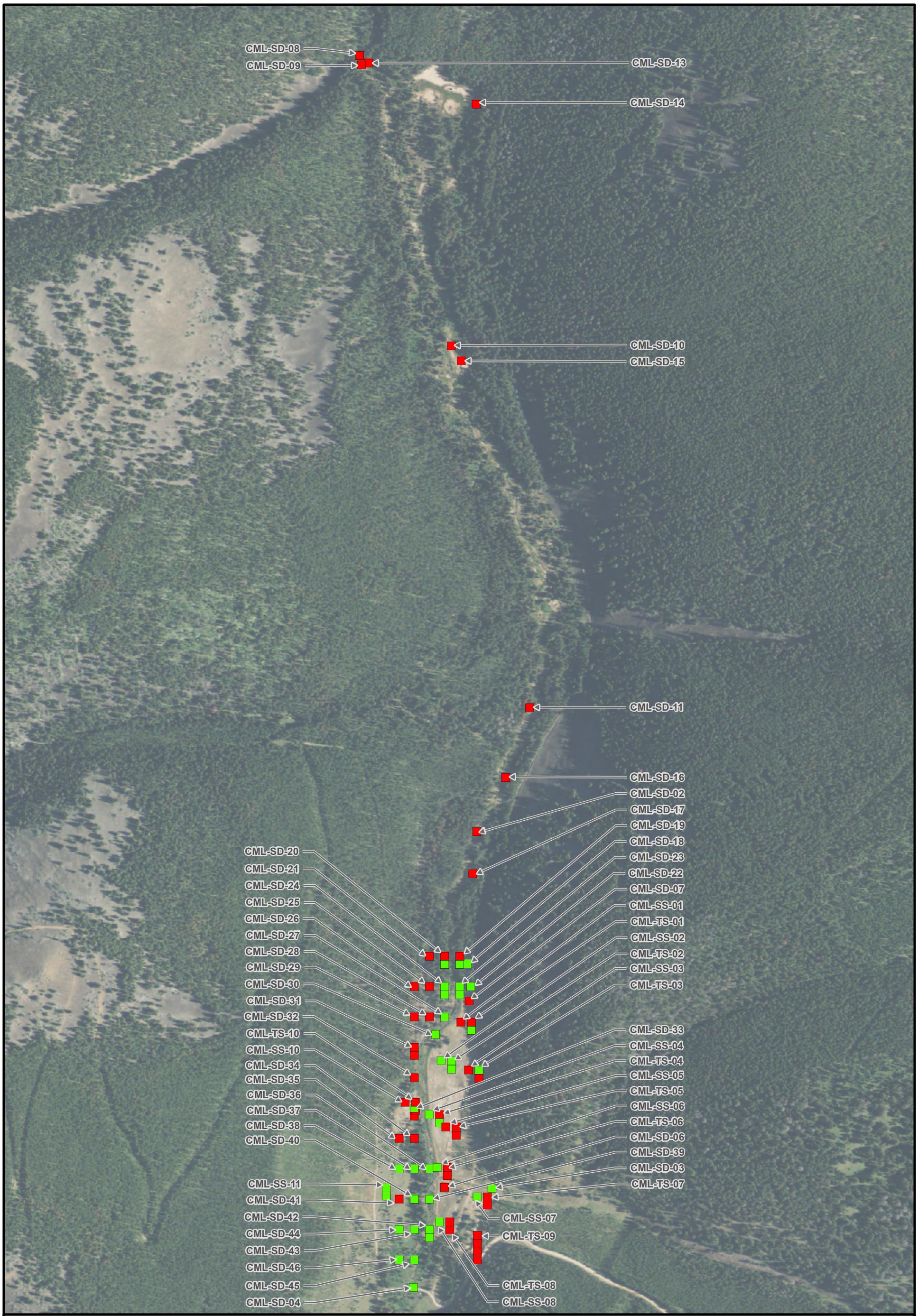
Aerial: USDA (2009)

K:\Projects\06-03425-011\Project\metal_gradients-cml-report.mxd (4/6/2012)



Legend

Lead values (mg/kg)

- < 1100
- ≥ 1100

DEQ RBCG = 1100

Samples collected at depth are displayed below.

Figure 3-3. Lead exceedance locations.

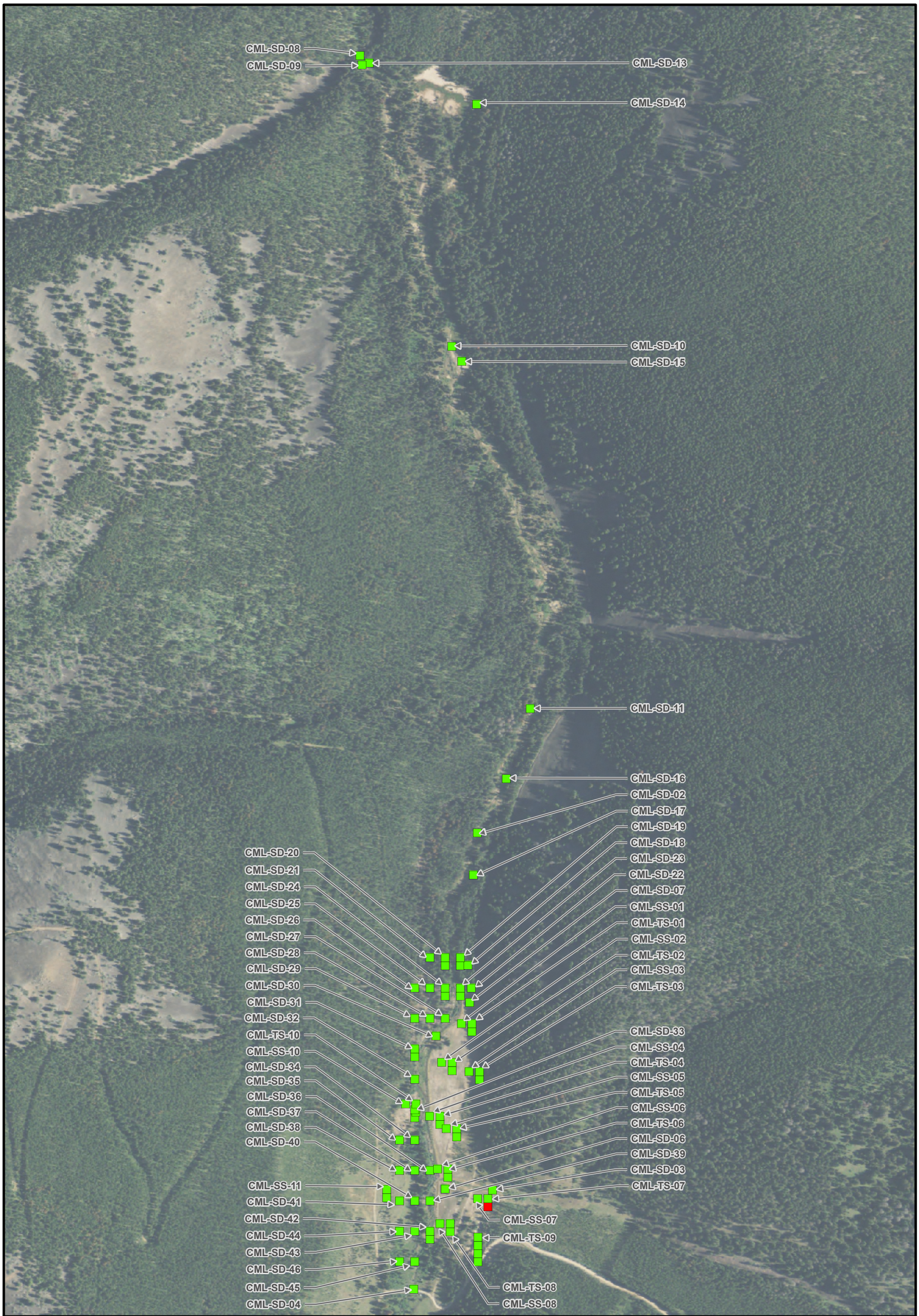
N

0 300 600 1,200 Feet

HERRERA

Aerial: USDA (2009)

K:\Projects\06-03425-011\Project\metal_gradients-cml-report.mxd (4/6/2012)



Legend

Mercury values (mg/kg)

- < 220
- ≥ 220

DEQ RBCG = 220

Samples collected at depth are displayed below.

Figure 3-4. Mercury exceedance locations.

N

0 300 600 1,200 Feet

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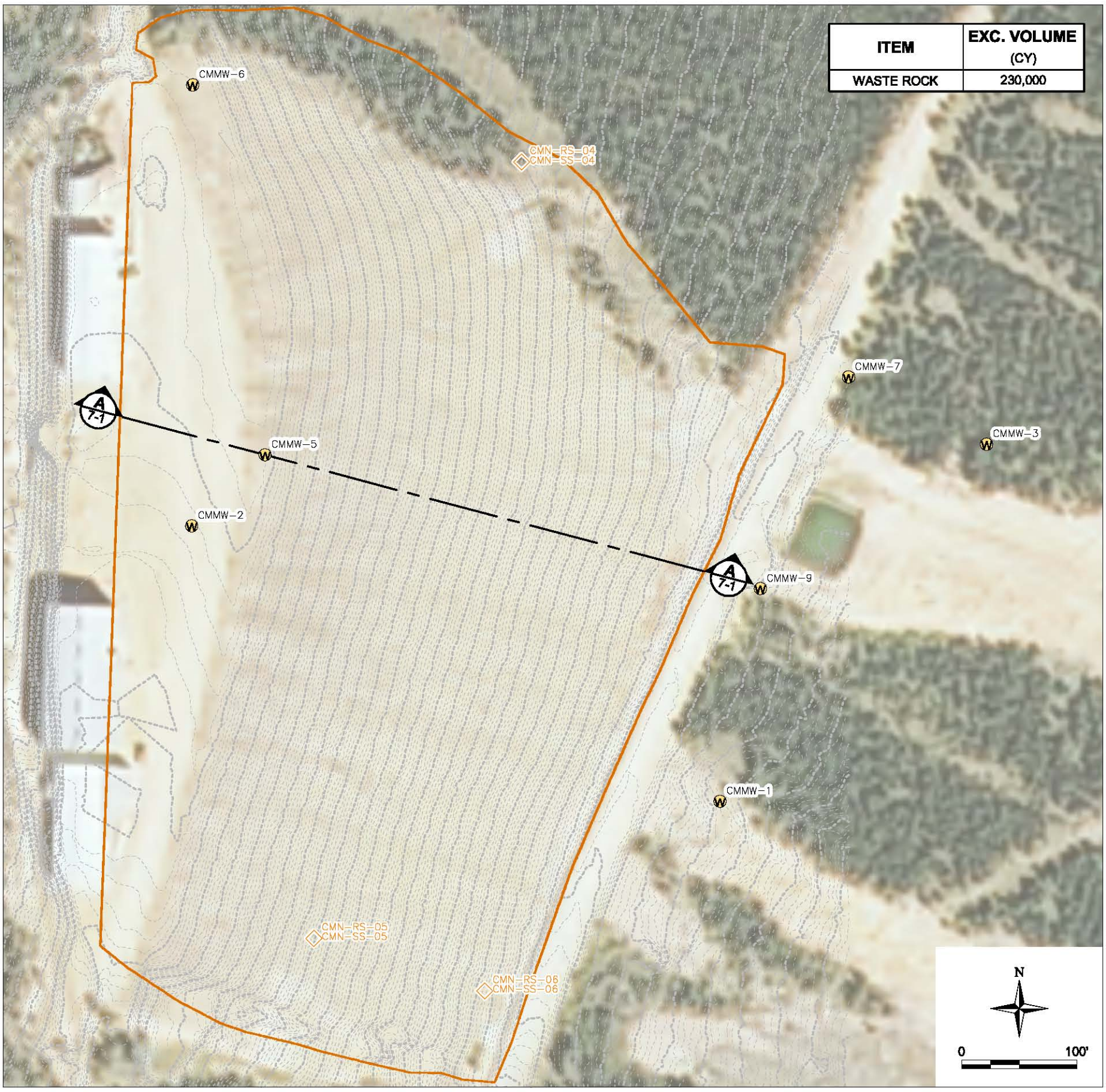
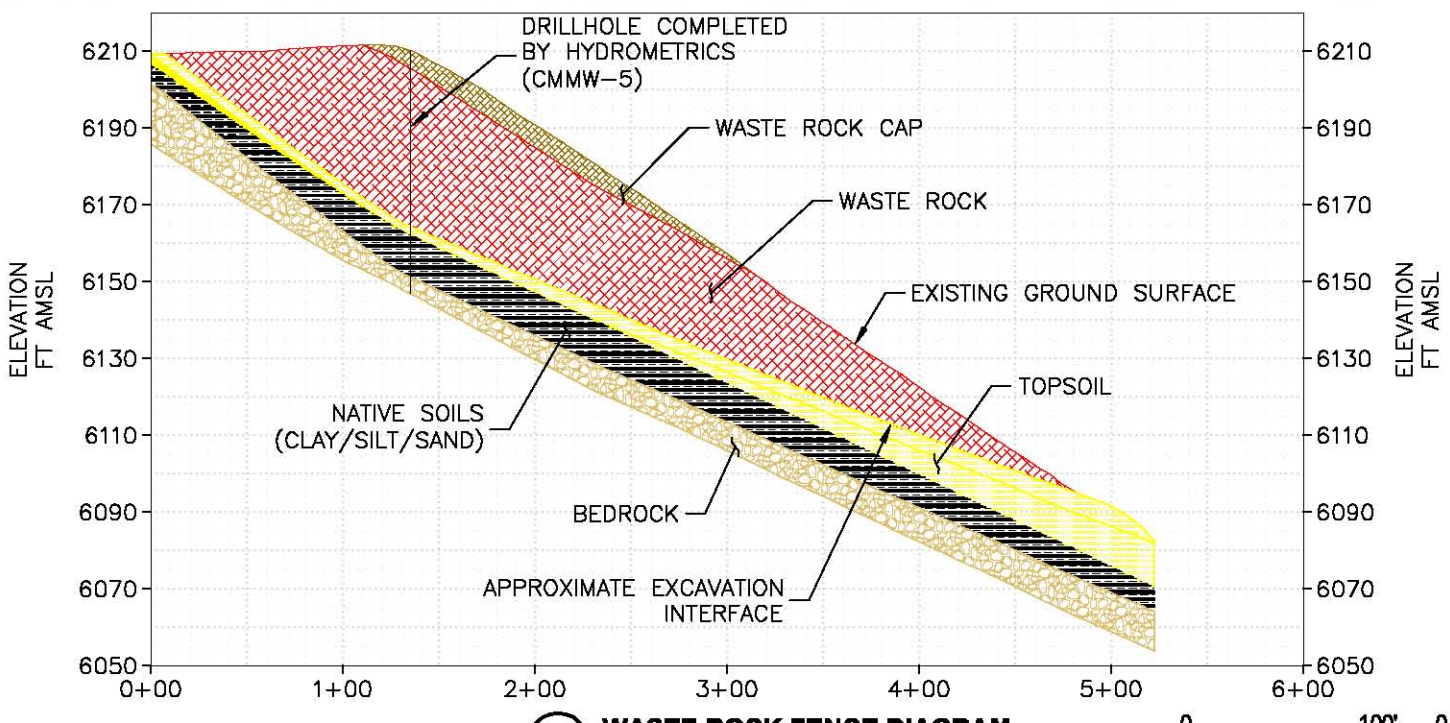
Aerial: USDA (2009)

K:\Projects\06-03425-011\Project\metal_gradients-cml-report.mxd (4/6/2012)

ITEM	EXC. VOLUME (CY)
WASTE ROCK	230,000





EXPLANATION

CMMW–1	EXISTING BORING
CMN–RS–06 CMN–SS–06	TEST PIT LOCATION
	EXCAVATION BOUNDARY
	EXISTING CONTOURS (5' INTERVAL)
SS	SURFACE SOIL
RS	WASTE ROCK
ASB	ASBESTOS
FT AMSL	FEET ABOVE MEAN SEA LEVEL

A WASTE ROCK FENCE DIAGRAM
SCALE H: 1" = 100' V: 1" = 50'

0 100' HORIZONTAL

0 50' VERTICAL

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FIGURE 7-1

COMBINATION MINE WASTE ROCK PILE VOLUME ESTIMATE

BLACK PINE MINE RECLAMATION PROJECT
MONTANA DEQ
ABANDONED MINE SECTION

Drawn By: BAH	Checked By: MD	Scale: AS SHOWN	Date: 4/12/12	File: 776_STRATACALC

APPENDIX A

SUMMARY OF MATERIALS SAMPLED FOR ASBESTOS

APPENDIX A. SUMMARY OF MATERIALS SAMPLED FOR ASBESTOS
BLACK PINE MINE

Sample	Location	Material	HM*	Result
Combination Mine AOC				
CNM-ASB-04[a]	Northern building; E wall of NE office	Aircell insulation	1	ND
CNM-ASB-05[a]	Northern building; N wall of N storage room	Aircell insulation	1	ND
CNM-ASB-06[a]	Northern building; W wall	Aircell insulation	1	ND
CNM-ASB-07[a]	Northern building; E wall of NE office	Gypsum wallboard system	2	ND
CNM-ASB-08[a]	Northern building; E wall of NE office	Gypsum wallboard system	2	ND
CNM-ASB-09[a]	Northern building; S wall of NE office	Gypsum wallboard system	2	ND
CNM-ASB-10[a]	Northern building; N storage room	White pipe sealant	3	ND
CNM-ASB-11[a]	Northern building; N storage room	White pipe sealant	3	ND
CNM-ASB-12[a]	Northern building; N central	Poured concrete floor	4	ND
CNM-ASB-13[a]	Northern building; E side of S end	Poured concrete floor	4	ND
CNM-ASB-14[a]	Northern building; W side of S end	Poured concrete floor	4	ND
CNM-ASB-15[a]	Northern building; N end of E office	Ceiling tiles	5	ND
CNM-ASB-16[a]	Northern building; E side of E office	Ceiling tiles	5	ND
CNM-ASB-17[a]	Central processing building; E	Sprayed on	6	ND

APPENDIX A. SUMMARY OF MATERIALS SAMPLED FOR ASBESTOS
BLACK PINE MINE

Sample	Location	Material	HM*	Result
	wall	fireproofing		
CNM-ASB-18[a]	Central processing building; N wall	Sprayed on fireproofing	6	ND
CMN-ASB-19	Central processing building; W wall	Sprayed on fireproofing	6	ND
CMN-ASB-20	Southern building; N end of E wall in S office of E building addition	Gypsum wallboard system	7	ND
CMN-ASB-21	Southern building; S end of E wall in S office of E building addition	Gypsum wallboard system	7	ND
CMN-ASB-22	Southern building; E wall of S end	Square pattern wall panels	8	ND
CMN-ASB-23	Southern building; W side of S end	Square pattern wall panels	8	ND
CMN-ASB-24	Southern building; S side of S end	Square pattern wall panels	8	ND
CMN-ASB-25	Southern building; N wall of SE office	Rain drop pattern wall panels	9	ND
CMN-ASB-26	Southern building; E wall of SE office	Rain drop pattern wall panels	9	ND
CMN-ASB-27	Southern building; S wall of SE office	Laminate wall panels	10	ND
CMN-ASB-28	Southern building; S wall of SE office	Laminate wall panels	10	ND
CMN-ASB-29	Southern building; S office of E building addition	Rain drop pattern ceiling tile	11	ND
CMN-ASB-30	Southern building; E end of	Rain drop pattern	11	ND

APPENDIX A. SUMMARY OF MATERIALS SAMPLED FOR ASBESTOS
BLACK PINE MINE

Sample	Location	Material	HM*	Result
	shower hall	ceiling tile		
CMN-ASB-31	Southern building; N end of W side	Spray pattern ceiling tiles	12	ND
CMN-ASB-32	Southern building; Central portion of W side	Spray pattern ceiling tiles	12	ND
CMN-ASB-33	Southern building; S end of W side	Spray pattern ceiling tiles	12	ND
Tim Smith Mine AOC				
HM-ASB-43[b]	Spring house on south side of Tim Smith No. 1 Adit access road	Green composite roofing	13	ND
HM-ASB-44[b]	Spring house on south side of Tim Smith No. 1 Adit access road	Green composite roofing	13	ND
HM-ASB-45[b]	Tim Smith No. 1 Adit north building; north side	Corrugated fiberglass siding	14	ND
Historic Mine Area AOC				
HM-ASB-01	Lewis Shaft building, entrance	Silver foil vapor barrier	15	ND
HM-ASB-02	Lewis Shaft building, entrance	Silver foil vapor barrier	15	ND
HM-ASB-03	Lewis Shaft garage, entrance	Silver foil vapor barrier	15	ND
HM-ASB-34	Small structure on east side of BPM access road, south of Harper Shaft	Purplish brown vent sealant	16	ND
HM-ASB-35	**Harrison Shaft rubble (collapsed)**	**Grout**	**17**	**60% Chrysotile**

APPENDIX A. SUMMARY OF MATERIALS SAMPLED FOR ASBESTOS
BLACK PINE MINE

Sample	Location	Material	HM*	Result
HM-ASB-40	Lewis Shaft building, chimney	Chimney brick grout	18	ND
HM-ASB-41	Lewis Shaft garage building, south side	Corrugated fiberglass siding	19	ND
HM-ASB-42	Lewis Shaft garage building, north side	Corrugated fiberglass siding	19	ND
Combination Mill Area				
CML-ASB-36	Pump house at bridge	Black vapor barrier	20	ND
CML-ASB-37	Old mill site (collapsed)	Brick grout (upper half)	21	ND
CML-ASB-38	Old mill site (collapsed)	Rock grout (lower half)	22	ND
CML-ASB-39	Combination mill site (collapsed)	Grout	23	ND

[a] – Sample labeled on laboratory chain-of-custody as **CNM**-ASB-## instead of **CMN**-ASB-##.

[b]- Sample labeled on laboratory chain-of-custody as **HM**-ASB-## instead of **TS**-ASB-##.

AOC – Area of Concern

CML – Combination Mill

CMN – Combination Mine

TS – Tim Smith Mine

HM – Historic Mine

HM* – homogenous material/unique material number

ND – none detected

APPENDIX B

ANALYTICAL RESULTS

B1 SOLID-MATRIX ANALYTICAL RESULTS, COMBINATION MINE AOC
B2 SURFACE WATER-MATRIX ANALYTICAL RESULTS, COMBINATION MINE AOC
B3 GROUNDWATER ANALYTICAL RESULTS, COMBINATION MINE AOC
B4 SOLID-MATRIX ANALYTICAL RESULTS, TIM SMITH MINE AOC
B5 SURFACE WATER-MATRIX ANALYTICAL RESULTS, TIM SMITH MINE AOC
B6 SOLID-MATRIX ANALYTICAL RESULTS, HISTORIC MINE AOC
B7 SURFACE WATER-MATRIX ANALYTICAL RESULTS, HISTORIC MINE AOC
B8 SOLID-MATRIX ANALYTICAL RESULTS, COMBINATION MILL AOC
B9 SURFACE WATER-MATRIX ANALYTICAL RESULTS, COMBINATION MILL AOC
B10 RCRA METALS ANALYTICAL RESULTS, COMBINATION MILL AOC
B11 QUALITY ASSURANCE/QUALITY CONTROL ANALYTICAL RESULTS
B12 SOLID-MATRIX ANALYTICAL RESULTS, REPOSITORY

APPENDIX B1

SOLID-MATRIX ANALYTICAL RESULTS, COMBINATION MINE AOC

APPENDIX B-1. SOLID-MATRIX ANALYTICAL RESULTS
COMBINATION MINE AOC
BLACK PINE MINE

Location	Sample ID	Field Sample ID	Lab Batch ID	Lab Sample ID	Date Sampled	Matrix	X	Y	Sample Start Depth	Sample End Depth	Tri Cas	Analyte[a]	Value	r Qualifier	Units
CMN-RS-04	CMN-RS-04 (2-4 ft)	BP-CMN-RS-04-02	10163634	10163634002	7/14/2011	Soil	995701.2516	823155.6623	2	4	MOISTURE	Soil Moisture	35.4		%
											SULFUR_EX_HCL	Sulfur (HCL Extraction)	0.132		%
											SULFUR_EX_HNO3	Sulfur (HNO3 Extraction)	ND(0.05)		%
											SULFUR_HOTWATER_HNO3	Sulfur (Hot Water Extraction)	0.223		%
											SULFUR_RES	Sulfur, Residual	ND(0.05)		%
											SULFUR	Sulfur, Total	0.415		%
											SB_T_R	Antimony, Total Recoverable	424		mg/kg
											AS_T_R	Arsenic, Total Recoverable	216		mg/kg
											BA_T_R	Barium, Total Recoverable	92.2		mg/kg
											CD_T_R	Cadmium, Total Recoverable	3.7		mg/kg
											CR_T_R	Chromium, Total Recoverable	1.3		mg/kg
											CO_T_R	Cobalt, Total Recoverable	ND(0.76)		mg/kg
											CU_T_R	Copper, Total Recoverable	309		mg/kg
											FE_T_R	Iron, Total Recoverable	9400		mg/kg
											PB_T_R	Lead, Total Recoverable	1910		mg/kg
											MN_T_R	Manganese, Total Recoverable	110		mg/kg
											HG_T_R	Mercury, Total Recoverable	0.28 J	J	mg/kg
											NI_T_R	Nickel, Total Recoverable	1.5		mg/kg
											AG_T_R	Silver, Total Recoverable	50.2		mg/kg
											ZN_T_R	Zinc, Total Recoverable	423		mg/kg
											PH_SMPBUFFER	pH, SMP Buffer	6.8		Std Units
											ACIDBASE_POT	Acid Base Potential	-5		t/1000t
											ACIDITY_POT	Acid Potential	5		t/1000t
											NEUT_POT	Neutralization Potential	ND(0.5)	UJ	t/1000t
											01305-78-8_REC	Recommended Lime	7.5		t/1000t
											SMPLIME_REQ	SMP Lime Requirement	1		t/1000t
CMN-RS-04	CMN-RS-04 (5-7 ft)	BP-CMN-RS-04-05	10163634	10163634003	7/14/2011	Soil	995701.2516	823155.6623	5	7	MOISTURE	Soil Moisture	34.4		%
											SULFUR_EX_HCL	Sulfur (HCL Extraction)	0.127		%
											SULFUR_EX_HNO3	Sulfur (HNO3 Extraction)	0.108		%
											SULFUR_HOTWATER_HNO3	Sulfur (Hot Water Extraction)	0.276		%
											SULFUR_RES	Sulfur, Residual	ND(0.05)		%
											SULFUR	Sulfur, Total	0.512		%
											SB_T_R	Antimony, Total Recoverable	986		mg/kg
											AS_T_R	Arsenic, Total Recoverable	439		mg/kg
											BA_T_R	Barium, Total Recoverable	114		mg/kg
											CD_T_R	Cadmium, Total Recoverable	10.2		mg/kg
											CR_T_R	Chromium, Total Recoverable	0.9		mg/kg
											CO_T_R	Cobalt, Total Recoverable	ND(0.73)		mg/kg
											CU_T_R	Copper, Total Recoverable	464		mg/kg
											FE_T_R	Iron, Total Recoverable	19400		mg/kg
											PB_T_R	Lead, Total Recoverable	2750		mg/kg
											MN_T_R	Manganese, Total Recoverable	36.8		mg/kg
											HG_T_R	Mercury, Total Recoverable	0.13 J	J	mg/kg
											NI_T_R	Nickel, Total Recoverable	1.1		mg/kg
											AG_T_R	Silver, Total Recoverable	155		mg/kg
											ZN_T_R	Zinc, Total Recoverable	1040		mg/kg
											PH_SMPBUFFER	pH, SMP Buffer	6.8		Std Units
											ACIDBASE_POT	Acid Base Potential	-6.4		t/1000t
											ACIDITY_POT	Acid Potential	6.4		t/1000t
											NEUT_POT	Neutralization Potential	ND(0.5)	UJ	t/1000t
											01305-78-8_REC	Recommended Lime	9.2		t/1000t
											SMPLIME_REQ	SMP Lime Requirement	1		t/1000t

APPENDIX B-1. SOLID-MATRIX ANALYTICAL RESULTS
COMBINATION MINE AOC
BLACK PINE MINE

Location	Sample ID	Field Sample ID	Lab Batch ID	Lab Sample ID	Date Sampled	Matrix	X	Y	Sample Start Depth	Sample End Depth	Tri Cas	Analyte[a]	Value	r Qualifier	Units
CMN-RS-05	CMN-RS-05 (5-7 ft)	BP-CMN-RS-05-05	10163633	10163633008	7/14/2011	Soil	995520.7678	822481.2171	5	7	MOISTURE	Soil Moisture	7.9		%
											SULFUR_EX_HCL	Sulfur (HCL Extraction)	ND(0.05)		%
											SULFUR_EX_HNO3	Sulfur (HNO3 Extraction)	0.134		%
											SULFUR_HOTWATER_HNO3	Sulfur (Hot Water Extraction)	0.237		%
											SULFUR_RES	Sulfur, Residual	ND(0.05)		%
											SULFUR	Sulfur, Total	0.369		%
											SB_T_R	Antimony, Total Recoverable	678		mg/kg
											AS_T_R	Arsenic, Total Recoverable	467		mg/kg
											BA_T_R	Barium, Total Recoverable	244		mg/kg
											CD_T_R	Cadmium, Total Recoverable	13.7		mg/kg
											CR_T_R	Chromium, Total Recoverable	3		mg/kg
											CO_T_R	Cobalt, Total Recoverable	4.1 J	J	mg/kg
											CU_T_R	Copper, Total Recoverable	1950		mg/kg
											FE_T_R	Iron, Total Recoverable	12500		mg/kg
											PB_T_R	Lead, Total Recoverable	3050		mg/kg
											MN_T_R	Manganese, Total Recoverable	850		mg/kg
											HG_T_R	Mercury, Total Recoverable	0.27 J	J	mg/kg
											NI_T_R	Nickel, Total Recoverable	4.4		mg/kg
											AG_T_R	Silver, Total Recoverable	69		mg/kg
											ZN_T_R	Zinc, Total Recoverable	923		mg/kg
											PH_SMPBUFFER	pH, SMP Buffer	7.4		Std Units
											ACIDBASE_POT	Acid Base Potential	1.6		t/1000t
											ACIDITY_POT	Acid Potential	4.4		t/1000t
											NEUT_POT	Neutralization Potential	6.1		t/1000t
											01305-78-8_REC	Recommended Lime	5.6		t/1000t
											SMPLIME_REQ	SMP Lime Requirement	0		t/1000t
CMN-RS-06	CMN-RS-06 (2-4 ft)	BP-CMN-RS-06-02	10163633	10163633011	7/14/2011	Soil	995669.1155	822435.624	2	4	MOISTURE	Soil Moisture	7.5		%
											SULFUR_EX_HCL	Sulfur (HCL Extraction)	0.0778		%
											SULFUR_EX_HNO3	Sulfur (HNO3 Extraction)	0.144		%
											SULFUR_HOTWATER_HNO3	Sulfur (Hot Water Extraction)	0.169		%
											SULFUR_RES	Sulfur, Residual	ND(0.05)		%
											SULFUR	Sulfur, Total	0.396		%
											SB_T_R	Antimony, Total Recoverable	765		mg/kg
											AS_T_R	Arsenic, Total Recoverable	515		mg/kg
											BA_T_R	Barium, Total Recoverable	168		mg/kg
											CD_T_R	Cadmium, Total Recoverable	14.9		mg/kg
											CR_T_R	Chromium, Total Recoverable	4.1		mg/kg
											CO_T_R	Cobalt, Total Recoverable	2.5 J	J	mg/kg
											CU_T_R	Copper, Total Recoverable	1690		mg/kg
											FE_T_R	Iron, Total Recoverable	14400		mg/kg
											PB_T_R	Lead, Total Recoverable	3820		mg/kg
											MN_T_R	Manganese, Total Recoverable	652		mg/kg
											HG_T_R	Mercury, Total Recoverable	0.26 J	J	mg/kg
											NI_T_R	Nickel, Total Recoverable	3.9		mg/kg
											AG_T_R	Silver, Total Recoverable	87.6		mg/kg
											ZN_T_R	Zinc, Total Recoverable	1150		mg/kg
											PH_SMPBUFFER	pH, SMP Buffer	7.4		Std Units
											ACIDBASE_POT	Acid Base Potential	4.2		t/1000t
											ACIDITY_POT	Acid Potential	6.5		t/1000t
											NEUT_POT	Neutralization Potential	11		t/1000t
											01305-78-8_REC	Recommended Lime	8.1		t/1000t
											SMPLIME_REQ	SMP Lime Requirement	0		t/1000t

APPENDIX B-1. SOLID-MATRIX ANALYTICAL RESULTS
COMBINATION MINE AOC
BLACK PINE MINE

Location	Sample ID	Field Sample ID	Lab Batch ID	Lab Sample ID	Date Sampled	Matrix	X	Y	Sample Start Depth	Sample End Depth	Tri Cas	Analyte[a]	Value	r Qualifier	Units
CMN-SS-04	CMN-SS-04 (0-1 ft)	BP-CMN-SS-04-00	10163634	10163634001	7/14/2011	Soil	995701.2516	823155.6623	0	1	MOISTURE	Soil Moisture	10.8		%
											SULFUR_EX_HCL	Sulfur (HCL Extraction)	ND(0.05)		%
											SULFUR_EX_HNO3	Sulfur (HNO3 Extraction)	ND(0.05)		%
											SULFUR_HOTWATER_HNO3	Sulfur (Hot Water Extraction)	ND(0.05)		%
											SULFUR_RES	Sulfur, Residual	ND(0.05)		%
											SULFUR	Sulfur, Total	ND(0.05)		%
											SB_T_R	Antimony, Total Recoverable	26.2		mg/kg
											AS_T_R	Arsenic, Total Recoverable	35		mg/kg
											BA_T_R	Barium, Total Recoverable	180		mg/kg
											CD_T_R	Cadmium, Total Recoverable	0.39		mg/kg
											CR_T_R	Chromium, Total Recoverable	4.1		mg/kg
											CO_T_R	Cobalt, Total Recoverable	3.7 J	J	mg/kg
											CU_T_R	Copper, Total Recoverable	57.8		mg/kg
											FE_T_R	Iron, Total Recoverable	8820		mg/kg
											PB_T_R	Lead, Total Recoverable	261		mg/kg
											MN_T_R	Manganese, Total Recoverable	480		mg/kg
											HG_T_R	Mercury, Total Recoverable	ND(0.02)	UJ	mg/kg
											NI_T_R	Nickel, Total Recoverable	4.8		mg/kg
											AG_T_R	Silver, Total Recoverable	1		mg/kg
											ZN_T_R	Zinc, Total Recoverable	81.5		mg/kg
											PH_SMPBUFFER	pH, SMP Buffer	7.3		Std Units
											ACIDBASE_POT	Acid Base Potential	3		t/1000t
											ACIDITY_POT	Acid Potential	ND(4.3)		t/1000t
											NEUT_POT	Neutralization Potential	0.73 J	J	t/1000t
											01305-78-8_REC	Recommended Lime	ND(5.4)		t/1000t
											SMPLIME_REQ	SMP Lime Requirement	0		t/1000t
CMN-SS-04	CMN-SS-04 (8-10 ft)	BP-CMN-SS-04-08	10163634	10163634004	7/14/2011	Soil	995701.2516	823155.6623	8	10	MOISTURE	Soil Moisture	12.6		%
											SB_T_R	Antimony, Total Recoverable	0.74		mg/kg
											AS_T_R	Arsenic, Total Recoverable	7.9		mg/kg
											BA_T_R	Barium, Total Recoverable	63		mg/kg
											CD_T_R	Cadmium, Total Recoverable	0.11		mg/kg
											CR_T_R	Chromium, Total Recoverable	3.7		mg/kg
											CO_T_R	Cobalt, Total Recoverable	1.4 J	J	mg/kg
											CU_T_R	Copper, Total Recoverable	26.8		mg/kg
											FE_T_R	Iron, Total Recoverable	5680		mg/kg
											PB_T_R	Lead, Total Recoverable	5.3		mg/kg
											MN_T_R	Manganese, Total Recoverable	56.9		mg/kg
											HG_T_R	Mercury, Total Recoverable	ND(0.023)	UJ	mg/kg
											NI_T_R	Nickel, Total Recoverable	2.5		mg/kg
											AG_T_R	Silver, Total Recoverable	ND(0.56)		mg/kg
											ZN_T_R	Zinc, Total Recoverable	17.7		mg/kg

APPENDIX B-1. SOLID-MATRIX ANALYTICAL RESULTS
COMBINATION MINE AOC
BLACK PINE MINE

Location	Sample ID	Field Sample ID	Lab Batch ID	Lab Sample ID	Date Sampled	Matrix	X	Y	Sample Start Depth	Sample End Depth	Tri Cas	Analyte[a]	Value	r Qualifier	Units
CMN-SS-05	CMN-SS-05 (0-1 ft)	BP-CMN-SS-05-00	10163633	10163633009	7/14/2011	Soil	995520.7678	822481.2171	0	1	MOISTURE	Soil Moisture	11.5		%
											SULFUR_EX_HCL	Sulfur (HCL Extraction)	ND(0.05)		%
											SULFUR_EX_HNO3	Sulfur (HNO3 Extraction)	ND(0.05)		%
											SULFUR_HOTWATER_HNO3	Sulfur (Hot Water Extraction)	ND(0.05)		%
											SULFUR_RES	Sulfur, Residual	ND(0.05)		%
											SULFUR	Sulfur, Total	ND(0.05)		%
											SB_T_R	Antimony, Total Recoverable	20.2		mg/kg
											AS_T_R	Arsenic, Total Recoverable	26.1		mg/kg
											BA_T_R	Barium, Total Recoverable	298		mg/kg
											CD_T_R	Cadmium, Total Recoverable	0.37		mg/kg
											CR_T_R	Chromium, Total Recoverable	4.8		mg/kg
											CO_T_R	Cobalt, Total Recoverable	6.1 J	J	mg/kg
											CU_T_R	Copper, Total Recoverable	73.6		mg/kg
											FE_T_R	Iron, Total Recoverable	8450		mg/kg
											PB_T_R	Lead, Total Recoverable	282		mg/kg
											MN_T_R	Manganese, Total Recoverable	928		mg/kg
											HG_T_R	Mercury, Total Recoverable	ND(0.021)	UJ	mg/kg
											NI_T_R	Nickel, Total Recoverable	4.9		mg/kg
											AG_T_R	Silver, Total Recoverable	1		mg/kg
											ZN_T_R	Zinc, Total Recoverable	88		mg/kg
											PH_SMPBUFFER	pH, SMP Buffer	7.3		Std Units
											ACIDBASE_POT	Acid Base Potential	0		t/1000t
											ACIDITY_POT	Acid Potential	ND(4.3)		t/1000t
											NEUT_POT	Neutralization Potential	ND(0.5)		t/1000t
											01305-78-8_REC	Recommended Lime	ND(5.4)		t/1000t
											SMPLIME_REQ	SMP Lime Requirement	0		t/1000t
CMN-SS-05	CMN-SS-05 (8-10 ft)	BP-CMN-SS-05-08	10163633	10163633007	7/14/2011	Soil	995520.7678	822481.2171	8	10	MOISTURE	Soil Moisture	11.8		%
											SB_T_R	Antimony, Total Recoverable	1.4		mg/kg
											AS_T_R	Arsenic, Total Recoverable	7.7		mg/kg
											BA_T_R	Barium, Total Recoverable	97		mg/kg
											CD_T_R	Cadmium, Total Recoverable	ND(0.08)		mg/kg
											CR_T_R	Chromium, Total Recoverable	6.7		mg/kg
											CO_T_R	Cobalt, Total Recoverable	5.4 J	J	mg/kg
											CU_T_R	Copper, Total Recoverable	8.7		mg/kg
											FE_T_R	Iron, Total Recoverable	7960		mg/kg
											PB_T_R	Lead, Total Recoverable	14.9		mg/kg
											MN_T_R	Manganese, Total Recoverable	137		mg/kg
											HG_T_R	Mercury, Total Recoverable	ND(0.022)	UJ	mg/kg
											NI_T_R	Nickel, Total Recoverable	5.8		mg/kg
											AG_T_R	Silver, Total Recoverable	ND(0.5)		mg/kg
											ZN_T_R	Zinc, Total Recoverable	25.7		mg/kg

APPENDIX B-1. SOLID-MATRIX ANALYTICAL RESULTS
COMBINATION MINE AOC
BLACK PINE MINE

Location	Sample ID	Field Sample ID	Lab Batch ID	Lab Sample ID	Date Sampled	Matrix	X	Y	Sample Start Depth	Sample End Depth	Tri Cas	Analyte[a]	Value	r Qualifier	Units
CMN-SS-06	CMN-SS-06 (0-1 ft)	BP-CMN-SS-06-00	10163633	10163633012	7/14/2011	Soil	995669.1155	822435.624	0	1	MOISTURE	Soil Moisture	10.7		%
											SULFUR_EX_HCL	Sulfur (HCL Extraction)	ND(0.05)		%
											SULFUR_EX_HNO3	Sulfur (HNO3 Extraction)	ND(0.05)		%
											SULFUR_HOTWATER_HNO3	Sulfur (Hot Water Extraction)	ND(0.05)		%
											SULFUR_RES	Sulfur, Residual	ND(0.05)		%
											SULFUR	Sulfur, Total	ND(0.05)		%
											SB_T_R	Antimony, Total Recoverable	15.4		mg/kg
											AS_T_R	Arsenic, Total Recoverable	22.3		mg/kg
											BA_T_R	Barium, Total Recoverable	177		mg/kg
											CD_T_R	Cadmium, Total Recoverable	0.54		mg/kg
											CR_T_R	Chromium, Total Recoverable	4.1		mg/kg
											CO_T_R	Cobalt, Total Recoverable	7.8 J	J	mg/kg
											CU_T_R	Copper, Total Recoverable	57.5		mg/kg
											FE_T_R	Iron, Total Recoverable	6670		mg/kg
											PB_T_R	Lead, Total Recoverable	217		mg/kg
											MN_T_R	Manganese, Total Recoverable	910		mg/kg
											HG_T_R	Mercury, Total Recoverable	ND(0.022)	UJ	mg/kg
											NI_T_R	Nickel, Total Recoverable	ND(8.7)		mg/kg
											AG_T_R	Silver, Total Recoverable	1.6		mg/kg
											ZN_T_R	Zinc, Total Recoverable	321		mg/kg
											PH_SMPBUFFER	pH, SMP Buffer	7.3		Std Units
											ACIDBASE_POT	Acid Base Potential	0.9		t/1000t
											ACIDITY_POT	Acid Potential	ND(4.3)		t/1000t
											NEUT_POT	Neutralization Potential	0.94		t/1000t
											01305-78-8_REC	Recommended Lime	ND(5.4)		t/1000t
											SMPLIME_REQ	SMP Lime Requirement	0		t/1000t
CMN-SS-06	CMN-SS-06 (6-8 ft)	BP-CMN-SS-06-06	10163633	10163633010	7/14/2011	Soil	995669.1155	822435.624	6	8	MOISTURE	Soil Moisture	10.9		%
											SB_T_R	Antimony, Total Recoverable	2.1		mg/kg
											AS_T_R	Arsenic, Total Recoverable	7		mg/kg
											BA_T_R	Barium, Total Recoverable	67.9		mg/kg
											CD_T_R	Cadmium, Total Recoverable	0.25		mg/kg
											CR_T_R	Chromium, Total Recoverable	5.9		mg/kg
											CO_T_R	Cobalt, Total Recoverable	7 J	J	mg/kg
											CU_T_R	Copper, Total Recoverable	8.8		mg/kg
											FE_T_R	Iron, Total Recoverable	6890		mg/kg
											PB_T_R	Lead, Total Recoverable	19		mg/kg
											MN_T_R	Manganese, Total Recoverable	342		mg/kg
											HG_T_R	Mercury, Total Recoverable	ND(0.02)	UJ	mg/kg
											NI_T_R	Nickel, Total Recoverable	8		mg/kg
											AG_T_R	Silver, Total Recoverable	ND(0.48)		mg/kg
											ZN_T_R	Zinc, Total Recoverable	37.9		mg/kg

APPENDIX B-1. SOLID-MATRIX ANALYTICAL RESULTS
COMBINATION MINE AOC
BLACK PINE MINE

Location	Sample ID	Field Sample ID	Lab Batch ID	Lab Sample ID	Date Sampled	Matrix	X	Y	Sample Start Depth	Sample End Depth	Tri Cas	Analyte[a]	Value	r Qualifier	Units
CMN-SS-07	CMN-SS-07 (0-1 ft)	BP-CMN-SS-07-00	10163634	10163634005	7/14/2011	Soil	996112.58	822825.573	0	1	MOISTURE	Soil Moisture	8.6		%
											SULFUR_EX_HCL	Sulfur (HCL Extraction)	ND(0.05)		%
											SULFUR_EX_HNO3	Sulfur (HNO3 Extraction)	ND(0.05)		%
											SULFUR_HOTWATER_HNO3	Sulfur (Hot Water Extraction)	ND(0.05)		%
											SULFUR_RES	Sulfur, Residual	ND(0.05)		%
											SULFUR	Sulfur, Total	ND(0.05)		%
											SB_T_R	Antimony, Total Recoverable	1.5		mg/kg
											AS_T_R	Arsenic, Total Recoverable	12.2		mg/kg
											BA_T_R	Barium, Total Recoverable	85.4		mg/kg
											CD_T_R	Cadmium, Total Recoverable	0.41		mg/kg
											CR_T_R	Chromium, Total Recoverable	12.2		mg/kg
											CO_T_R	Cobalt, Total Recoverable	6.6 J	J	mg/kg
											CU_T_R	Copper, Total Recoverable	30.9		mg/kg
											FE_T_R	Iron, Total Recoverable	15300		mg/kg
											PB_T_R	Lead, Total Recoverable	19.7		mg/kg
											MN_T_R	Manganese, Total Recoverable	252		mg/kg
											HG_T_R	Mercury, Total Recoverable	ND(0.021)	UJ	mg/kg
											NI_T_R	Nickel, Total Recoverable	8.2		mg/kg
											AG_T_R	Silver, Total Recoverable	ND(0.55)		mg/kg
											ZN_T_R	Zinc, Total Recoverable	57		mg/kg
											PH_SMPBUFFER	pH, SMP Buffer	7.1		Std Units
											ACIDBASE_POT	Acid Base Potential	1.2		t/1000t
											ACIDITY_POT	Acid Potential	ND(4.3)		t/1000t
											NEUT_POT	Neutralization Potential	1.2 J	J	t/1000t
											01305-78-8_REC	Recommended Lime	ND(5.4)		t/1000t
											SMPLIME_REQ	SMP Lime Requirement	0		t/1000t
CMN-SS-07	CMN-SS-07 (6-7 ft)	BP-CMN-SS-07-06	10163634	10163634006	7/14/2011	Soil	996112.58	822825.573	6	7	FRAG_COARSE	Coarse Fragments	19.3		%
											OM	Organic Matter	ND(0.1)		%
											MOISTURE	Soil Moisture	10.3		%
											SULFUR_EX_HCL	Sulfur (HCL Extraction)	ND(0.05)		%
											SULFUR_EX_HNO3	Sulfur (HNO3 Extraction)	ND(0.05)		%
											SULFUR_HOTWATER_HNO3	Sulfur (Hot Water Extraction)	ND(0.05)		%
											SULFUR_RES	Sulfur, Residual	ND(0.05)		%
											SULFUR	Sulfur, Total	ND(0.05)		%
											CEC	Cation Exchange Capacity	22.1		meq/100g
											SB_T_R	Antimony, Total Recoverable	1.3		mg/kg
											AS_T_R	Arsenic, Total Recoverable	12.4		mg/kg
											BA_T_R	Barium, Total Recoverable	111		mg/kg
											CD_T_R	Cadmium, Total Recoverable	ND(0.088)		mg/kg
											CR_T_R	Chromium, Total Recoverable	11.9		mg/kg
											CO_T_R	Cobalt, Total Recoverable	10.3 J	J	mg/kg
											CU_T_R	Copper, Total Recoverable	14.9		mg/kg
											FE_T_R	Iron, Total Recoverable	14000		mg/kg
											PB_T_R	Lead, Total Recoverable	24.8		mg/kg
											MN_T_R	Manganese, Total Recoverable	393		mg/kg
											HG_T_R	Mercury, Total Recoverable	ND(0.02)	UJ	mg/kg
											NI_T_R	Nickel, Total Recoverable	9.7		mg/kg
											N_NO3	Nitrogen, Nitrate	ND(5)		mg/kg
											P_AVAIL	Phosphorous, Available	ND(1)		mg/kg
											K	Potassium, Total	ND(122)		mg/kg
											AG_T_R	Silver, Total Recoverable	ND(0.55)		mg/kg
											ZN_T_R	Zinc, Total Recoverable	30.5		mg/kg
											PH_SATPASTE	pH, Saturated Paste	7.2		Std Units
											PH_SMPBUFFER	pH, SMP Buffer	6.8		Std Units
											ACIDBASE_POT	Acid Base Potential	2		t/1000t
											ACIDITY_POT	Acid Potential	ND(4.3)		t/1000t
											NEUT_POT	Neutralization Potential	2 J	J	t/1000t
											01305-78-8_REC	Recommended Lime	ND(5.4)		t/1000t
											SMPLIME_REQ	SMP Lime Requirement	0.3		t/1000t

APPENDIX B-1. SOLID-MATRIX ANALYTICAL RESULTS
COMBINATION MINE AOC
BLACK PINE MINE

Location	Sample ID	Field Sample ID	Lab Batch ID	Lab Sample ID	Date Sampled	Matrix	X	Y	Sample Start Depth	Sample End Depth	Tri Cas	Analyte[a]	Value	r Qualifier	Units
CMN-SS-08	CMN-SS-08 (0-1 ft)	BP-CMN-SS-08-00	10163634	10163634007	7/14/2011	Soil	996341.4152	822740.7253	0	1	MOISTURE	Soil Moisture	16.4		%
											SULFUR_EX_HCL	Sulfur (HCL Extraction)	ND(0.05)		%
											SULFUR_EX_HNO3	Sulfur (HNO3 Extraction)	ND(0.05)		%
											SULFUR_HOTWATER_HNO3	Sulfur (Hot Water Extraction)	ND(0.05)		%
											SULFUR_RES	Sulfur, Residual	ND(0.05)		%
											SULFUR	Sulfur, Total	ND(0.05)		%
											SB_T_R	Antimony, Total Recoverable	3.3		mg/kg
											AS_T_R	Arsenic, Total Recoverable	14.4		mg/kg
											BA_T_R	Barium, Total Recoverable	64.7		mg/kg
											CD_T_R	Cadmium, Total Recoverable	1.6		mg/kg
											CR_T_R	Chromium, Total Recoverable	7.6		mg/kg
											CO_T_R	Cobalt, Total Recoverable	8.2 J	J	mg/kg
											CU_T_R	Copper, Total Recoverable	220		mg/kg
											FE_T_R	Iron, Total Recoverable	11000		mg/kg
											PB_T_R	Lead, Total Recoverable	24.4		mg/kg
											MN_T_R	Manganese, Total Recoverable	419		mg/kg
											HG_T_R	Mercury, Total Recoverable	ND(0.022)	UJ	mg/kg
											NI_T_R	Nickel, Total Recoverable	4.8		mg/kg
											AG_T_R	Silver, Total Recoverable	ND(0.6)		mg/kg
											ZN_T_R	Zinc, Total Recoverable	101		mg/kg
											PH_SMPBUFFER	pH, SMP Buffer	7		Std Units
											ACIDBASE_POT	Acid Base Potential	1.7		t/1000t
											ACIDITY_POT	Acid Potential	ND(4.3)		t/1000t
											NEUT_POT	Neutralization Potential	1.7 J	J	t/1000t
											01305-78-8_REC	Recommended Lime	ND(5.4)		t/1000t
											SMPLIME_REQ	SMP Lime Requirement	0		t/1000t
CMN-SS-08	CMN-SS-08 (3-5 ft)	BP-CMN-SS-08-03	10163634	10163634008	7/14/2011	Soil	996341.4152	822740.7253	3	5	FRAG_COARSE	Coarse Fragments	19.3		%
											OM	Organic Matter	0.13		%
											MOISTURE	Soil Moisture	22.9		%
											SULFUR_EX_HCL	Sulfur (HCL Extraction)	ND(0.05)		%
											SULFUR_EX_HNO3	Sulfur (HNO3 Extraction)	ND(0.05)		%
											SULFUR_HOTWATER_HNO3	Sulfur (Hot Water Extraction)	ND(0.05)		%
											SULFUR_RES	Sulfur, Residual	ND(0.05)		%
											SULFUR	Sulfur, Total	ND(0.05)		%
											CEC	Cation Exchange Capacity	22.1		meq/100g
											SB_T_R	Antimony, Total Recoverable	1.1		mg/kg
											AS_T_R	Arsenic, Total Recoverable	7.6		mg/kg
											BA_T_R	Barium, Total Recoverable	136		mg/kg
											CD_T_R	Cadmium, Total Recoverable	0.71		mg/kg
											CR_T_R	Chromium, Total Recoverable	8.4		mg/kg
											CO_T_R	Cobalt, Total Recoverable	5.2 J	J	mg/kg
											CU_T_R	Copper, Total Recoverable	124		mg/kg
											FE_T_R	Iron, Total Recoverable	10300		mg/kg
											PB_T_R	Lead, Total Recoverable	14.8		mg/kg
											MN_T_R	Manganese, Total Recoverable	193		mg/kg
											HG_T_R	Mercury, Total Recoverable	ND(0.021)	R	mg/kg
											NI_T_R	Nickel, Total Recoverable	5.6		mg/kg
											N_NO3	Nitrogen, Nitrate	ND(5)		mg/kg
											P_AVAIL	Phosphorous, Available	1.6		mg/kg
											K	Potassium, Total	ND(116)		mg/kg
											AG_T_R	Silver, Total Recoverable	ND(0.62)		mg/kg
											ZN_T_R	Zinc, Total Recoverable	62.7		mg/kg
											SPCON_SATPASTE	Specific Conductance, Saturated Paste	323 J	J	mmhos/cm
											PH_SATPASTE	pH, Saturated Paste	6.8		Std Units
											PH_SMPBUFFER	pH, SMP Buffer	6.8		Std Units
											ACIDBASE_POT	Acid Base Potential	1.7		t/1000t
											ACIDITY_POT	Acid Potential	ND(4.3)		t/1000t
											NEUT_POT	Neutralization Potential	1.7 J	J	t/1000t
											01305-78-8_REC	Recommended Lime	ND(5.4)		t/1000t
											SMPLIME_REQ	SMP Lime Requirement	1		t/1000t

APPENDIX B-1. SOLID-MATRIX ANALYTICAL RESULTS
COMBINATION MINE AOC
BLACK PINE MINE

Location	Sample ID	Field Sample ID	Lab Batch ID	Lab Sample ID	Date Sampled	Matrix	X	Y	Sample Start Depth	Sample End Depth	Tri Cas	Analyte[a]	Value	r Qualifier	Units
CMN-SS-09	CMN-SS-09 (0-1 ft)	BP-CMN-SS-09-00	10163634	10163634009	7/14/2011	Soil	996496.0929	822603.4628	0	1	MOISTURE	Soil Moisture	16.4		%
											SULFUR_EX_HCL	Sulfur (HCL Extraction)	ND(0.05)		%
											SULFUR_EX_HNO3	Sulfur (HNO3 Extraction)	ND(0.05)		%
											SULFUR_HOTWATER_HNO3	Sulfur (Hot Water Extraction)	ND(0.05)		%
											SULFUR_RES	Sulfur, Residual	ND(0.05)		%
											SULFUR	Sulfur, Total	ND(0.05)		%
											SB_T_R	Antimony, Total Recoverable	1.4		mg/kg
											AS_T_R	Arsenic, Total Recoverable	9.7		mg/kg
											BA_T_R	Barium, Total Recoverable	250		mg/kg
											CD_T_R	Cadmium, Total Recoverable	2.7		mg/kg
											CR_T_R	Chromium, Total Recoverable	7.8		mg/kg
											CO_T_R	Cobalt, Total Recoverable	6 J	J	mg/kg
											CU_T_R	Copper, Total Recoverable	489		mg/kg
											FE_T_R	Iron, Total Recoverable	8270		mg/kg
											PB_T_R	Lead, Total Recoverable	21		mg/kg
											MN_T_R	Manganese, Total Recoverable	460		mg/kg
											HG_T_R	Mercury, Total Recoverable	0.12 J	J	mg/kg
											NI_T_R	Nickel, Total Recoverable	5.3		mg/kg
											AG_T_R	Silver, Total Recoverable	0.66		mg/kg
											ZN_T_R	Zinc, Total Recoverable	131		mg/kg
											PH_SMPBUFFER	pH, SMP Buffer	6.4		Std Units
											ACIDBASE_POT	Acid Base Potential	1.2		t/1000t
											ACIDITY_POT	Acid Potential	ND(4.3)		t/1000t
											NEUT_POT	Neutralization Potential	1.2 J	J	t/1000t
											01305-78-8_REC	Recommended Lime	ND(5.4)		t/1000t
											SMPLIME_REQ	SMP Lime Requirement	3.9		t/1000t
CMN-SS-09	CMN-SS-09 (4-6 ft)	BP-CMN-SS-09-04	10163634	10163634010	7/14/2011	Soil	996496.0929	822603.4628	4	6	FRAG_COARSE	Coarse Fragments	22.1		%
											OM	Organic Matter	ND(0.1)		%
											MOISTURE	Soil Moisture	11.6		%
											SULFUR_EX_HCL	Sulfur (HCL Extraction)	ND(0.05)		%
											SULFUR_EX_HNO3	Sulfur (HNO3 Extraction)	ND(0.05)		%
											SULFUR_HOTWATER_HNO3	Sulfur (Hot Water Extraction)	ND(0.05)		%
											SULFUR_RES	Sulfur, Residual	ND(0.05)		%
											SULFUR	Sulfur, Total	ND(0.05)		%
											CEC	Cation Exchange Capacity	16.3		meq/100g
											SB_T_R	Antimony, Total Recoverable	0.67		mg/kg
											AS_T_R	Arsenic, Total Recoverable	8.1		mg/kg
											BA_T_R	Barium, Total Recoverable	185		mg/kg
											CD_T_R	Cadmium, Total Recoverable	1.7		mg/kg
											CR_T_R	Chromium, Total Recoverable	12.1		mg/kg
											CO_T_R	Cobalt, Total Recoverable	11.2 J	J	mg/kg
											CU_T_R	Copper, Total Recoverable	58.4		mg/kg
											FE_T_R	Iron, Total Recoverable	14400		mg/kg
											PB_T_R	Lead, Total Recoverable	20.4		mg/kg
											MN_T_R	Manganese, Total Recoverable	243		mg/kg
											HG_T_R	Mercury, Total Recoverable	61.3 J	J	mg/kg
											NI_T_R	Nickel, Total Recoverable	7.1		mg/kg
											N_NO3	Nitrogen, Nitrate	ND(5)		mg/kg
											P_AVAIL	Phosphorous, Available	3.2		mg/kg
											K	Potassium, Total	ND(125)		mg/kg
											AG_T_R	Silver, Total Recoverable	ND(0.57)		mg/kg
											ZN_T_R	Zinc, Total Recoverable	129		mg/kg
											SPCON_SATPASTE	Specific Conductance, Saturated Paste	1 J	J	mmhos/cm
											PH_SATPASTE	pH, Saturated Paste	6.1		Std Units
											PH_SMPBUFFER	pH, SMP Buffer	6.9		Std Units
											ACIDBASE_POT	Acid Base Potential	3.7		t/1000t
											ACIDITY_POT	Acid Potential	ND(4.3)		t/1000t
											NEUT_POT	Neutralization Potential	3.7 J	J	t/1000t
											01305-78-8_REC	Recommended Lime	ND(5.4)		t/1000t
											SMPLIME_REQ	SMP Lime Requirement	0.3		t/1000t

APPENDIX B-1. SOLID-MATRIX ANALYTICAL RESULTS
COMBINATION MINE AOC
BLACK PINE MINE

Location	Sample ID	Field Sample ID	Lab Batch ID	Lab Sample ID	Date Sampled	Matrix	X	Y	Sample Start Depth	Sample End Depth	Tri Cas	Analyte[a]	Value	r Qualifier	Units
CMN-SS-10	CMN-SS-10 (0-1 ft)	BP-CMN-SS-10-00	10163644	10163644001	7/14/2011	Soil	996694.5628	822516.1362	0	1	MOISTURE	Soil Moisture	15		%
											SULFUR_EX_HCL	Sulfur (HCL Extraction)	ND(0.05)		%
											SULFUR_EX_HNO3	Sulfur (HNO3 Extraction)	ND(0.05)		%
											SULFUR_HOTWATER_HNO3	Sulfur (Hot Water Extraction)	ND(0.05)		%
											SULFUR_RES	Sulfur, Residual	ND(0.05)		%
											SULFUR	Sulfur, Total	ND(0.05)		%
											SB_T_R	Antimony, Total Recoverable	15		mg/kg
											AS_T_R	Arsenic, Total Recoverable	8.6		mg/kg
											BA_T_R	Barium, Total Recoverable	237		mg/kg
											CD_T_R	Cadmium, Total Recoverable	1.4 J	J	mg/kg
											CR_T_R	Chromium, Total Recoverable	3.3 J	J	mg/kg
											CO_T_R	Cobalt, Total Recoverable	4.7 J	J	mg/kg
											CU_T_R	Copper, Total Recoverable	139		mg/kg
											FE_T_R	Iron, Total Recoverable	6800		mg/kg
											PB_T_R	Lead, Total Recoverable	15.8		mg/kg
											MN_T_R	Manganese, Total Recoverable	1170		mg/kg
											HG_T_R	Mercury, Total Recoverable	0.044 J	J	mg/kg
											NI_T_R	Nickel, Total Recoverable	6.1		mg/kg
											AG_T_R	Silver, Total Recoverable	1		mg/kg
											ZN_T_R	Zinc, Total Recoverable	93.2		mg/kg
											PH_SMPBUFFER	pH, SMP Buffer	6.6		Std Units
											ACIDBASE_POT	Acid Base Potential	2.4		t/1000t
											ACIDITY_POT	Acid Potential	ND(4.3)		t/1000t
											NEUT_POT	Neutralization Potential	2.4		t/1000t
											01305-78-8_REC	Recommended Lime	ND(5.4)		t/1000t
											SMPLIME_REQ	SMP Lime Requirement	2.4		t/1000t
CMN-SS-10	CMN-SS-10 (4-5 ft)	BP-CMN-SS-10-04	10163644	10163644002	7/14/2011	Soil	996694.5628	822516.1362	4	5	MOISTURE	Soil Moisture	20.1		%
											SB_T_R	Antimony, Total Recoverable	5.4		mg/kg
											AS_T_R	Arsenic, Total Recoverable	14.1		mg/kg
											BA_T_R	Barium, Total Recoverable	136		mg/kg
											CD_T_R	Cadmium, Total Recoverable	0.32 J	J	mg/kg
											CR_T_R	Chromium, Total Recoverable	4.8 J	J	mg/kg
											CO_T_R	Cobalt, Total Recoverable	12.7 J	J	mg/kg
											CU_T_R	Copper, Total Recoverable	38.1		mg/kg
											FE_T_R	Iron, Total Recoverable	17100		mg/kg
											PB_T_R	Lead, Total Recoverable	24.9		mg/kg
											MN_T_R	Manganese, Total Recoverable	510		mg/kg
											HG_T_R	Mercury, Total Recoverable	0.043 J	J	mg/kg
											NI_T_R	Nickel, Total Recoverable	7.8		mg/kg
											AG_T_R	Silver, Total Recoverable	ND(1.5)		mg/kg
											ZN_T_R	Zinc, Total Recoverable	44.8		mg/kg

APPENDIX B-1. SOLID-MATRIX ANALYTICAL RESULTS
COMBINATION MINE AOC
BLACK PINE MINE

Location	Sample ID	Field Sample ID	Lab Batch ID	Lab Sample ID	Date Sampled	Matrix	X	Y	Sample Start Depth	Sample End Depth	Tri Cas	Analyte[a]	Value	r Qualifier	Units
CMN-SS-11	CMN-SS-11 (0-1 ft)	BP-CMN-SS-11-00	10163644	10163644009	7/14/2011	Soil	995997.1798	822541.4686	0	1	MOISTURE	Soil Moisture	9.2		%
											SULFUR_EX_HCL	Sulfur (HCL Extraction)	ND(0.05)		%
											SULFUR_EX_HNO3	Sulfur (HNO3 Extraction)	ND(0.05)		%
											SULFUR_HOTWATER_HNO3	Sulfur (Hot Water Extraction)	ND(0.05)		%
											SULFUR_RES	Sulfur, Residual	ND(0.05)		%
											SULFUR	Sulfur, Total	ND(0.05)		%
											SB_T_R	Antimony, Total Recoverable	16.2		mg/kg
											AS_T_R	Arsenic, Total Recoverable	22.5		mg/kg
											BA_T_R	Barium, Total Recoverable	130		mg/kg
											CD_T_R	Cadmium, Total Recoverable	1.2 J	J	mg/kg
											CR_T_R	Chromium, Total Recoverable	4.8 J	J	mg/kg
											CO_T_R	Cobalt, Total Recoverable	4.3 J	J	mg/kg
											CU_T_R	Copper, Total Recoverable	64.2		mg/kg
											FE_T_R	Iron, Total Recoverable	8570		mg/kg
											PB_T_R	Lead, Total Recoverable	110		mg/kg
											MN_T_R	Manganese, Total Recoverable	311		mg/kg
											HG_T_R	Mercury, Total Recoverable	0.07 J	J	mg/kg
											NI_T_R	Nickel, Total Recoverable	5.5		mg/kg
											AG_T_R	Silver, Total Recoverable	2.3		mg/kg
											ZN_T_R	Zinc, Total Recoverable	133		mg/kg
											PH_SMPBUFFER	pH, SMP Buffer	7.2		Std Units
											ACIDBASE_POT	Acid Base Potential	1.5		t/1000t
											ACIDITY_POT	Acid Potential	ND(4.3)		t/1000t
											NEUT_POT	Neutralization Potential	1.5		t/1000t
											01305-78-8_REC	Recommended Lime	ND(5.4)		t/1000t
											SMPLIME_REQ	SMP Lime Requirement	0		t/1000t
CMN-SS-11	CMN-SS-11 (4-5 ft)	BP-CMN-SS-11-04	10163644	10163644010	7/14/2011	Soil	995997.1798	822541.4686	4	5	FRAG_COARSE	Coarse Fragments	10.9		%
											OM	Organic Matter	ND(0.1)		%
											MOISTURE	Soil Moisture	9.8		%
											SULFUR_EX_HCL	Sulfur (HCL Extraction)	ND(0.05)		%
											SULFUR_EX_HNO3	Sulfur (HNO3 Extraction)	ND(0.05)		%
											SULFUR_HOTWATER_HNO3	Sulfur (Hot Water Extraction)	ND(0.05)		%
											SULFUR_RES	Sulfur, Residual	ND(0.05)		%
											SULFUR	Sulfur, Total	ND(0.05)		%
											CEC	Cation Exchange Capacity	21.7		meq/100g
											SB_T_R	Antimony, Total Recoverable	4.1		mg/kg
											AS_T_R	Arsenic, Total Recoverable	29.5		mg/kg
											BA_T_R	Barium, Total Recoverable	116		mg/kg
											CD_T_R	Cadmium, Total Recoverable	ND(0.079)	UJ	mg/kg
											CR_T_R	Chromium, Total Recoverable	6.2 J	J	mg/kg
											CO_T_R	Cobalt, Total Recoverable	12.6 J	J	mg/kg
											CU_T_R	Copper, Total Recoverable	18.4		mg/kg
											FE_T_R	Iron, Total Recoverable	27500		mg/kg
											PB_T_R	Lead, Total Recoverable	55.4		mg/kg
											MN_T_R	Manganese, Total Recoverable	610		mg/kg
											HG_T_R	Mercury, Total Recoverable	0.03 J	J	mg/kg
											NI_T_R	Nickel, Total Recoverable	7.2		mg/kg
											N_NO3	Nitrogen, Nitrate	ND(5)		mg/kg
											P_AVAIL	Phosphorous, Available	ND(1)		mg/kg
											K	Potassium, Total	ND(123)		mg/kg
											AG_T_R	Silver, Total Recoverable	0.59		mg/kg
											ZN_T_R	Zinc, Total Recoverable	43.1		mg/kg
											SPCON_SATPASTE	Specific Conductance, Saturated Paste	0.37 J	J	mmhos/cm
											PH_SATPASTE	pH, Saturated Paste	7.2		Std Units
											PH_SMPBUFFER	pH, SMP Buffer	6.9		Std Units
											ACIDBASE_POT	Acid Base Potential	3.2		t/1000t
											ACIDITY_POT	Acid Potential	ND(4.3)		t/1000t
											NEUT_POT	Neutralization Potential	3.2		t/1000t
											01305-78-8_REC	Recommended Lime	ND(5.4)		t/1000t
											SMPLIME_REQ	SMP Lime Requirement	0.3		t/1000t

APPENDIX B-1. SOLID-MATRIX ANALYTICAL RESULTS
COMBINATION MINE AOC
BLACK PINE MINE

Location	Sample ID	Field Sample ID	Lab Batch ID	Lab Sample ID	Date Sampled	Matrix	X	Y	Sample Start Depth	Sample End Depth	Tri Cas	Analyte[a]	Value	r Qualifier	Units
CMN-SS-12	CMN-SS-12 (0-1 ft)	BP-CMN-SS-12-00	10163644	10163644007	7/14/2011	Soil	996196.3849	822453.6733	0	1	MOISTURE	Soil Moisture	20.3		%
											SULFUR_EX_HCL	Sulfur (HCL Extraction)	ND(0.05)		%
											SULFUR_EX_HNO3	Sulfur (HNO3 Extraction)	ND(0.05)		%
											SULFUR_HOTWATER_HNO3	Sulfur (Hot Water Extraction)	ND(0.05)		%
											SULFUR_RES	Sulfur, Residual	ND(0.05)		%
											SULFUR	Sulfur, Total	ND(0.05)		%
											SB_T_R	Antimony, Total Recoverable	9.1		mg/kg
											AS_T_R	Arsenic, Total Recoverable	12.3		mg/kg
											BA_T_R	Barium, Total Recoverable	160		mg/kg
											CD_T_R	Cadmium, Total Recoverable	1.1 J	J	mg/kg
											CR_T_R	Chromium, Total Recoverable	4.3 J	J	mg/kg
											CO_T_R	Cobalt, Total Recoverable	2.5 J	J	mg/kg
											CU_T_R	Copper, Total Recoverable	105		mg/kg
											FE_T_R	Iron, Total Recoverable	6400		mg/kg
											PB_T_R	Lead, Total Recoverable	59		mg/kg
											MN_T_R	Manganese, Total Recoverable	316		mg/kg
											HG_T_R	Mercury, Total Recoverable	0.062 J	J	mg/kg
											NI_T_R	Nickel, Total Recoverable	14.8		mg/kg
											AG_T_R	Silver, Total Recoverable	2		mg/kg
											ZN_T_R	Zinc, Total Recoverable	127		mg/kg
											PH_SMPBUFFER	pH, SMP Buffer	6.8		Std Units
											ACIDBASE_POT	Acid Base Potential	2.2		t/1000t
											ACIDITY_POT	Acid Potential	ND(4.3)		t/1000t
											NEUT_POT	Neutralization Potential	2.2		t/1000t
											01305-78-8_REC	Recommended Lime	ND(5.4)		t/1000t
											SMPLIME_REQ	SMP Lime Requirement	1		t/1000t
CMN-SS-12	CMN-SS-12 (4-5 ft)	BP-CMN-SS-12-04	10163644	10163644008	7/14/2011	Soil	996196.3849	822453.6733	4	5	FRAG_COARSE	Coarse Fragments	11.7		%
											OM	Organic Matter	ND(0.1)		%
											MOISTURE	Soil Moisture	20.2		%
											SULFUR_EX_HCL	Sulfur (HCL Extraction)	ND(0.05)		%
											SULFUR_EX_HNO3	Sulfur (HNO3 Extraction)	ND(0.05)		%
											SULFUR_HOTWATER_HNO3	Sulfur (Hot Water Extraction)	ND(0.05)		%
											SULFUR_RES	Sulfur, Residual	ND(0.05)		%
											SULFUR	Sulfur, Total	ND(0.05)		%
											CEC	Cation Exchange Capacity	23		meq/100g
											SB_T_R	Antimony, Total Recoverable	2.1		mg/kg
											AS_T_R	Arsenic, Total Recoverable	10.4		mg/kg
											BA_T_R	Barium, Total Recoverable	222		mg/kg
											CD_T_R	Cadmium, Total Recoverable	0.19 J	J	mg/kg
											CR_T_R	Chromium, Total Recoverable	8.2 J	J	mg/kg
											CO_T_R	Cobalt, Total Recoverable	7.5 J	J	mg/kg
											CU_T_R	Copper, Total Recoverable	22.3		mg/kg
											FE_T_R	Iron, Total Recoverable	13300		mg/kg
											PB_T_R	Lead, Total Recoverable	23.3		mg/kg
											MN_T_R	Manganese, Total Recoverable	239		mg/kg
											HG_T_R	Mercury, Total Recoverable	0.029 J	J	mg/kg
											NI_T_R	Nickel, Total Recoverable	8.9		mg/kg
											N_NO3	Nitrogen, Nitrate	ND(5)		mg/kg
											P_AVAIL	Phosphorous, Available	ND(1)		mg/kg
											K	Potassium, Total	ND(120)		mg/kg
											AG_T_R	Silver, Total Recoverable	ND(0.5)		mg/kg
											ZN_T_R	Zinc, Total Recoverable	54		mg/kg
											SPCON_SATPASTE	Specific Conductance, Saturated Paste	0.91 J	J	mmhos/cm
											PH_SATPASTE	pH, Saturated Paste	6.8		Std Units
											PH_SMPBUFFER	pH, SMP Buffer	7		Std Units
											ACIDBASE_POT	Acid Base Potential	3.5		t/1000t
											ACIDITY_POT	Acid Potential	ND(4.3)		t/1000t
											NEUT_POT	Neutralization Potential	3.5		t/1000t
											01305-78-8_REC	Recommended Lime	ND(5.4)		t/1000t
											SMPLIME_REQ	SMP Lime Requirement	0		t/1000t

APPENDIX B-1. SOLID-MATRIX ANALYTICAL RESULTS
COMBINATION MINE AOC
BLACK PINE MINE

Location	Sample ID	Field Sample ID	Lab Batch ID	Lab Sample ID	Date Sampled	Matrix	X	Y	Sample Start Depth	Sample End Depth	Tri Cas	Analyte[a]	Value	r Qualifier	Units
CMN-SS-13	CMN-SS-13 (0-1 ft)	BP-CMN-SS-13-00	10163644	10163644005	7/14/2011	Soil	996457.377	822387.2326	0	1	MOISTURE	Soil Moisture	33.9		%
											SULFUR_EX_HCL	Sulfur (HCL Extraction)	ND(0.05)		%
											SULFUR_EX_HNO3	Sulfur (HNO3 Extraction)	ND(0.05)		%
											SULFUR_HOTWATER_HNO3	Sulfur (Hot Water Extraction)	ND(0.05)		%
											SULFUR_RES	Sulfur, Residual	ND(0.05)		%
											SULFUR	Sulfur, Total	0.0751		%
											SB_T_R	Antimony, Total Recoverable	396		mg/kg
											AS_T_R	Arsenic, Total Recoverable	250		mg/kg
											BA_T_R	Barium, Total Recoverable	254		mg/kg
											CD_T_R	Cadmium, Total Recoverable	11.2 J	J	mg/kg
											CR_T_R	Chromium, Total Recoverable	ND(3)	UJ	mg/kg
											CO_T_R	Cobalt, Total Recoverable	4.2 J	J	mg/kg
											CU_T_R	Copper, Total Recoverable	885		mg/kg
											FE_T_R	Iron, Total Recoverable	11700		mg/kg
											PB_T_R	Lead, Total Recoverable	1890		mg/kg
											MN_T_R	Manganese, Total Recoverable	540		mg/kg
											HG_T_R	Mercury, Total Recoverable	1.4 J	J	mg/kg
											NI_T_R	Nickel, Total Recoverable	5.8		mg/kg
											AG_T_R	Silver, Total Recoverable	70.8		mg/kg
											ZN_T_R	Zinc, Total Recoverable	877		mg/kg
											PH_SMPBUFFER	pH, SMP Buffer	5.7		Std Units
											ACIDBASE_POT	Acid Base Potential	1.5		t/1000t
											ACIDITY_POT	Acid Potential	ND(4.3)		t/1000t
											NEUT_POT	Neutralization Potential	1.5		t/1000t
											01305-78-8_REC	Recommended Lime	13		t/1000t
											SMPLIME_REQ	SMP Lime Requirement	8.9		t/1000t
CMN-SS-13	CMN-SS-13 (4-5 ft)	BP-CMN-SS-13-04	10163644	10163644006	7/14/2011	Soil	996457.377	822387.2326	4	5	FRAG_COARSE	Coarse Fragments	33.4		%
											OM	Organic Matter	ND(0.1)		%
											MOISTURE	Soil Moisture	20.2		%
											SULFUR_EX_HCL	Sulfur (HCL Extraction)	ND(0.05)		%
											SULFUR_EX_HNO3	Sulfur (HNO3 Extraction)	ND(0.05)		%
											SULFUR_HOTWATER_HNO3	Sulfur (Hot Water Extraction)	ND(0.05)		%
											SULFUR_RES	Sulfur, Residual	ND(0.05)		%
											SULFUR	Sulfur, Total	ND(0.05)		%
											CEC	Cation Exchange Capacity	24.6		meq/100g
											SB_T_R	Antimony, Total Recoverable	2.4		mg/kg
											AS_T_R	Arsenic, Total Recoverable	8.3		mg/kg
											BA_T_R	Barium, Total Recoverable	173		mg/kg
											CD_T_R	Cadmium, Total Recoverable	ND(0.093)	UJ	mg/kg
											CR_T_R	Chromium, Total Recoverable	9.4 J	J	mg/kg
											CO_T_R	Cobalt, Total Recoverable	4.3 J	J	mg/kg
											CU_T_R	Copper, Total Recoverable	14.5		mg/kg
											FE_T_R	Iron, Total Recoverable	13400		mg/kg
											PB_T_R	Lead, Total Recoverable	24.4		mg/kg
											MN_T_R	Manganese, Total Recoverable	170		mg/kg
											HG_T_R	Mercury, Total Recoverable	0.026 J	J	mg/kg
											NI_T_R	Nickel, Total Recoverable	8		mg/kg
											N_NO3	Nitrogen, Nitrate	ND(5)		mg/kg
											P_AVAIL	Phosphorous, Available	1.4		mg/kg
											K	Potassium, Total	ND(121)		mg/kg
											AG_T_R	Silver, Total Recoverable	0.91		mg/kg
											ZN_T_R	Zinc, Total Recoverable	41.4		mg/kg
											SPCON_SATPASTE	Specific Conductance, Saturated Paste	204 J	J	mmhos/cm
											PH_SATPASTE	pH, Saturated Paste	7.2		Std Units
											PH_SMPBUFFER	pH, SMP Buffer	6.9		Std Units
											ACIDBASE_POT	Acid Base Potential	3.3		t/1000t
											ACIDITY_POT	Acid Potential	ND(4.3)		t/1000t
											NEUT_POT	Neutralization Potential	3.3		t/1000t
											01305-78-8_REC	Recommended Lime	ND(5.4)		t/1000t
											SMPLIME_REQ	SMP Lime Requirement	0.3		t/1000t

APPENDIX B-1. SOLID-MATRIX ANALYTICAL RESULTS
COMBINATION MINE AOC
BLACK PINE MINE

Location	Sample ID	Field Sample ID	Lab Batch ID	Lab Sample ID	Date Sampled	Matrix	X	Y	Sample Start Depth	Sample End Depth	Tri Cas	Analyte[a]	Value	r Qualifier	Units
CMN-SS-14	CMN-SS-14 (0-1 ft)	BP-CMN-SS-14-00	10163644	10163644003	7/14/2011	Soil	997186.0727	822362.1939	0	1	MOISTURE	Soil Moisture	30.4		%
											SULFUR_EX_HCL	Sulfur (HCL Extraction)	ND(0.05)		%
											SULFUR_EX_HNO3	Sulfur (HNO3 Extraction)	ND(0.05)		%
											SULFUR_HOTWATER_HNO3	Sulfur (Hot Water Extraction)	ND(0.05)		%
											SULFUR_RES	Sulfur, Residual	ND(0.05)		%
											SULFUR	Sulfur, Total	ND(0.05)		%
											SB_T_R	Antimony, Total Recoverable	3.1		mg/kg
											AS_T_R	Arsenic, Total Recoverable	19.1		mg/kg
											BA_T_R	Barium, Total Recoverable	177		mg/kg
											CD_T_R	Cadmium, Total Recoverable	2.8 J	J	mg/kg
											CR_T_R	Chromium, Total Recoverable	6.8 J	J	mg/kg
											CO_T_R	Cobalt, Total Recoverable	5.6 J	J	mg/kg
											CU_T_R	Copper, Total Recoverable	321		mg/kg
											FE_T_R	Iron, Total Recoverable	15700		mg/kg
											PB_T_R	Lead, Total Recoverable	19.3		mg/kg
											MN_T_R	Manganese, Total Recoverable	298		mg/kg
											HG_T_R	Mercury, Total Recoverable	0.13 J	J	mg/kg
											NI_T_R	Nickel, Total Recoverable	6.7		mg/kg
											AG_T_R	Silver, Total Recoverable	ND(1.2)		mg/kg
											ZN_T_R	Zinc, Total Recoverable	163		mg/kg
											PH_SMPBUFFER	pH, SMP Buffer	6		Std Units
											ACIDBASE_POT	Acid Base Potential	1.5		t/1000t
											ACIDITY_POT	Acid Potential	ND(4.3)		t/1000t
											NEUT_POT	Neutralization Potential	1.5		t/1000t
											01305-78-8_REC	Recommended Lime	8.3		t/1000t
											SMPLIME_REQ	SMP Lime Requirement	6		t/1000t
CMN-SS-14	CMN-SS-14 (4-5 ft)	BP-CMN-SS-14-04	10163644	10163644004	7/14/2011	Soil	997186.0727	822362.1939	4	5	MOISTURE	Soil Moisture	15.6		%
											SB_T_R	Antimony, Total Recoverable	17.4		mg/kg
											AS_T_R	Arsenic, Total Recoverable	19.9		mg/kg
											BA_T_R	Barium, Total Recoverable	312		mg/kg
											CD_T_R	Cadmium, Total Recoverable	6.9 J	J	mg/kg
											CR_T_R	Chromium, Total Recoverable	4.3 J	J	mg/kg
											CO_T_R	Cobalt, Total Recoverable	5.1 J	J	mg/kg
											CU_T_R	Copper, Total Recoverable	917		mg/kg
											FE_T_R	Iron, Total Recoverable	7080		mg/kg
											PB_T_R	Lead, Total Recoverable	108		mg/kg
											MN_T_R	Manganese, Total Recoverable	602		mg/kg
											HG_T_R	Mercury, Total Recoverable	0.022 J	J	mg/kg
											NI_T_R	Nickel, Total Recoverable	7.3		mg/kg
											AG_T_R	Silver, Total Recoverable	3.7		mg/kg
											ZN_T_R	Zinc, Total Recoverable	279		mg/kg
CMN-SS-15	CMN-SS-15 (0-0.5 ft)	CMN-SS-15	10163635	10163635001	7/13/2011	Soil	996253.9382	823521.0975	0	0.5	MOISTURE	Soil Moisture	21.6		%
											SB_T_R	Antimony, Total Recoverable	6.6		mg/kg
											AS_T_R	Arsenic, Total Recoverable	11.5		mg/kg
											BA_T_R	Barium, Total Recoverable	63.6		mg/kg
											CD_T_R	Cadmium, Total Recoverable	0.6		mg/kg
											CR_T_R	Chromium, Total Recoverable	3.2		mg/kg
											CO_T_R	Cobalt, Total Recoverable	2.5		mg/kg
											CU_T_R	Copper, Total Recoverable	88.5		mg/kg
											FE_T_R	Iron, Total Recoverable	4490		mg/kg
											PB_T_R	Lead, Total Recoverable	62.1		mg/kg
											MN_T_R	Manganese, Total Recoverable	226		mg/kg
											HG_T_R	Mercury, Total Recoverable	0.093 J	J	mg/kg
											NI_T_R	Nickel, Total Recoverable	2.6		mg/kg
											AG_T_R	Silver, Total Recoverable	ND(0.53)		mg/kg
											ZN_T_R	Zinc, Total Recoverable	55.4		mg/kg

APPENDIX B-1. SOLID-MATRIX ANALYTICAL RESULTS
COMBINATION MINE AOC
BLACK PINE MINE

Location	Sample ID	Field Sample ID	Lab Batch ID	Lab Sample ID	Date Sampled	Matrix	X	Y	Sample Start Depth	Sample End Depth	Tri Cas	Analyte[a]	Value	r Qualifier	Units
CMN-SS-16	CMN-SS-16 (0-0.5 ft)	CMN-SS-16	10163635	10163635002	7/13/2011	Soil	996817.0426	824261.1	0	0.5	MOISTURE	Soil Moisture	20.2		%
											SB_T_R	Antimony, Total Recoverable	36.7		mg/kg
											AS_T_R	Arsenic, Total Recoverable	31.7		mg/kg
											BA_T_R	Barium, Total Recoverable	89.9		mg/kg
											CD_T_R	Cadmium, Total Recoverable	2.9		mg/kg
											CR_T_R	Chromium, Total Recoverable	5		mg/kg
											CO_T_R	Cobalt, Total Recoverable	5.4		mg/kg
											CU_T_R	Copper, Total Recoverable	295		mg/kg
											FE_T_R	Iron, Total Recoverable	7450		mg/kg
											PB_T_R	Lead, Total Recoverable	182		mg/kg
											MN_T_R	Manganese, Total Recoverable	556		mg/kg
											HG_T_R	Mercury, Total Recoverable	0.25 J	J	mg/kg
											NI_T_R	Nickel, Total Recoverable	4.9		mg/kg
											AG_T_R	Silver, Total Recoverable	3.2		mg/kg
											ZN_T_R	Zinc, Total Recoverable	148		mg/kg
CMN-SS-17	CMN-SS-17 (0-0.5 ft)	BP-CMN-SS-17	10167132	10167132001	8/18/2011	Soil	995357.433	822766.8568	0	0.5	MOISTURE	Soil Moisture	13.1		%
											SB	Antimony, Total	12.6		mg/kg
											AS	Arsenic, Total	14.5		mg/kg
											BA	Barium, Total	120		mg/kg
											CD	Cadmium, Total	0.86		mg/kg
											CR	Chromium, Total	2.4		mg/kg
											CO_T_R	Cobalt, Total Recoverable	4.2 J	J	mg/kg
											CU	Copper, Total	89.8		mg/kg
											FE	Iron, Total	5160		mg/kg
											PB	Lead, Total	90.4		mg/kg
											MN	Manganese, Total	285		mg/kg
											HG_T_R	Mercury, Total Recoverable	0.041		mg/kg
											NI	Nickel, Total	3.2		mg/kg
											SE	Selenium, Total	ND(0.38)		mg/kg
											AG	Silver, Total	1.6		mg/kg
											ZN	Zinc, Total	79.4		mg/kg
CMN-SS-18	CMN-SS-18 (0-0.5 ft)	BP-CMN-SS-18	10167132	10167132002	8/18/2011	Soil	995338.4658	822701.472	0	0.5	MOISTURE	Soil Moisture	9.4		%
											SB	Antimony, Total	3.6		mg/kg
											AS	Arsenic, Total	9.1		mg/kg
											BA	Barium, Total	70.1		mg/kg
											CD	Cadmium, Total	1.3		mg/kg
											CR	Chromium, Total	1.2		mg/kg
											CO_T_R	Cobalt, Total Recoverable	2.9 J	J	mg/kg
											CU	Copper, Total	62.8		mg/kg
											FE	Iron, Total	6770		mg/kg
											PB	Lead, Total	23		mg/kg
											MN	Manganese, Total	202		mg/kg
											HG_T_R	Mercury, Total Recoverable	0.022		mg/kg
											NI	Nickel, Total	4		mg/kg
											AG	Silver, Total	0.5		mg/kg
											ZN	Zinc, Total	75.5		mg/kg

APPENDIX B-1. SOLID-MATRIX ANALYTICAL RESULTS
COMBINATION MINE AOC
BLACK PINE MINE

Location	Sample ID	Field Sample ID	Lab Batch ID	Lab Sample ID	Date Sampled	Matrix	X	Y	Sample Start Depth	Sample End Depth	Tri Cas	Analyte[a]	Value	r Qualifier	Units
CMN-SS-19	CMN-SS-19 (0-0.5 ft)	BP-CMN-SS-19	10167132	10167132003	8/18/2011	Soil	995327.0854	822769.6997	0	0.5	MOISTURE	Soil Moisture	8.5		%
											SB	Antimony, Total	1010		mg/kg
											AS	Arsenic, Total	537		mg/kg
											BA	Barium, Total	87.7		mg/kg
											CD	Cadmium, Total	67		mg/kg
											CR	Chromium, Total	ND(0.38)		mg/kg
											CO_T_R	Cobalt, Total Recoverable	4.1 J	J	mg/kg
											CU	Copper, Total	56800		mg/kg
											FE	Iron, Total	13600		mg/kg
											PB	Lead, Total	1860		mg/kg
											MN	Manganese, Total	989		mg/kg
											HG_T_R	Mercury, Total Recoverable	1.1		mg/kg
											NI	Nickel, Total	6.8		mg/kg
											AG	Silver, Total	105		mg/kg
											ZN	Zinc, Total	4380		mg/kg

[a] Silver was included in original laboratory analytical reports, but was removed in revised reports by the laboratory

J – Estimated concentration

R - Rejected, data not usable

UJ – Estimated reporting limit

ft - feet

meq/100g - milliequivalents per hundred grams

mg/kg - milligrams per kilogram

mmhos/cm - micromhos per centimeter

% - percent

ND() - Analyte was not detected (reporting limit)

Std Units - Standard Units

t/1000t - tons per thousand tons

APPENDIX B2

SURFACE WATER-MATRIX ANALYTICAL RESULTS, COMBINATION MINE AOC

APPENDIX B-2. SURFACE WATER-MATRIX ANALYTICAL RESULTS
COMBINATION MINE AOC
BLACK PINE MINE

Location	Sample ID	Field Sample ID	Lab Batch ID	Lab Sample ID	Date Sampled	Matrix	X	Y	Tri Cas	Analyte	Value	Reviewer Qualifier	Units
CPS-1	CPS-1	CPS-1	10158290	10158290001	5/19/2011	Water	996465.254	822724.587	FLOW	Flow	24		gpm
									TEMP	Temperature	8.24		oC
									PH	pH	4.15		Std Units
									ACIDITY	Acidity	84,800 J	J	ug/L
									ALKLNTY	Alkalinity	ND(5,000)		ug/L
									AS_T_R	Arsenic, Total Recoverable	ND(0.5)		ug/L
									CD_T_R	Cadmium, Total Recoverable	173		ug/L
									CA	Calcium, Total	65,400		ug/L
									CU_T_R	Copper, Total Recoverable	11,100 J	J	ug/L
									FE_T_R	Iron, Total Recoverable	ND(50)		ug/L
									PB_T_R	Lead, Total Recoverable	0.3		ug/L
									MG	Magnesium, Total	27,300 J	J	ug/L
									MN_T_R	Recoverable	3,680		ug/L
									O2_DIS	Oxygen, Dissolved	16,680		ug/L
									K	Potassium, Total	3,690 J	J	ug/L
									NA	Sodium, Total	6,450 J	J	ug/L
									TDS	Solids, Total Dissolved	584,000		ug/L
									TSS	Solids, Total Suspended	1,200 J	J	ug/L
									SULFATE	Sulfate	294,000		ug/L
									ZN_T_R	Zinc, Total Recoverable	12,600 J	J	ug/L
									F	Conductance Field	573		umhos/cm
CPS-2	CPS-2	CPS-2	10158290	10158290003	5/19/2011	Water	997503.80	822824.78	FLOW	Flow	60		gpm
									TEMP	Temperature	7.47		oC
									PH	pH	5.81		Std Units
									ACIDITY	Acidity	17,900 J	J	ug/L
									ALKLNTY	Alkalinity	16,400		ug/L
									AS_T_R	Arsenic, Total Recoverable	3.5		ug/L
									CD_T_R	Cadmium, Total Recoverable	0.17		ug/L
									CA	Calcium, Total	5,160		ug/L
									CU_T_R	Copper, Total Recoverable	21.2 J	J	ug/L
									FE_T_R	Iron, Total Recoverable	1,580 J	J	ug/L
									PB_T_R	Lead, Total Recoverable	6.6		ug/L
									MG	Magnesium, Total	1,760 J	J	ug/L
									MN_T_R	Recoverable	13.9		ug/L
									O2_DIS	Oxygen, Dissolved	12,500		ug/L
									K	Potassium, Total	1,660 J	J	ug/L
									NA	Sodium, Total	3,000 J	J	ug/L
									TDS	Solids, Total Dissolved	98,000		ug/L
									TSS	Solids, Total Suspended	2,200 J	J	ug/L
									SULFATE	Sulfate	6,100		ug/L
									ZN_T_R	Zinc, Total Recoverable	20.2 J	J	ug/L
									F	Conductance Field	55		umhos/cm

APPENDIX B-2. SURFACE WATER-MATRIX ANALYTICAL RESULTS
COMBINATION MINE AOC
BLACK PINE MINE

Location	Sample ID	Field Sample ID	Lab Batch ID	Lab Sample ID	Date Sampled	Matrix	X	Y	Tri Cas	Analyte	Value	Reviewer Qualifier	Units
CPS-7A	CPS-7A	CPS-7A	10158290	10158290004	5/19/2011	Water	996036.82	822506.99	FLOW	Flow	0.18		gpm
									TEMP	Temperature	14.04		oC
									PH	pH	5.65		Std Units
									ACIDITY	Acidity	37,300 J	J	ug/L
									ALKLNTY	Alkalinity	ND(5,000)		ug/L
									AS_T_R	Arsenic, Total Recoverable	54.7		ug/L
									CD_T_R	Cadmium, Total Recoverable	52.9		ug/L
									CA	Calcium, Total	28,200		ug/L
									CU_T_R	Copper, Total Recoverable	4,320 J	J	ug/L
									FE_T_R	Iron, Total Recoverable	41,400 J	J	ug/L
									PB_T_R	Lead, Total Recoverable	363		ug/L
									MG	Magnesium, Total	16,700 J	J	ug/L
									MN_T_R	Recoverable	938		ug/L
									O2_DIS	Oxygen, Dissolved	10,420		ug/L
									K	Potassium, Total	7,140 J	J	ug/L
									NA	Sodium, Total	3,720 J	J	ug/L
									TDS	Solids, Total Dissolved	320,000		ug/L
									TSS	Solids, Total Suspended	J	J	ug/L
									SULFATE	Sulfate	75,600		ug/L
									ZN_T_R	Zinc, Total Recoverable	4,650 J	J	ug/L
									F	Conductance Field	200		umhos/cm
CPS-8	CPS-8	CPS-8	10158290	10158290005	5/19/2011	Water	995879.43	822216.83	FLOW	Flow	0.066		gpm
									TEMP	Temperature	14		oC
									PH	pH	6.4		Std Units
									ACIDITY	Acidity	23,700 J	J	ug/L
									ALKLNTY	Alkalinity	22,500		ug/L
									AS_T_R	Arsenic, Total Recoverable	3.8		ug/L
									CD_T_R	Cadmium, Total Recoverable	7.8		ug/L
									CA	Calcium, Total	10,300		ug/L
									CU_T_R	Copper, Total Recoverable	339 J	J	ug/L
									SS	Hardness, Total	41,500		ug/L
									FE_T_R	Iron, Total Recoverable	1,950 J	J	ug/L
									PB_T_R	Lead, Total Recoverable	7.7		ug/L
									MG	Magnesium, Total	3,820 J	J	ug/L
									MN_T_R	Recoverable	31.9		ug/L
									O2_DIS	Oxygen, Dissolved	10,640		ug/L
									K	Potassium, Total	1,770 J	J	ug/L
									NA	Sodium, Total	3,900 J	J	ug/L
									TDS	Solids, Total Dissolved	122,000		ug/L
									TSS	Solids, Total Suspended	258,000 J	J	ug/L
									SULFATE	Sulfate	19,600		ug/L
									ZN_T_R	Zinc, Total Recoverable	361 J	J	ug/L
									F	Conductance Field	49		umhos/cm

APPENDIX B-2. SURFACE WATER-MATRIX ANALYTICAL RESULTS
COMBINATION MINE AOC
BLACK PINE MINE

Location	Sample ID	Field Sample ID	Lab Batch ID	Lab Sample ID	Date Sampled	Matrix	X	Y	Tri Cas	Analyte	Value	Reviewer Qualifier	Units
CPS-10B	CPS-10	CPS-10	10158290	10158290011	5/19/2011	Water	996249.08	822739.37	FLOW	Flow	0.5		gpm
					5/16/2011				TEMP	Temperature	8.51		oC
									PH	pH	4.51		Std Units
									O2_DIS	Oxygen, Dissolved	14,700		ug/L
									F	Conductance Field	528		umhos/cm
	CPS-10B	CPS-10B			5/19/2011				ACIDITY	Acidity	40,200 J	J	ug/L
									ALKLNTY	Alkalinity	ND(5,000)		ug/L
									AS_T_R	Arsenic, Total Recoverable	4.5		ug/L
									CD_T_R	Cadmium, Total Recoverable	132		ug/L
									CA	Calcium, Total	58,600		ug/L
									CU_T_R	Copper, Total Recoverable	8,600 J	J	ug/L
									FE_T_R	Iron, Total Recoverable	4,700 J	J	ug/L
									PB_T_R	Lead, Total Recoverable	9.2		ug/L
									MG	Magnesium, Total	24,300 J	J	ug/L
									MN_T_R	Recoverable	2,590		ug/L
									K	Potassium, Total	4,630 J	J	ug/L
									NA	Sodium, Total	6,680 J	J	ug/L
									TDS	Solids, Total Dissolved	462,000		ug/L
									TSS	Solids, Total Suspended	644,000 J	J	ug/L
									SULFATE	Sulfate	266,000		ug/L
									ZN_T_R	Zinc, Total Recoverable	9,720 J	J	ug/L
CPSW-1	CPSW-1	CPSW-1	10158290	10158290006	5/19/2011	Water	998058.96	822260.26	FLOW	Flow	70		gpm
									TEMP	Temperature	13.67		oC
									PH	pH	6.57		Std Units
									ACIDITY	Acidity	26,600 J	J	ug/L
									ALKLNTY	Alkalinity	12,800		ug/L
									AS_T_R	Arsenic, Total Recoverable	3.1		ug/L
									CD_T_R	Cadmium, Total Recoverable	2.2		ug/L
									CA	Calcium, Total	6,200		ug/L
									CU_T_R	Copper, Total Recoverable	89.9 J	J	ug/L
									FE_T_R	Iron, Total Recoverable	1,380 J	J	ug/L
									PB_T_R	Lead, Total Recoverable	4.6		ug/L
									MG	Magnesium, Total	2,130 J	J	ug/L
									MN_T_R	Recoverable	26.7		ug/L
									O2_DIS	Oxygen, Dissolved	9,710		ug/L
									K	Potassium, Total	1,920 J	J	ug/L
									NA	Sodium, Total	3,200 J	J	ug/L
									TDS	Solids, Total Dissolved	104,000		ug/L
									TSS	Solids, Total Suspended	5,000 J	J	ug/L
									SULFATE	Sulfate	14,800		ug/L
									ZN_T_R	Zinc, Total Recoverable	184 J	J	ug/L
									F	Conductance Field	68		umhos/cm

APPENDIX B-2. SURFACE WATER-MATRIX ANALYTICAL RESULTS
COMBINATION MINE AOC
BLACK PINE MINE

Location	Sample ID	Field Sample ID	Lab Batch ID	Lab Sample ID	Date Sampled	Matrix	X	Y	Tri Cas	Analyte	Value	Reviewer Qualifier	Units
CPSW-2	CPSW-2	CPSW-2	10158290	10158290007	5/19/2011	Water	999451.31	822083.45	FLOW	Flow	105		gpm
									TEMP	Temperature	17.14		oC
									PH	pH	6.1		Std Units
									ACIDITY	Acidity	36,300 J	J	ug/L
									ALKLNTY	Alkalinity	10,200		ug/L
									AS_T_R	Arsenic, Total Recoverable	2.3		ug/L
									CD_T_R	Cadmium, Total Recoverable	2.3		ug/L
									CA	Calcium, Total	6,960		ug/L
									CU_T_R	Copper, Total Recoverable	126 J	J	ug/L
									FE_T_R	Iron, Total Recoverable	777 J	J	ug/L
									PB_T_R	Lead, Total Recoverable	3.1		ug/L
									MG	Magnesium, Total	2,320 J	J	ug/L
									MN_T_R	Recoverable	19.3		ug/L
									O2_DIS	Oxygen, Dissolved	9,040		ug/L
									K	Potassium, Total	2,030 J	J	ug/L
									NA	Sodium, Total	3,280 J	J	ug/L
									TDS	Solids, Total Dissolved	116,000		ug/L
					5/16/2011				TSS	Solids, Total Suspended	4,500 J	J	ug/L
									SULFATE	Sulfate	21,900		ug/L
									ZN_T_R	Zinc, Total Recoverable	199 J	J	ug/L
									F	Conductance Field	90		umhos/cm
DTRD	DTRD	CPS-10A	10158290	10158290002	5/19/2011	Water			FLOW	Flow	1.5		gpm
									TEMP	Temperature	8.54?0		oC
									PH	pH	3.42?0		Std Units
									ACIDITY	Acidity	75,700 J	J	ug/L
									ALKLNTY	Alkalinity	ND(5,000)		ug/L
									AS_T_R	Arsenic, Total Recoverable	2.9		ug/L
									CD_T_R	Cadmium, Total Recoverable	215		ug/L
									CA	Calcium, Total	20,000		ug/L
									CU_T_R	Copper, Total Recoverable	20,900 J	J	ug/L
									FE_T_R	Iron, Total Recoverable	1,140 J	J	ug/L
									PB_T_R	Lead, Total Recoverable	34.3		ug/L
									MG	Magnesium, Total	9,020 J	J	ug/L
									MN_T_R	Recoverable	6,640		ug/L
									O2_DIS	Oxygen, Dissolved	11,050		ug/L
									K	Potassium, Total	2,100 J	J	ug/L
									NA	Sodium, Total	4,180 J	J	ug/L
									TDS	Solids, Total Dissolved	284,000		ug/L
									TSS	Solids, Total Suspended	76,800 J	J	ug/L
									SULFATE	Sulfate	169,000		ug/L
									ZN_T_R	Zinc, Total Recoverable	20,400 J	J	ug/L
									F	Conductance Field	415?0		umhos/cm

APPENDIX B-2. SURFACE WATER-MATRIX ANALYTICAL RESULTS
COMBINATION MINE AOC
BLACK PINE MINE

Location	Sample ID	Field Sample ID	Lab Batch ID	Lab Sample ID	Date Sampled	Matrix	X	Y	Tri Cas	Analyte	Value	Reviewer Qualifier	Units
North Area Spring (N)	North Area Spring (N)	CPS-11	10158290	10158290012	5/19/2011	Water			FLOW	Flow	3		gpm
									TEMP	Temperature	7.79		oC
									PH	pH	5.35		Std Units
									ACIDITY	Acidity	34,400 J	J	ug/L
									ALKLNTY	Alkalinity	12,900		ug/L
									AS_T_R	Arsenic, Total Recoverable	1.7		ug/L
									CD_T_R	Cadmium, Total Recoverable	13.4		ug/L
									CA	Calcium, Total	13,300		ug/L
									CU_T_R	Copper, Total Recoverable	638 J	J	ug/L
									FE_T_R	Iron, Total Recoverable	1,340 J	J	ug/L
									PB_T_R	Lead, Total Recoverable	2.8		ug/L
									MG	Magnesium, Total	5,120 J	J	ug/L
									MN_T_R	Recoverable	113		ug/L
									O2_DIS	Oxygen, Dissolved	14,300		ug/L
									K	Potassium, Total	1,930 J	J	ug/L
									NA	Sodium, Total	3,260 J	J	ug/L
		North Area Spring (N)							TDS	Solids, Total Dissolved	144,000		ug/L
									TSS	Solids, Total Suspended	21,000 J	J	ug/L
									SULFATE	Sulfate	28,500 J	J	ug/L
									ZN_T_R	Zinc, Total Recoverable	1,010 J	J	ug/L
									F	Conductance Field	145		umhos/cm
North Runoff	North Runoff	NORTH RUNOFF	10158290	10158290008	5/19/2011	Water	996449.23	822751.72	FLOW	Flow	15		gpm
									TEMP	Temperature	12.09		oC
									PH	pH	6.18		Std Units
									ACIDITY	Acidity	36,300 J	J	ug/L
									ALKLNTY	Alkalinity	10,500		ug/L
									AS_T_R	Arsenic, Total Recoverable	2.1		ug/L
									CD_T_R	Cadmium, Total Recoverable	17.9		ug/L
									CA	Calcium, Total	16,600		ug/L
									CU_T_R	Copper, Total Recoverable	666 J	J	ug/L
									FE_T_R	Iron, Total Recoverable	1,460 J	J	ug/L
									PB_T_R	Lead, Total Recoverable	3.2		ug/L
									MG	Magnesium, Total	6,460 J	J	ug/L
									MN_T_R	Recoverable	152		ug/L
									O2_DIS	Oxygen, Dissolved	10,420		ug/L
									K	Potassium, Total	2,210 J	J	ug/L
									NA	Sodium, Total	3,800 J	J	ug/L
									TDS	Solids, Total Dissolved	161,000		ug/L
									TSS	Solids, Total Suspended	26,900 J	J	ug/L
									SULFATE	Sulfate	60,500		ug/L
									ZN_T_R	Zinc, Total Recoverable	1,310 J	J	ug/L
									F	Conductance Field	171		umhos/cm

J – Estimated concentration
oC - degrees Celsius
gpm - gallons per minute
ug/L - micrograms per liter
umhos/cm - micro hmos per centimeter
Std Units - Standard units
ND() - Analyte was not detected (reporting limit)

APPENDIX B3

GROUNDWATER ANALYTICAL RESULTS, COMBINATION MINE AOC

APPENDIX B-3. GROUNDWATER ANALYTICAL RESULTS
COMBINATION MINE AOC
BLACK PINE MINE

Location	Sample ID	Field Sample ID	Lab Batch ID	Lab Sample ID	Date Sampled	X	Y	Tri Cas	Analyte	Value	Reviewer	Units
CMMW-1	CMMW-1	CMMW-1	10156716	10156716001	5/5/2011	995873.6412	822600.3388	ALKLNTY	Alkalinity	42,600		ug/L
								DAS	Arsenic, Dissolved	1.6		ug/L
								DCD	Cadmium, Dissolved	0.13		ug/L
								DCA	Calcium, Dissolved	7,040		ug/L
								DCU	Copper, Dissolved	1.3 J	J	ug/L
								DFE	Iron, Dissolved	550 J	J	ug/L
								DPB	Lead, Dissolved	0.9 J	J	ug/L
								DMG	Magnesium, Dissolved	3,960		ug/L
								DMN	Manganese, Dissolved	7.1 J	J	ug/L
								DK	Potassium, Dissolved	1,270 J	J	ug/L
								DNA	Sodium, Dissolved	8,380		ug/L
								TDS	Solids, Total Dissolved	86,000 J	J	ug/L
								TSS	Solids, Total Suspended	1,930,000 J	J	ug/L
								SULFATE	Sulfate	2,300		ug/L
								DZN	Zinc, Dissolved	6.1		ug/L
								TEMP	Temperature	5.1		oC
								PH	pH	5.7		Std Units
								O2_DIS	Oxygen, Dissolved	8,600		ug/L
								SPCON_F	Conductance Field	120		umhos/cm
CMMW-2	CMMW-2	CMMW-2	10156716	10156716002	5/5/2011	995414.7286	822839.4646	ALKLNTY	Alkalinity	176,000		ug/L
								DAS	Arsenic, Dissolved	108		ug/L
								DCD	Cadmium, Dissolved	14.5		ug/L
								DCA	Calcium, Dissolved	277,000		ug/L
								DCU	Copper, Dissolved	239		ug/L
								DFE	Iron, Dissolved	121 J	J	ug/L
								DPB	Lead, Dissolved	8.6 J	J	ug/L
								DMG	Magnesium, Dissolved	56,500		ug/L
								DMN	Manganese, Dissolved	103		ug/L
								DK	Potassium, Dissolved	17,200		ug/L
								DNA	Sodium, Dissolved	106,000		ug/L
								TDS	Solids, Total Dissolved	1,600,000		ug/L
								TSS	Solids, Total Suspended	89,900		ug/L
								SULFATE	Sulfate	927,000		ug/L
								DZN	Zinc, Dissolved	1,410		ug/L
								TEMP	Temperature	5.7		oC
								PH	pH	5.8		Std Units
								O2_DIS	Oxygen, Dissolved	8,500		ug/L
								SPCON_F	Conductance Field	200		umhos/cm

APPENDIX B-3. GROUNDWATER ANALYTICAL RESULTS
COMBINATION MINE AOC
BLACK PINE MINE

Location	Sample ID	Field Sample ID	Lab Batch ID	Lab Sample ID	Date Sampled	X	Y	Tri Cas	Analyte	Value	Reviewer	Units
CMMW-3	CMMW-3	CMMW-3	10156716	10156716003	5/5/2011	996105.0482	822910.5532	ALKLNTY	Alkalinity	ND(5,000)		ug/L
								DAS	Arsenic, Dissolved	ND(0.5)		ug/L
								DCD	Cadmium, Dissolved	170		ug/L
								DCA	Calcium, Dissolved	57,200		ug/L
								DCU	Copper, Dissolved	12,100		ug/L
								DFE	Iron, Dissolved	ND(50)	UJ	ug/L
								DPB	Lead, Dissolved	0.31 J	J	ug/L
								DMG	Magnesium, Dissolved	23,400		ug/L
								DMN	Manganese, Dissolved	4,280		ug/L
								DK	Potassium, Dissolved	4,250		ug/L
								DNA	Sodium, Dissolved	6,430		ug/L
								TDS	Solids, Total Dissolved	516,000		ug/L
								TSS	Solids, Total Suspended	358,000		ug/L
								SULFATE	Sulfate	282,000		ug/L
								DZN	Zinc, Dissolved	12,200		ug/L
								TEMP	Temperature	7.2		oC
								PH	pH	5.1		Std Units
								O2_DIS	Oxygen, Dissolved	11,800		ug/L
								SPCON_F	Conductance Field	690		umhos/cm
CMMW-4	CMMW-4	CMMW-4	10156716	10156716004	5/5/2011	996275.8875	822695.3889	ALKLNTY	Alkalinity	ND(5,000)		ug/L
								DAS	Arsenic, Dissolved	ND(0.5)		ug/L
								DCD	Cadmium, Dissolved	51.9		ug/L
								DCA	Calcium, Dissolved	39,700		ug/L
								DCU	Copper, Dissolved	3,120		ug/L
								DFE	Iron, Dissolved	ND(50)	UJ	ug/L
								DPB	Lead, Dissolved	0.12 J	J	ug/L
								DMG	Magnesium, Dissolved	14,500		ug/L
								DMN	Manganese, Dissolved	884		ug/L
								DK	Potassium, Dissolved	2,340		ug/L
								DNA	Sodium, Dissolved	7,000		ug/L
								TDS	Solids, Total Dissolved	294,000		ug/L
								TSS	Solids, Total Suspended	21,900		ug/L
								SULFATE	Sulfate	174,000		ug/L
								DZN	Zinc, Dissolved	3,940		ug/L
								TEMP	Temperature	5.3		oC
								PH	pH	4.9		Std Units
								O2_DIS	Oxygen, Dissolved	11,800		ug/L
								SPCON_F	Conductance Field	430		umhos/cm

APPENDIX B-3. GROUNDWATER ANALYTICAL RESULTS
COMBINATION MINE AOC
BLACK PINE MINE

Location	Sample ID	Field Sample ID	Lab Batch ID	Lab Sample ID	Date Sampled	X	Y	Tri Cas	Analyte	Value	Reviewer	Units
CMMW-5	CMMW-5	CMMW-5	10156716	10156716005	5/5/2011	995478.4408	822901.3368	ALKLNTY	Alkalinity	ND(5,000)		ug/L
								DAS	Arsenic, Dissolved	3		ug/L
								DCD	Cadmium, Dissolved	152		ug/L
								DCA	Calcium, Dissolved	23,500		ug/L
								DCU	Copper, Dissolved	7,100		ug/L
								DFE	Iron, Dissolved	988 J	J	ug/L
								DPB	Lead, Dissolved	23.2 J	J	ug/L
								DMG	Magnesium, Dissolved	8,100		ug/L
								DMN	Manganese, Dissolved	4,040		ug/L
								DK	Potassium, Dissolved	3,400		ug/L
								DNA	Sodium, Dissolved	2,670		ug/L
								TDS	Solids, Total Dissolved	268,000		ug/L
								TSS	Solids, Total Suspended	782,000		ug/L
								SULFATE	Sulfate	113,000		ug/L
								DZN	Zinc, Dissolved	10,700		ug/L
								TEMP	Temperature	6.6		oC
								PH	pH	5.2		Std Units
								O2_DIS	Oxygen, Dissolved	8,600		ug/L
								SPCON_F	Conductance Field	230		umhos/cm
CMMW-6	CMMW-6	CMMW-6	10156716	10156716006	5/5/2011	995415.6679	823222.6316	ALKLNTY	Alkalinity	39,000		ug/L
								DAS	Arsenic, Dissolved	1.9		ug/L
								DCD	Cadmium, Dissolved	0.53		ug/L
								DCA	Calcium, Dissolved	11,600		ug/L
								DCU	Copper, Dissolved	19.4		ug/L
								DFE	Iron, Dissolved	661 J	J	ug/L
								DPB	Lead, Dissolved	4.1 J	J	ug/L
								DMG	Magnesium, Dissolved	4,920		ug/L
								DMN	Manganese, Dissolved	19.9		ug/L
								DK	Potassium, Dissolved	2,220		ug/L
								DNA	Sodium, Dissolved	3,270		ug/L
								TDS	Solids, Total Dissolved	150,000		ug/L
								TSS	Solids, Total Suspended	311,000		ug/L
								SULFATE	Sulfate	11,900		ug/L
								DZN	Zinc, Dissolved	33.3		ug/L
								TEMP	Temperature	5.9		oC
								PH	pH	5.4		Std Units
								O2_DIS	Oxygen, Dissolved	11,600		ug/L
								SPCON_F	Conductance Field	130		umhos/cm

APPENDIX B-3. GROUNDWATER ANALYTICAL RESULTS
COMBINATION MINE AOC
BLACK PINE MINE

Location	Sample ID	Field Sample ID	Lab Batch ID	Lab Sample ID	Date Sampled	X	Y	Tri Cas	Analyte	Value	Reviewer	Units
CMMW-7	CMMW-7	CMMW-7	10156716	10156716007	5/5/2011	995985.2132	822968.8146	ALKLNTY	Alkalinity	13,000		ug/L
								DAS	Arsenic, Dissolved	2.2		ug/L
								DCD	Cadmium, Dissolved	305		ug/L
								DCA	Calcium, Dissolved	95,600		ug/L
								DCU	Copper, Dissolved	22,200		ug/L
								DFE	Iron, Dissolved	2,050 J	J	ug/L
								DPB	Lead, Dissolved	2.6 J	J	ug/L
								DMG	Magnesium, Dissolved	38,800		ug/L
								DMN	Manganese, Dissolved	7,740		ug/L
								DK	Potassium, Dissolved	5,650		ug/L
								DNA	Sodium, Dissolved	7,320		ug/L
								TDS	Solids, Total Dissolved	802,000		ug/L
								TSS	Solids, Total Suspended	4,170,000		ug/L
								SULFATE	Sulfate	480,000		ug/L
								DZN	Zinc, Dissolved	22,300		ug/L
								TEMP	Temperature	7.6		oC
								PH	pH	4.4		Std Units
								O2_DIS	Oxygen, Dissolved	11,500		ug/L
								SPCON_F	Conductance Field	100		umhos/cm
CMMW-8	CMMW-8	CMMW-8	10156716	10156716008	5/5/2011	995905.6926	822780.2681	ALKLNTY	Alkalinity	18,600		ug/L
								DAS	Arsenic, Dissolved	0.57		ug/L
								DCD	Cadmium, Dissolved	155		ug/L
								DCA	Calcium, Dissolved	145,000		ug/L
								DCU	Copper, Dissolved	8,420		ug/L
								DFE	Iron, Dissolved	281 J	J	ug/L
								DPB	Lead, Dissolved	0.48 J	J	ug/L
								DMG	Magnesium, Dissolved	63,800		ug/L
								DMN	Manganese, Dissolved	4,550		ug/L
								DK	Potassium, Dissolved	5,520		ug/L
								DNA	Sodium, Dissolved	32,900		ug/L
								TDS	Solids, Total Dissolved	1,020,000		ug/L
								TSS	Solids, Total Suspended	350,000		ug/L
								SULFATE	Sulfate	656,000		ug/L
								DZN	Zinc, Dissolved	12,300		ug/L
								TEMP	Temperature	7		oC
								PH	pH	5.4		Std Units
								O2_DIS	Oxygen, Dissolved	10,900		ug/L
								SPCON_F	Conductance Field	130		umhos/cm

APPENDIX B-3. GROUNDWATER ANALYTICAL RESULTS
COMBINATION MINE AOC
BLACK PINE MINE

Location	Sample ID	Field Sample ID	Lab Batch ID	Lab Sample ID	Date Sampled	X	Y	Tri Cas	Analyte	Value	Reviewer	Units
CMMW-9	CMMW-9	CMMW-9	10156716	10156716009	5/5/2011	995908.6085	822785.0912	ALKLNTY	Alkalinity	23,400		ug/L
								DAS	Arsenic, Dissolved	0.72		ug/L
								DCD	Cadmium, Dissolved	6.9		ug/L
								DCA	Calcium, Dissolved	87,200		ug/L
								DCU	Copper, Dissolved	24.1		ug/L
								DFE	Iron, Dissolved	197 J	J	ug/L
								DPB	Lead, Dissolved	0.38 J	J	ug/L
								DMG	Magnesium, Dissolved	26,800		ug/L
								DMN	Manganese, Dissolved	86.4		ug/L
								DK	Potassium, Dissolved	4,910		ug/L
								DNA	Sodium, Dissolved	29,400		ug/L
								TDS	Solids, Total Dissolved	616,000		ug/L
								TSS	Solids, Total Suspended	1,330,000		ug/L
								SULFATE	Sulfate	299,000		ug/L
								DZN	Zinc, Dissolved	709		ug/L
								TEMP	Temperature	7		oC
								PH	pH	5.4		Std Units
								O2_DIS	Oxygen, Dissolved	12,100		ug/L
								SPCON_F	Conductance Field	790		umhos/cm

J – Estimated concentration
UJ – Estimated reporting limit
oC - degrees Celsius
gpm - gallons per minute
ug/L - micrograms per liter
umhos/cm - micro mhos per centimeter
Std Units - Standard units
ND() - Analyte was not detected (reporting limit)

APPENDIX B4

SOLID-MATRIX ANALYTICAL RESULTS, TIM SMITH MINE AOC

APPENDIX B-4. SOLID-MATRIX ANALYTICAL RESULTS
TIM SMITH MINE AOC
BLACK PINE MINE

Location	Sample ID	Field Sample ID	Lab Batch ID	Lab Sample ID	Date Sampled	Matrix	X	Y	Sample Start Depth	Sample End Depth	Tri Cas	Analyte[a]	Value	Reviewer	Units
TS-RS-01	TS-RS-01 (4-6 ft)	BP-TS-RS-01-04	10163483	10163483001	7/12/2011	Soil	991334.57	824297.71	4	6	MOISTURE	Soil Moisture	5.2		%
											SULFUR_EX_HCL	Sulfur (HCL Extraction)	ND(0.05)		%
											SULFUR_EX_HNO3	Sulfur (HNO3 Extraction)	0.0546		%
											SULFUR_HOTWATER_HNO3	Sulfur (Hot Water Extraction)	0.0639		%
											SULFUR_RES	Sulfur, Residual	ND(0.05)		%
											SULFUR	Sulfur, Total	0.141		%
											SB_T_R	Antimony, Total Recoverable	508		mg/kg
											AS_T_R	Arsenic, Total Recoverable	629		mg/kg
											BA_T_R	Barium, Total Recoverable	241		mg/kg
											CD_T_R	Cadmium, Total Recoverable	3.9		mg/kg
											CR_T_R	Chromium, Total Recoverable	1.8		mg/kg
											CO_T_R	Cobalt, Total Recoverable	0.94 J	J	mg/kg
											CU_T_R	Copper, Total Recoverable	1510		mg/kg
											FE_T_R	Iron, Total Recoverable	26500		mg/kg
											PB_T_R	Lead, Total Recoverable	1880		mg/kg
											MN_T_R	Manganese, Total Recoverable	248		mg/kg
											HG_T_R	Mercury, Total Recoverable	2.3 J	J	mg/kg
											NI_T_R	Nickel, Total Recoverable	ND(2.2)		mg/kg
											AG_T_R	Silver, Total Recoverable	63.7		mg/kg
											ZN_T_R	Zinc, Total Recoverable	149		mg/kg
											PH_SMPBUFFER	pH, SMP Buffer	7.1		Std Units
											ACIDBASE_POT	Acid Base Potential	0		t/1000t
											ACIDITY_POT	Acid Potential	ND(4.3)		t/1000t
											NEUT_POT	Neutralization Potential	ND(0.5)		t/1000t
											01305-78-8_REC	Recommended Lime	ND(5.4)		t/1000t
											SMPLIME_REQ	SMP Lime Requirement	0		t/1000t
TS-RS-03	TS-RS-03 (2-4 ft)	BP-TS-RS-03-02	10163483	10163483004	7/12/2011	Soil	991327.96	824180.93	2	4	MOISTURE	Soil Moisture	3.6		%
											SULFUR_EX_HCL	Sulfur (HCL Extraction)	ND(0.05)		%
											SULFUR_EX_HNO3	Sulfur (HNO3 Extraction)	0.0625		%
											SULFUR_HOTWATER_HNO3	Sulfur (Hot Water Extraction)	0.0695		%
											SULFUR_RES	Sulfur, Residual	ND(0.05)		%
											SULFUR	Sulfur, Total	0.161		%
											SB_T_R	Antimony, Total Recoverable	712		mg/kg
											AS_T_R	Arsenic, Total Recoverable	868		mg/kg
											BA_T_R	Barium, Total Recoverable	186		mg/kg
											CD_T_R	Cadmium, Total Recoverable	6		mg/kg
											CR_T_R	Chromium, Total Recoverable	1.7		mg/kg
											CO_T_R	Cobalt, Total Recoverable	1.3 J	J	mg/kg
											CU_T_R	Copper, Total Recoverable	794		mg/kg
											FE_T_R	Iron, Total Recoverable	28100		mg/kg
											PB_T_R	Lead, Total Recoverable	3060		mg/kg
											MN_T_R	Manganese, Total Recoverable	125		mg/kg
											HG_T_R	Mercury, Total Recoverable	2.1 J	J	mg/kg
											NI_T_R	Nickel, Total Recoverable	2.7		mg/kg
											AG_T_R	Silver, Total Recoverable	201		mg/kg
											ZN_T_R	Zinc, Total Recoverable	144		mg/kg
											PH_SMPBUFFER	pH, SMP Buffer	6.8		Std Units
											ACIDBASE_POT	Acid Base Potential	0		t/1000t
											ACIDITY_POT	Acid Potential	ND(4.3)		t/1000t
											NEUT_POT	Neutralization Potential	ND(0.5)		t/1000t
											01305-78-8_REC	Recommended Lime	ND(5.4)		t/1000t
											SMPLIME_REQ	SMP Lime Requirement	1		t/1000t

APPENDIX B-4. SOLID-MATRIX ANALYTICAL RESULTS
TIM SMITH MINE AOC
BLACK PINE MINE

Location	Sample ID	Field Sample ID	Lab Batch ID	Lab Sample ID	Date Sampled	Matrix	X	Y	Sample Start Depth	Sample End Depth	Tri Cas	Analyte[a]	Value	Reviewer	Units
TS-RS-07	TS-RS-07 (4-6 ft)	BP-TS-RS-07-04	10163483	10163483007	7/13/2011	Soil	992112.32	826172.09	4	6	MOISTURE	Soil Moisture	9.8		%
											SULFUR_EX_HCL	Sulfur (HCL Extraction)	ND(0.05)		%
											SULFUR_EX_HNO3	Sulfur (HNO3 Extraction)	ND(0.05)		%
											SULFUR_HOTWATER_HNO3	Sulfur (Hot Water Extraction)	ND(0.05)		%
											SULFUR_RES	Sulfur, Residual	ND(0.05)		%
											SULFUR	Sulfur, Total	0.092		%
											SB_T_R	Antimony, Total Recoverable	219		mg/kg
											AS_T_R	Arsenic, Total Recoverable	118		mg/kg
											BA_T_R	Barium, Total Recoverable	49.3		mg/kg
											CD_T_R	Cadmium, Total Recoverable	0.12		mg/kg
											CR_T_R	Chromium, Total Recoverable	5.4		mg/kg
											CO_T_R	Cobalt, Total Recoverable	2.5 J	J	mg/kg
											CU_T_R	Copper, Total Recoverable	31.3		mg/kg
											FE_T_R	Iron, Total Recoverable	17000		mg/kg
											PB_T_R	Lead, Total Recoverable	162		mg/kg
											MN_T_R	Manganese, Total Recoverable	67.6		mg/kg
											HG_T_R	Mercury, Total Recoverable	1.1 J	J	mg/kg
											NI_T_R	Nickel, Total Recoverable	4.9		mg/kg
											AG_T_R	Silver, Total Recoverable	13.5		mg/kg
											ZN_T_R	Zinc, Total Recoverable	18.6		mg/kg
											PH_SMPBUFFER	pH, SMP Buffer	7.3		Std Units
											ACIDBASE_POT	Acid Base Potential	0.7		t/1000t
											ACIDITY_POT	Acid Potential	ND(4.3)		t/1000t
											NEUT_POT	Neutralization Potential	0.72		t/1000t
											01305-78-8_REC	Recommended Lime	ND(5.4)		t/1000t
											SMPLIME_REQ	SMP Lime Requirement	0		t/1000t
TS-SD-01	TS-SD-01 (0-0.5 ft)	BP-TS-SD-01-00	10160707	10160707002	6/13/2011	Sediment	990839.04	824292.65	0	0.5	MOISTURE	Soil Moisture	65.9		%
											SB_T_R	Antimony, Total Recoverable	37.2		mg/kg
											AS_T_R	Arsenic, Total Recoverable	31.1		mg/kg
											BA_T_R	Barium, Total Recoverable	266		mg/kg
											CD_T_R	Cadmium, Total Recoverable	9.1 J	J	mg/kg
											CR_T_R	Chromium, Total Recoverable	10.7		mg/kg
											CO_T_R	Cobalt, Total Recoverable	6.5 J	J	mg/kg
											CU_T_R	Copper, Total Recoverable	639		mg/kg
											FE_T_R	Iron, Total Recoverable	10100		mg/kg
											PB_T_R	Lead, Total Recoverable	110		mg/kg
											MN_T_R	Manganese, Total Recoverable	1140		mg/kg
											HG_T_R	Mercury, Total Recoverable	0.23		mg/kg
											NI_T_R	Nickel, Total Recoverable	24.5		mg/kg
											AG_T_R	Silver, Total Recoverable	6.1 J	J	mg/kg
											ZN_T_R	Zinc, Total Recoverable	236		mg/kg
TS-SD-02	TS-SD-02 (0-0.5 ft)	BP-TS-SD-02-00	10160707	10160707006	6/13/2011	Sediment	989432.59	823797.61	0	0.5	MOISTURE	Soil Moisture	68.9		%
											SB_T_R	Antimony, Total Recoverable	3.2		mg/kg
											AS_T_R	Arsenic, Total Recoverable	22.4		mg/kg
											BA_T_R	Barium, Total Recoverable	635		mg/kg
											CD_T_R	Cadmium, Total Recoverable	1.1 J	J	mg/kg
											CR_T_R	Chromium, Total Recoverable	16		mg/kg
											CO_T_R	Cobalt, Total Recoverable	11.6 J	J	mg/kg
											CU_T_R	Copper, Total Recoverable	50.9		mg/kg
											FE_T_R	Iron, Total Recoverable	24700		mg/kg
											PB_T_R	Lead, Total Recoverable	65.2		mg/kg
											MN_T_R	Manganese, Total Recoverable	947		mg/kg
											HG_T_R	Mercury, Total Recoverable	24.4		mg/kg
											NI_T_R	Nickel, Total Recoverable	20		mg/kg
											AG_T_R	Silver, Total Recoverable	ND(1.5)	UJ	mg/kg
											ZN_T_R	Zinc, Total Recoverable	117		mg/kg

APPENDIX B-4. SOLID-MATRIX ANALYTICAL RESULTS
TIM SMITH MINE AOC
BLACK PINE MINE

Location	Sample ID	Field Sample ID	Lab Batch ID	Lab Sample ID	Date Sampled	Matrix	X	Y	Sample Start Depth	Sample End Depth	Tri Cas	Analyte[a]	Value	Reviewer	Units
TS-SD-03	TS-SD-03 (0-0.5 ft)	BP-CML-SD-03-00	10160673	10160673003	6/14/2011	Sediment	987859.71	825256.19	0	0.5	MOISTURE	Soil Moisture	71.6		%
											SB_T_R	Antimony, Total Recoverable	3.3		mg/kg
											AS_T_R	Arsenic, Total Recoverable	20.2		mg/kg
											BA_T_R	Barium, Total Recoverable	800		mg/kg
											CD_T_R	Cadmium, Total Recoverable	1.8		mg/kg
											CR_T_R	Chromium, Total Recoverable	23.5		mg/kg
											CO_T_R	Cobalt, Total Recoverable	10.7 J	J	mg/kg
											CU_T_R	Copper, Total Recoverable	87.7		mg/kg
											FE_T_R	Iron, Total Recoverable	20600		mg/kg
											PB_T_R	Lead, Total Recoverable	39.2		mg/kg
											MN_T_R	Manganese, Total Recoverable	1150		mg/kg
											HG_T_R	Mercury, Total Recoverable	0.76		mg/kg
											NI_T_R	Nickel, Total Recoverable	31.2		mg/kg
											AG_T_R	Silver, Total Recoverable	ND(1.4)		mg/kg
											ZN_T_R	Zinc, Total Recoverable	136		mg/kg
TS-SS-01	TS-SS-01 (6-8 ft)	BP-TS-SS-01-06	10163483	10163483002	7/12/2011	Soil	991334.57	824297.71	6	8	MOISTURE	Soil Moisture	10.3		%
											SB_T_R	Antimony, Total Recoverable	7.5		mg/kg
											AS_T_R	Arsenic, Total Recoverable	11.5		mg/kg
											BA_T_R	Barium, Total Recoverable	130		mg/kg
											CD_T_R	Cadmium, Total Recoverable	0.31		mg/kg
											CR_T_R	Chromium, Total Recoverable	4.8		mg/kg
											CO_T_R	Cobalt, Total Recoverable	3.1 J	J	mg/kg
											CU_T_R	Copper, Total Recoverable	19		mg/kg
											FE_T_R	Iron, Total Recoverable	6920		mg/kg
											PB_T_R	Lead, Total Recoverable	28.6		mg/kg
											MN_T_R	Manganese, Total Recoverable	660		mg/kg
											HG_T_R	Mercury, Total Recoverable	0.047 J	J	mg/kg
											NI_T_R	Nickel, Total Recoverable	5.1		mg/kg
											AG_T_R	Silver, Total Recoverable	1.5		mg/kg
											ZN_T_R	Zinc, Total Recoverable	32.3		mg/kg
TS-SS-02	TS-SS-02 (2-4 ft)	BP-TS-SS-02-02	10163483	10163483005	7/12/2011	Soil			2	4	MOISTURE	Soil Moisture	8.6		%
											SB_T_R	Antimony, Total Recoverable	109		mg/kg
											AS_T_R	Arsenic, Total Recoverable	79.8		mg/kg
											BA_T_R	Barium, Total Recoverable	146		mg/kg
											CD_T_R	Cadmium, Total Recoverable	3		mg/kg
											CR_T_R	Chromium, Total Recoverable	4.1		mg/kg
											CO_T_R	Cobalt, Total Recoverable	3 J	J	mg/kg
											CU_T_R	Copper, Total Recoverable	189		mg/kg
											FE_T_R	Iron, Total Recoverable	7240		mg/kg
											PB_T_R	Lead, Total Recoverable	328		mg/kg
											MN_T_R	Manganese, Total Recoverable	325		mg/kg
											HG_T_R	Mercury, Total Recoverable	1 J	J	mg/kg
											NI_T_R	Nickel, Total Recoverable	4.8		mg/kg
											AG_T_R	Silver, Total Recoverable	17.7		mg/kg
											ZN_T_R	Zinc, Total Recoverable	56.6		mg/kg

APPENDIX B-4. SOLID-MATRIX ANALYTICAL RESULTS
TIM SMITH MINE AOC
BLACK PINE MINE

Location	Sample ID	Field Sample ID	Lab Batch ID	Lab Sample ID	Date Sampled	Matrix	X	Y	Sample Start Depth	Sample End Depth	Tri Cas	Analyte[a]	Value	Reviewer	Units
TS-SS-03	TS-SS-03 (3-5 ft)	BP-TS-SS-03-03	10163483	10163483003	7/12/2011	Soil	991327.96	824180.93	3	5	MOISTURE	Soil Moisture	14.5		%
											SB_T_R	Antimony, Total Recoverable	5.7		mg/kg
											AS_T_R	Arsenic, Total Recoverable	11.5		mg/kg
											BA_T_R	Barium, Total Recoverable	154		mg/kg
											CD_T_R	Cadmium, Total Recoverable	0.87		mg/kg
											CR_T_R	Chromium, Total Recoverable	7.5		mg/kg
											CO_T_R	Cobalt, Total Recoverable	3.5 J	J	mg/kg
											CU_T_R	Copper, Total Recoverable	730		mg/kg
											FE_T_R	Iron, Total Recoverable	11400		mg/kg
											PB_T_R	Lead, Total Recoverable	65.7		mg/kg
											MN_T_R	Manganese, Total Recoverable	457		mg/kg
											HG_T_R	Mercury, Total Recoverable	0.029 J	J	mg/kg
											NI_T_R	Nickel, Total Recoverable	6.5		mg/kg
											AG_T_R	Silver, Total Recoverable	ND(0.58)		mg/kg
											ZN_T_R	Zinc, Total Recoverable	72.4		mg/kg
TS-SS-07	TS-SS-07 (1-3 ft)	BP-TS-SS-07-01	10163483	10163483008	7/13/2011	Soil	992112.32	826172.09	1	3	MOISTURE	Soil Moisture	10		%
											SB_T_R	Antimony, Total Recoverable	64.2		mg/kg
											AS_T_R	Arsenic, Total Recoverable	73.6		mg/kg
											BA_T_R	Barium, Total Recoverable	84.1		mg/kg
											CD_T_R	Cadmium, Total Recoverable	0.14		mg/kg
											CR_T_R	Chromium, Total Recoverable	10.1		mg/kg
											CO_T_R	Cobalt, Total Recoverable	3.6 J	J	mg/kg
											CU_T_R	Copper, Total Recoverable	28.2		mg/kg
											FE_T_R	Iron, Total Recoverable	14600		mg/kg
											PB_T_R	Lead, Total Recoverable	200		mg/kg
											MN_T_R	Manganese, Total Recoverable	217		mg/kg
											HG_T_R	Mercury, Total Recoverable	0.69 J	J	mg/kg
											NI_T_R	Nickel, Total Recoverable	6		mg/kg
											AG_T_R	Silver, Total Recoverable	12.8		mg/kg
											ZN_T_R	Zinc, Total Recoverable	36.3		mg/kg
TS-SS-08	TS-SS-08 (1-3 ft)	BP-TS-SS-08-01	10163483	10163483006	7/13/2011	Soil	992041.28	826111.05	1	3	MOISTURE	Soil Moisture	14		%
											SB_T_R	Antimony, Total Recoverable	23		mg/kg
											AS_T_R	Arsenic, Total Recoverable	47.4		mg/kg
											BA_T_R	Barium, Total Recoverable	92.5		mg/kg
											CD_T_R	Cadmium, Total Recoverable	0.15		mg/kg
											CR_T_R	Chromium, Total Recoverable	17.8		mg/kg
											CO_T_R	Cobalt, Total Recoverable	9.3 J	J	mg/kg
											CU_T_R	Copper, Total Recoverable	63		mg/kg
											FE_T_R	Iron, Total Recoverable	21000		mg/kg
											PB_T_R	Lead, Total Recoverable	147		mg/kg
											MN_T_R	Manganese, Total Recoverable	109		mg/kg
											HG_T_R	Mercury, Total Recoverable	0.15 J	J	mg/kg
											NI_T_R	Nickel, Total Recoverable	9		mg/kg
											AG_T_R	Silver, Total Recoverable	2.1		mg/kg
											ZN_T_R	Zinc, Total Recoverable	62.1		mg/kg

[a] Silver was included in original laboratory analytical reports, but was removed in revised reports by the laboratory

J – Estimated concentration

UJ – Estimated reporting limit

ft - feet

meq/100g - milliequivalents per hundred grams

mg/kg - milligrams per kilogram

mmhos/cm - micromhos per centimeter

% - percent

ND() - Analyte was not detected (reporting limit)

Std Units - Standard Units

t/1000t - tons per thousand tons

APPENDIX B5

SURFACE WATER-MATRIX ANALYTICAL RESULTS, TIM SMITH MINE AOC

APPENDIX B-5. SURFACE WATER-MATRIX ANALYTICAL RESULTS
TIM SMITH MINE AOC
BLACK PINE MINE

Location	Sample ID	Field Sample ID	Lab Batch ID	Lab Sample ID	Date Sampled	Matrix	X	Y	Tri Cas	Analyte[a]	Value	Reviewer Qualifier	Units
TSP-3	TSP-3	TSP-3	10160707	10160707005	6/13/2011	Water	989432.59	823797.606	ACIDITY	Acidity	8,200		ug/L
									ALKLNTY	Alkalinity	11,900		ug/L
									SB_T_R	Antimony, Total Recoverable	0.53		ug/L
									AS_T_R	Arsenic, Total Recoverable	1.2		ug/L
									BA_T_R	Barium, Total Recoverable	85.1		ug/L
									CD_T_R	Cadmium, Total Recoverable	0.14		ug/L
									CR_T_R	Chromium, Total Recoverable	1.7		ug/L
									CU_T_R	Copper, Total Recoverable	30.5		ug/L
									FE_T_R	Iron, Total Recoverable	1,180 J	J	ug/L
									PB_T_R	Lead, Total Recoverable	0.86 JB	JB	ug/L
									MN_T_R	Manganese, Total Recoverable	11.5		ug/L
									NI_T_R	Nickel, Total Recoverable	2.1		ug/L
									AG_T_R	Silver, Total Recoverable	ND(0.5)		ug/L
									TDS	Solids, Total Dissolved	80,000		ug/L
									TSS	Solids, Total Suspended	3,100		ug/L
									SULFATE	Sulfate	4,900		ug/L
									ZN_T_R	Zinc, Total Recoverable	10.4		ug/L
									FLOW	Flow	1956.77		gpm
									O2_DIS	Oxygen, Dissolved	9.9		mg/L
									TEMP	Temperature	8.8		oC
									PH	pH	7.3		Std Units
									SPCON_F	Conductance Field	30		umhos/cm
			10160851	10160851005					HG_T_R	Mercury, Total Recoverable	0.0128		ug/L
TSP-6	TSP-6	TSP-6	10160673	10160673004	6/14/2011	Water	987859.714	825256.19	ACIDITY	Acidity	12,000		ug/L
									ALKLNTY	Alkalinity	12,100		ug/L
									SB_T_R	Antimony, Total Recoverable	0.53		ug/L
									AS_T_R	Arsenic, Total Recoverable	1.1		ug/L
									BA_T_R	Barium, Total Recoverable	85.4		ug/L
									CD_T_R	Cadmium, Total Recoverable	ND(0.08)		ug/L
									CR_T_R	Chromium, Total Recoverable	1.3		ug/L
									CU_T_R	Copper, Total Recoverable	22.5		ug/L
									FE_T_R	Iron, Total Recoverable	1,000		ug/L
									PB_T_R	Lead, Total Recoverable	0.97 JB	JB	ug/L
									MN_T_R	Manganese, Total Recoverable	8.9		ug/L
									NI_T_R	Nickel, Total Recoverable	2.2		ug/L
									AG_T_R	Silver, Total Recoverable	ND(0.5)		ug/L
									TDS	Solids, Total Dissolved	101,000		ug/L
									TSS	Solids, Total Suspended	2,700		ug/L
									SULFATE	Sulfate	4,200		ug/L
									ZN_T_R	Zinc, Total Recoverable	8.2		ug/L
									FLOW	Flow	2019.6		gpm
									O2_DIS	Oxygen, Dissolved	10		mg/L
									TEMP	Temperature	10.2		oC
									PH	pH	7.48		Std Units
									SPCON_F	Conductance Field	31		umhos/cm
			10160851	10160851002					HG_T_R	Mercury, Total Recoverable	0.0132		ug/L

APPENDIX B-5. SURFACE WATER-MATRIX ANALYTICAL RESULTS
TIM SMITH MINE AOC
BLACK PINE MINE

Location	Sample ID	Field Sample ID	Lab Batch ID	Lab Sample ID	Date Sampled	Matrix	X	Y	Tri Cas	Analyte[a]	Value	Reviewer Qualifier	Units
TSP-8	TSP-8	TSP-8	10160707	10160707001	6/13/2011	Water	990839.035	824292.65	ACIDITY	Acidity	12,000		ug/L
									ALKLNTY	Alkalinity	13,400		ug/L
									SB_T_R	Antimony, Total Recoverable	1.2		ug/L
									AS_T_R	Arsenic, Total Recoverable	1.7		ug/L
									BA_T_R	Barium, Total Recoverable	83.5		ug/L
									CD_T_R	Cadmium, Total Recoverable	0.28		ug/L
									CR_T_R	Chromium, Total Recoverable	2.3		ug/L
									CU_T_R	Copper, Total Recoverable	24.2		ug/L
									HARDNESS	Hardness, Total	17,800		ug/L
									FE_T_R	Iron, Total Recoverable	2,130 J	J	ug/L
									PB_T_R	Lead, Total Recoverable	1.8 JB	JB	ug/L
									MN_T_R	Manganese, Total Recoverable	13.6		ug/L
									NI_T_R	Nickel, Total Recoverable	3.4		ug/L
									AG_T_R	Silver, Total Recoverable	ND(0.5)		ug/L
									TDS	Solids, Total Dissolved	125,000		ug/L
									TSS	Solids, Total Suspended	1,500		ug/L
									SULFATE	Sulfate	10,100		ug/L
									ZN_T_R	Zinc, Total Recoverable	22.3		ug/L
									FLOW	Flow	300.696		gpm
									O2_DIS	Oxygen, Dissolved	8.4		mg/L
									TEMP	Temperature	11.3		oC
									PH	pH	7.23		Std Units
									SPCON_F	Conductance Field	35		umhos/cm
			10160851	10160851003					HG_T_R	Mercury, Total Recoverable	0.0208		ug/L
TSP-9	TSP-9	TSP-9	10160707	10160707007	6/13/2011	Water	991859.77	`	ACIDITY	Acidity	13,900		ug/L
									ALKLNTY	Alkalinity	15,200		ug/L
									SB_T_R	Antimony, Total Recoverable	0.57		ug/L
									AS_T_R	Arsenic, Total Recoverable	1.7		ug/L
									BA_T_R	Barium, Total Recoverable	86.7		ug/L
									CD_T_R	Cadmium, Total Recoverable	0.25		ug/L
									CR_T_R	Chromium, Total Recoverable	2.9		ug/L
									CU_T_R	Copper, Total Recoverable	8.9		ug/L
									FE_T_R	Iron, Total Recoverable	2,780 J	J	ug/L
									PB_T_R	Lead, Total Recoverable	1.5 JB	JB	ug/L
									MN_T_R	Manganese, Total Recoverable	18.8		ug/L
									NI_T_R	Nickel, Total Recoverable	4.2		ug/L
									AG_T_R	Silver, Total Recoverable	ND(0.5)		ug/L
									TDS	Solids, Total Dissolved	122,000		ug/L
									TSS	Solids, Total Suspended	4,100		ug/L
									SULFATE	Sulfate	4,100		ug/L
									ZN_T_R	Zinc, Total Recoverable	19		ug/L
									FLOW	Flow	228.888		gpm
									O2_DIS	Oxygen, Dissolved	9.2		mg/L
									TEMP	Temperature	10.9		oC
									PH	pH	6.65		Std Units
									SPCON_F	Conductance Field	34		umhos/cm
			10160851	10160851006					HG_T_R	Mercury, Total Recoverable	0.0199		ug/L

APPENDIX B-5. SURFACE WATER-MATRIX ANALYTICAL RESULTS
TIM SMITH MINE AOC
BLACK PINE MINE

Location	Sample ID	Field Sample ID	Lab Batch ID	Lab Sample ID	Date Sampled	Matrix	X	Y	Tri Cas	Analyte[a]	Value	Reviewer Qualifier	Units
TSP-10	TSP-10	TSP-10	10158290	10158290009	5/19/2011	Water	993096.75	823644.40	FLOW	Flow	5		gpm
									TEMP	Temperature	8.17		oC
									PH	pH	5.95		Std Units
									ACIDITY	Acidity	ND(5,000)	UJ	ug/L
									ALKLNTY	Alkalinity	13,800		ug/L
									AS_T_R	Arsenic, Total Recoverable	2		ug/L
									CD_T_R	Cadmium, Total Recoverable	0.08		ug/L
									CA	Calcium, Total	3,280		ug/L
									CU_T_R	Copper, Total Recoverable	6.3 J	J	ug/L
									FE_T_R	Iron, Total Recoverable	2,990 J	J	ug/L
									PB_T_R	Lead, Total Recoverable	2.7		ug/L
									MG	Magnesium, Total	2,130 J	J	ug/L
									MN_T_R	Manganese, Total Recoverable	52.6		ug/L
									O2_DIS	Oxygen, Dissolved	14,400		ug/L
									K	Potassium, Total	1,500 J	J	ug/L
									NA	Sodium, Total	2,050 J	J	ug/L
									TDS	Solids, Total Dissolved	100,000		ug/L
									TSS	Solids, Total Suspended	28,100 J	J	ug/L
									SULFATE	Sulfate	3,300		ug/L
									ZN_T_R	Zinc, Total Recoverable	17.1 J	J	ug/L
									SPCON_F	Conductance Field	41		umhos/cm

[a] Silver was included in original laboratory analytical reports, but was removed in revised reports by the laboratory

J – Estimated concentration

JB – Estimated concentration due to blank contamination

UJ – Estimated reporting limit

oC - degrees Celsius

gpm - gallons per minute

ug/L - micrograms per liter

umhos/cm - micro hmos per centimeter

Std Units - Standard units

ND() - Analyte was not detected (reporting limit)

APPENDIX B6

SOLID-MATRIX ANALYTICAL RESULTS, HISTORIC MINE AOC

APPENDIX B-6. SOLID-MATRIX ANALYTICAL RESULTS
HISTORIC MINE AOC
BLACK PINE MINE

Location	Sample ID	Field Sample ID	Lab Batch ID	Lab Sample ID	Date Sampled	Matrix	X	Y	Sample Start Depth	Sample End Depth	Tri Cas	Analyte[a]	Value	Reviewer	Units
HM-RS-01	HM-RS-01 (8-10 ft)	BP-HM-RS-01-08	10163606	10163606007	7/13/2011	Soil	994023.10	825570.24	8	10	MOISTURE	Soil Moisture	14.1		%
											SULFUR_EX_HCL	Sulfur (HCL Extraction)	ND(0.05)		%
											SULFUR_EX_HNO3	Sulfur (HNO3 Extraction)	ND(0.05)		%
											SULFUR_HOTWATER_HNO3	Sulfur (Hot Water Extraction)	ND(0.05)		%
											SULFUR_RES	Sulfur, Residual	ND(0.05)		%
											SULFUR	Sulfur, Total	ND(0.05)		%
											SB_T_R	Antimony, Total Recoverable	1.2		mg/kg
											AS_T_R	Arsenic, Total Recoverable	7.9		mg/kg
											BA_T_R	Barium, Total Recoverable	126		mg/kg
											CD_T_R	Cadmium, Total Recoverable	0.36		mg/kg
											CR_T_R	Chromium, Total Recoverable	9.9		mg/kg
											CO_T_R	Cobalt, Total Recoverable	7		mg/kg
											CU_T_R	Copper, Total Recoverable	71.5		mg/kg
											FE_T_R	Iron, Total Recoverable	19800		mg/kg
											PB_T_R	Lead, Total Recoverable	8.6		mg/kg
											MN_T_R	Manganese, Total Recoverable	119		mg/kg
											HG_T_R	Mercury, Total Recoverable	0.077 J	J	mg/kg
											NI_T_R	Nickel, Total Recoverable	13.6		mg/kg
											AG_T_R	Silver, Total Recoverable	ND(0.48)		mg/kg
											ZN_T_R	Zinc, Total Recoverable	47.9		mg/kg
											PH_SMPBUFFER	pH, SMP Buffer	6.7		Std Units
											ACIDBASE_POT	Acid Base Potential	0.74		t/1000t
											ACIDITY_POT	Acid Potential	ND(4.3)		t/1000t
											NEUT_POT	Neutralization Potential	0.74		t/1000t
											01305-78-8_REC	Recommended Lime	ND(5.4)		t/1000t
											SMPLIME_REQ	SMP Lime Requirement	1.8		t/1000t
HM-RS-01	HM-RS-01 (16-17 ft)	BP-HM-RS-01-16.5	10163606	10163606006	7/13/2011	Soil	994023.10	825570.24	16	17	MOISTURE	Soil Moisture	19.6		%
											SB_T_R	Antimony, Total Recoverable	1.1		mg/kg
											AS_T_R	Arsenic, Total Recoverable	6.1		mg/kg
											BA_T_R	Barium, Total Recoverable	127		mg/kg
											CD_T_R	Cadmium, Total Recoverable	ND(0.073)		mg/kg
											CR_T_R	Chromium, Total Recoverable	13.1		mg/kg
											CO_T_R	Cobalt, Total Recoverable	9.5		mg/kg
											CU_T_R	Copper, Total Recoverable	12.1		mg/kg
											FE_T_R	Iron, Total Recoverable	21100		mg/kg
											PB_T_R	Lead, Total Recoverable	9.6		mg/kg
											MN_T_R	Manganese, Total Recoverable	211		mg/kg
											HG_T_R	Mercury, Total Recoverable	0.046		mg/kg
											NI_T_R	Nickel, Total Recoverable	15.3		mg/kg
											AG_T_R	Silver, Total Recoverable	ND(0.45)		mg/kg
											ZN_T_R	Zinc, Total Recoverable	31.4		mg/kg

APPENDIX B-6. SOLID-MATRIX ANALYTICAL RESULTS
HISTORIC MINE AOC
BLACK PINE MINE

Location	Sample ID	Field Sample ID	Lab Batch ID	Lab Sample ID	Date Sampled	Matrix	X	Y	Sample Start Depth	Sample End Depth	Tri Cas	Analyte[a]	Value	Reviewer	Units
HM-RS-02	HM-RS-02 (1-3 ft)	BP-HM-RS-02-01	10163606	10163606008	7/13/2011	Soil	993889.40	825460.07	1	3	MOISTURE	Soil Moisture	15.3		%
											SULFUR_EX_HCL	Sulfur (HCL Extraction)	ND(0.05)		%
											SULFUR_EX_HNO3	Sulfur (HNO3 Extraction)	ND(0.05)		%
											SULFUR_HOTWATER_HNO3	Sulfur (Hot Water Extraction)	ND(0.05)		%
											SULFUR_RES	Sulfur, Residual	ND(0.05)		%
											SULFUR	Sulfur, Total	0.0529		%
											SB_T_R	Antimony, Total Recoverable	421		mg/kg
											AS_T_R	Arsenic, Total Recoverable	376		mg/kg
											BA_T_R	Barium, Total Recoverable	149		mg/kg
											CD_T_R	Cadmium, Total Recoverable	7.1		mg/kg
											CR_T_R	Chromium, Total Recoverable	2.7		mg/kg
											CO_T_R	Cobalt, Total Recoverable	4.7		mg/kg
											CU_T_R	Copper, Total Recoverable	1010		mg/kg
											FE_T_R	Iron, Total Recoverable	15900		mg/kg
											PB_T_R	Lead, Total Recoverable	1820		mg/kg
											MN_T_R	Manganese, Total Recoverable	740		mg/kg
											HG_T_R	Mercury, Total Recoverable	ND(0.021)	UJ	mg/kg
											NI_T_R	Nickel, Total Recoverable	6.7		mg/kg
											AG_T_R	Silver, Total Recoverable	104		mg/kg
											ZN_T_R	Zinc, Total Recoverable	71.2		mg/kg
											PH_SMPBUFFER	pH, SMP Buffer	6.2		Std Units
											ACIDBASE_POT	Acid Base Potential	1.7		t/1000t
											ACIDITY_POT	Acid Potential	ND(4.3)		t/1000t
											NEUT_POT	Neutralization Potential	1.7		t/1000t
											01305-78-8_REC	Recommended Lime	7.3		t/1000t
											SMPLIME_REQ	SMP Lime Requirement	5.3		t/1000t
HM-RS-02	HM-RS-02 (3-5 ft)	BP-HM-RS-02-03	10163606	10163606009	7/13/2011	Soil	993889.40	825460.07	3	5	MOISTURE	Soil Moisture	14.2		%
											SB_T_R	Antimony, Total Recoverable	2.7		mg/kg
											AS_T_R	Arsenic, Total Recoverable	11		mg/kg
											BA_T_R	Barium, Total Recoverable	147		mg/kg
											CD_T_R	Cadmium, Total Recoverable	0.23		mg/kg
											CR_T_R	Chromium, Total Recoverable	8.5		mg/kg
											CO_T_R	Cobalt, Total Recoverable	9.6		mg/kg
											CU_T_R	Copper, Total Recoverable	23.2		mg/kg
											FE_T_R	Iron, Total Recoverable	16500		mg/kg
											PB_T_R	Lead, Total Recoverable	34.8		mg/kg
											MN_T_R	Manganese, Total Recoverable	620		mg/kg
											HG_T_R	Mercury, Total Recoverable	3.5 J	J	mg/kg
											NI_T_R	Nickel, Total Recoverable	11.2		mg/kg
											AG_T_R	Silver, Total Recoverable	ND(0.42)		mg/kg
											ZN_T_R	Zinc, Total Recoverable	46.6		mg/kg

APPENDIX B-6. SOLID-MATRIX ANALYTICAL RESULTS
HISTORIC MINE AOC
BLACK PINE MINE

Location	Sample ID	Field Sample ID	Lab Batch ID	Lab Sample ID	Date Sampled	Matrix	X	Y	Sample Start Depth	Sample End Depth	Tri Cas	Analyte[a]	Value	Reviewer	Units
HM-RS-03	HM-RS-03 (1-3 ft)	BP-HM-RS-03-01	10163606	10163606002	7/13/2011	Soil	993995.64	825383.53	1	3	MOISTURE	Soil Moisture	8.4		%
											SULFUR_EX_HCL	Sulfur (HCL Extraction)	ND(0.05)		%
											SULFUR_EX_HNO3	Sulfur (HNO3 Extraction)	ND(0.05)		%
											SULFUR_HOTWATER_HNO3	Sulfur (Hot Water Extraction)	0.131		%
											SULFUR_RES	Sulfur, Residual	ND(0.05)		%
											SULFUR	Sulfur, Total	0.228		%
											SB_T_R	Antimony, Total Recoverable	1140		mg/kg
											AS_T_R	Arsenic, Total Recoverable	894		mg/kg
											BA_T_R	Barium, Total Recoverable	364		mg/kg
											CD_T_R	Cadmium, Total Recoverable	10.8		mg/kg
											CR_T_R	Chromium, Total Recoverable	ND(0.45)		mg/kg
											CO_T_R	Cobalt, Total Recoverable	0.77		mg/kg
											CU_T_R	Copper, Total Recoverable	925		mg/kg
											FE_T_R	Iron, Total Recoverable	24000		mg/kg
											PB_T_R	Lead, Total Recoverable	2800		mg/kg
											MN_T_R	Manganese, Total Recoverable	219		mg/kg
											HG_T_R	Mercury, Total Recoverable	1.2 J	J	mg/kg
											NI_T_R	Nickel, Total Recoverable	1.5		mg/kg
											AG_T_R	Silver, Total Recoverable	82.2		mg/kg
											ZN_T_R	Zinc, Total Recoverable	140		mg/kg
											PH_SMPBUFFER	pH, SMP Buffer	6.6		Std Units
											ACIDBASE_POT	Acid Base Potential	1.5		t/1000t
											ACIDITY_POT	Acid Potential	ND(4.3)		t/1000t
											NEUT_POT	Neutralization Potential	1.5		t/1000t
											01305-78-8_REC	Recommended Lime	6.3		t/1000t
											SMPLIME_REQ	SMP Lime Requirement	2.4		t/1000t
HM-RS-04	HM-RS-04 (7-9 ft)	BP-HM-RS-04-07	10163606	10163606004	7/13/2011	Soil	994084.38	825434.94	7	9	MOISTURE	Soil Moisture	15		%
											SULFUR_EX_HCL	Sulfur (HCL Extraction)	ND(0.05)		%
											SULFUR_EX_HNO3	Sulfur (HNO3 Extraction)	ND(0.05)		%
											SULFUR_HOTWATER_HNO3	Sulfur (Hot Water Extraction)	ND(0.05)		%
											SULFUR_RES	Sulfur, Residual	ND(0.05)		%
											SULFUR	Sulfur, Total	ND(0.05)		%
											SB_T_R	Antimony, Total Recoverable	39.1		mg/kg
											AS_T_R	Arsenic, Total Recoverable	43.9		mg/kg
											BA_T_R	Barium, Total Recoverable	160		mg/kg
											CD_T_R	Cadmium, Total Recoverable	0.88		mg/kg
											CR_T_R	Chromium, Total Recoverable	8.7		mg/kg
											CO_T_R	Cobalt, Total Recoverable	16.4		mg/kg
											CU_T_R	Copper, Total Recoverable	358		mg/kg
											FE_T_R	Iron, Total Recoverable	19600		mg/kg
											PB_T_R	Lead, Total Recoverable	216		mg/kg
											MN_T_R	Manganese, Total Recoverable	497		mg/kg
											HG_T_R	Mercury, Total Recoverable	0.34 J	J	mg/kg
											NI_T_R	Nickel, Total Recoverable	14.1		mg/kg
											AG_T_R	Silver, Total Recoverable	6.5		mg/kg
											ZN_T_R	Zinc, Total Recoverable	50.6		mg/kg
											PH_SMPBUFFER	pH, SMP Buffer	6.6		Std Units
											ACIDBASE_POT	Acid Base Potential	3.2		t/1000t
											ACIDITY_POT	Acid Potential	ND(4.3)		t/1000t
											NEUT_POT	Neutralization Potential	3.2		t/1000t
											01305-78-8_REC	Recommended Lime	ND(5.4)		t/1000t
											SMPLIME_REQ	SMP Lime Requirement	2.4		t/1000t

APPENDIX B-6. SOLID-MATRIX ANALYTICAL RESULTS
HISTORIC MINE AOC
BLACK PINE MINE

Location	Sample ID	Field Sample ID	Lab Batch ID	Lab Sample ID	Date Sampled	Matrix	X	Y	Sample Start Depth	Sample End Depth	Tri Cas	Analyte[a]	Value	Reviewer	Units
HM-RS-05	HM-RS-05 (2-4 ft)	BP-HM-RS-05-02	10163633	10163633003	7/13/2011	Soil	994651.73	825459.93	2	4	MOISTURE	Soil Moisture	11.9		%
											SULFUR_EX_HCL	Sulfur (HCL Extraction)	ND(0.05)		%
											SULFUR_EX_HNO3	Sulfur (HNO3 Extraction)	ND(0.05)		%
											SULFUR_HOTWATER_HNO3	Sulfur (Hot Water Extraction)	ND(0.05)		%
											SULFUR_RES	Sulfur, Residual	ND(0.05)		%
											SULFUR	Sulfur, Total	ND(0.05)		%
											SB_T_R	Antimony, Total Recoverable	50.3		mg/kg
											AS_T_R	Arsenic, Total Recoverable	61.3		mg/kg
											BA_T_R	Barium, Total Recoverable	153		mg/kg
											CD_T_R	Cadmium, Total Recoverable	1.2		mg/kg
											CR_T_R	Chromium, Total Recoverable	8.9		mg/kg
											CO_T_R	Cobalt, Total Recoverable	9.9 J	J	mg/kg
											CU_T_R	Copper, Total Recoverable	193		mg/kg
											FE_T_R	Iron, Total Recoverable	11700		mg/kg
											PB_T_R	Lead, Total Recoverable	401		mg/kg
											MN_T_R	Manganese, Total Recoverable	465		mg/kg
											HG_T_R	Mercury, Total Recoverable	0.094 J	J	mg/kg
											NI_T_R	Nickel, Total Recoverable	13.7		mg/kg
											AG_T_R	Silver, Total Recoverable	7.8		mg/kg
											ZN_T_R	Zinc, Total Recoverable	ND(104)		mg/kg
											PH_SMPBUFFER	pH, SMP Buffer	6.9		Std Units
											ACIDBASE_POT	Acid Base Potential	0.73		t/1000t
											ACIDITY_POT	Acid Potential	ND(4.3)		t/1000t
											NEUT_POT	Neutralization Potential	0.73		t/1000t
											01305-78-8_REC	Recommended Lime	ND(5.4)		t/1000t
											SMPLIME_REQ	SMP Lime Requirement	0.3		t/1000t
HM-RS-05	HM-RS-05 (5-7 ft)	BP-HM-RS-05-05	10163633	10163633004	7/13/2011	Soil	994651.73	825459.93	5	7	MOISTURE	Soil Moisture	9.2		%
											SB_T_R	Antimony, Total Recoverable	18.1		mg/kg
											AS_T_R	Arsenic, Total Recoverable	22.4		mg/kg
											BA_T_R	Barium, Total Recoverable	77.8		mg/kg
											CD_T_R	Cadmium, Total Recoverable	0.91		mg/kg
											CR_T_R	Chromium, Total Recoverable	7.7		mg/kg
											CO_T_R	Cobalt, Total Recoverable	5.3 J	J	mg/kg
											CU_T_R	Copper, Total Recoverable	57.9		mg/kg
											FE_T_R	Iron, Total Recoverable	9340		mg/kg
											PB_T_R	Lead, Total Recoverable	149		mg/kg
											MN_T_R	Manganese, Total Recoverable	197		mg/kg
											HG_T_R	Mercury, Total Recoverable	0.059 J	J	mg/kg
											NI_T_R	Nickel, Total Recoverable	8.5		mg/kg
											AG_T_R	Silver, Total Recoverable	3.7		mg/kg
											ZN_T_R	Zinc, Total Recoverable	26.2		mg/kg

APPENDIX B-6. SOLID-MATRIX ANALYTICAL RESULTS
HISTORIC MINE AOC
BLACK PINE MINE

Location	Sample ID	Field Sample ID	Lab Batch ID	Lab Sample ID	Date Sampled	Matrix	X	Y	Sample Start Depth	Sample End Depth	Tri Cas	Analyte[a]	Value	Reviewer	Units
HM-RS-06	HM-RS-06 (1-3 ft)	BP-HM-RS-06-01	10163633	10163633002	7/13/2011	Soil	994713.21	825391.57	1	3	MOISTURE	Soil Moisture	7.8		%
											SULFUR_EX_HCL	Sulfur (HCL Extraction)	ND(0.05)		%
											SULFUR_EX_HNO3	Sulfur (HNO3 Extraction)	ND(0.05)		%
											SULFUR_HOTWATER_HNO3	Sulfur (Hot Water Extraction)	0.0542		%
											SULFUR_RES	Sulfur, Residual	ND(0.05)		%
											SULFUR	Sulfur, Total	0.0912		%
											SB_T_R	Antimony, Total Recoverable	1020		mg/kg
											AS_T_R	Arsenic, Total Recoverable	1190		mg/kg
											BA_T_R	Barium, Total Recoverable	261		mg/kg
											CD_T_R	Cadmium, Total Recoverable	22.8		mg/kg
											CR_T_R	Chromium, Total Recoverable	4.1		mg/kg
											CO_T_R	Cobalt, Total Recoverable	2.8 J	J	mg/kg
											CU_T_R	Copper, Total Recoverable	3310		mg/kg
											FE_T_R	Iron, Total Recoverable	28900		mg/kg
											PB_T_R	Lead, Total Recoverable	4980		mg/kg
											MN_T_R	Manganese, Total Recoverable	682		mg/kg
											HG_T_R	Mercury, Total Recoverable	0.56 J	J	mg/kg
											NI_T_R	Nickel, Total Recoverable	ND(9.9)		mg/kg
											AG_T_R	Silver, Total Recoverable	175		mg/kg
											ZN_T_R	Zinc, Total Recoverable	395		mg/kg
											PH_SMPBUFFER	pH, SMP Buffer	6.9		Std Units
											ACIDBASE_POT	Acid Base Potential	0		t/1000t
											ACIDITY_POT	Acid Potential	ND(4.3)		t/1000t
											NEUT_POT	Neutralization Potential	ND(0.5)		t/1000t
											01305-78-8_REC	Recommended Lime	ND(5.4)		t/1000t
											SMPLIME_REQ	SMP Lime Requirement	0.3		t/1000t
HM-RS-06	HM-RS-06 (8-10 ft)	BP-HM-RS-06-08	10163633	10163633006	7/13/2011	Soil	994713.21	825391.57	8	10	MOISTURE	Soil Moisture	9.9		%
											SB_T_R	Antimony, Total Recoverable	188		mg/kg
											AS_T_R	Arsenic, Total Recoverable	209		mg/kg
											BA_T_R	Barium, Total Recoverable	155		mg/kg
											CD_T_R	Cadmium, Total Recoverable	4		mg/kg
											CR_T_R	Chromium, Total Recoverable	12.2		mg/kg
											CO_T_R	Cobalt, Total Recoverable	9.8 J	J	mg/kg
											CU_T_R	Copper, Total Recoverable	441		mg/kg
											FE_T_R	Iron, Total Recoverable	21000		mg/kg
											PB_T_R	Lead, Total Recoverable	1500		mg/kg
											MN_T_R	Manganese, Total Recoverable	282		mg/kg
											HG_T_R	Mercury, Total Recoverable	0.04 J	J	mg/kg
											NI_T_R	Nickel, Total Recoverable	14.9		mg/kg
											AG_T_R	Silver, Total Recoverable	22.1		mg/kg
											ZN_T_R	Zinc, Total Recoverable	ND(100)		mg/kg

APPENDIX B-6. SOLID-MATRIX ANALYTICAL RESULTS
HISTORIC MINE AOC
BLACK PINE MINE

Location	Sample ID	Field Sample ID	Lab Batch ID	Lab Sample ID	Date Sampled	Matrix	X	Y	Sample Start Depth	Sample End Depth	Tri Cas	Analyte[a]	Value	Reviewer	Units
HM-RS-07	HM-RS-07 (1-3 ft)	BP-HM-RS-07-01	10163633	10163633001	7/13/2011	Soil	994666.57	825303.47	1	3	MOISTURE	Soil Moisture	11		%
											SULFUR_EX_HCL	Sulfur (HCL Extraction)	0.0937		%
											SULFUR_EX_HNO3	Sulfur (HNO3 Extraction)	0.0559		%
											SULFUR_HOTWATER_HNO3	Sulfur (Hot Water Extraction)	0.183		%
											SULFUR_RES	Sulfur, Residual	ND(0.05)		%
											SULFUR	Sulfur, Total	0.339		%
											SB_T_R	Antimony, Total Recoverable	1380		mg/kg
											AS_T_R	Arsenic, Total Recoverable	1380		mg/kg
											BA_T_R	Barium, Total Recoverable	247		mg/kg
											CD_T_R	Cadmium, Total Recoverable	20.6		mg/kg
											CR_T_R	Chromium, Total Recoverable	2.7		mg/kg
											CO_T_R	Cobalt, Total Recoverable	1.1 J	J	mg/kg
											CU_T_R	Copper, Total Recoverable	1280		mg/kg
											FE_T_R	Iron, Total Recoverable	23100		mg/kg
											PB_T_R	Lead, Total Recoverable	6960		mg/kg
											MN_T_R	Manganese, Total Recoverable	270		mg/kg
											HG_T_R	Mercury, Total Recoverable	7 J	J	mg/kg
											NI_T_R	Nickel, Total Recoverable	ND(2.8)		mg/kg
											AG_T_R	Silver, Total Recoverable	319		mg/kg
											ZN_T_R	Zinc, Total Recoverable	332		mg/kg
											PH_SMPBUFFER	pH, SMP Buffer	6.3		Std Units
											ACIDBASE_POT	Acid Base Potential	0		t/1000t
											ACIDITY_POT	Acid Potential	ND(4.3)		t/1000t
											NEUT_POT	Neutralization Potential	ND(0.5)		t/1000t
											01305-78-8_REC	Recommended Lime	11		t/1000t
											SMPLIME_REQ	SMP Lime Requirement	4.6		t/1000t
HM-RS-08	HM-RS-08 (2-4 ft)	BP-HM-RS-08-02	10163483	10163483009	7/13/2011	Soil	993149.44	825455.09	2	4	MOISTURE	Soil Moisture	7.6		%
											SULFUR_EX_HCL	Sulfur (HCL Extraction)	ND(0.05)		%
											SULFUR_EX_HNO3	Sulfur (HNO3 Extraction)	ND(0.05)		%
											SULFUR_HOTWATER_HNO3	Sulfur (Hot Water Extraction)	ND(0.05)		%
											SULFUR_RES	Sulfur, Residual	ND(0.05)		%
											SULFUR	Sulfur, Total	ND(0.05)		%
											SB_T_R	Antimony, Total Recoverable	27.6		mg/kg
											AS_T_R	Arsenic, Total Recoverable	41.5		mg/kg
											BA_T_R	Barium, Total Recoverable	92.9		mg/kg
											CD_T_R	Cadmium, Total Recoverable	1.7		mg/kg
											CR_T_R	Chromium, Total Recoverable	12.3		mg/kg
											CO_T_R	Cobalt, Total Recoverable	8.5 J	J	mg/kg
											CU_T_R	Copper, Total Recoverable	329		mg/kg
											FE_T_R	Iron, Total Recoverable	12500		mg/kg
											PB_T_R	Lead, Total Recoverable	614		mg/kg
											MN_T_R	Manganese, Total Recoverable	412		mg/kg
											HG_T_R	Mercury, Total Recoverable	0.57 J	J	mg/kg
											NI_T_R	Nickel, Total Recoverable	9.9		mg/kg
											AG_T_R	Silver, Total Recoverable	3.6		mg/kg
											ZN_T_R	Zinc, Total Recoverable	191		mg/kg
											PH_SMPBUFFER	pH, SMP Buffer	6.8		Std Units
											ACIDBASE_POT	Acid Base Potential	6		t/1000t
											ACIDITY_POT	Acid Potential	ND(4.3)		t/1000t
											NEUT_POT	Neutralization Potential	6		t/1000t
											01305-78-8_REC	Recommended Lime	ND(5.4)		t/1000t
											SMPLIME_REQ	SMP Lime Requirement	1		t/1000t

APPENDIX B-6. SOLID-MATRIX ANALYTICAL RESULTS
HISTORIC MINE AOC
BLACK PINE MINE

Location	Sample ID	Field Sample ID	Lab Batch ID	Lab Sample ID	Date Sampled	Matrix	X	Y	Sample Start Depth	Sample End Depth	Tri Cas	Analyte[a]	Value	Reviewer	Units
HM-SD-01	HM-SD-01 (0-0.5 ft)	HM-SD-01	10160707	10160707009	6/13/2011	Sediment	992849.33	826967.21	0	0.5	MOISTURE	Soil Moisture	65.2		%
											SB_T_R	Antimony, Total Recoverable	20		mg/kg
											AS_T_R	Arsenic, Total Recoverable	24.8		mg/kg
											BA_T_R	Barium, Total Recoverable	752		mg/kg
											CD_T_R	Cadmium, Total Recoverable	4.9 J	J	mg/kg
											CR_T_R	Chromium, Total Recoverable	20.7		mg/kg
											CO_T_R	Cobalt, Total Recoverable	9.8 J	J	mg/kg
											CU_T_R	Copper, Total Recoverable	2780		mg/kg
											FE_T_R	Iron, Total Recoverable	21400		mg/kg
											PB_T_R	Lead, Total Recoverable	305		mg/kg
											MN_T_R	Manganese, Total Recoverable	2780		mg/kg
											HG_T_R	Mercury, Total Recoverable	27.4		mg/kg
											NI_T_R	Nickel, Total Recoverable	26.8		mg/kg
											AG_T_R	Silver, Total Recoverable	3.4 J	J	mg/kg
											ZN_T_R	Zinc, Total Recoverable	272		mg/kg
HM-SS-03	HM-SS-03 (3-5 ft)	BP-HM-SS-03-03	10163606	10163606001	7/13/2011	Soil	993995.64	825383.53	3	5	MOISTURE	Soil Moisture	12.2		%
											SB_T_R	Antimony, Total Recoverable	25.8		mg/kg
											AS_T_R	Arsenic, Total Recoverable	143		mg/kg
											BA_T_R	Barium, Total Recoverable	132		mg/kg
											CD_T_R	Cadmium, Total Recoverable	1.3		mg/kg
											CR_T_R	Chromium, Total Recoverable	8.1		mg/kg
											CO_T_R	Cobalt, Total Recoverable	7.2		mg/kg
											CU_T_R	Copper, Total Recoverable	547		mg/kg
											FE_T_R	Iron, Total Recoverable	15000		mg/kg
											PB_T_R	Lead, Total Recoverable	339		mg/kg
											MN_T_R	Manganese, Total Recoverable	352		mg/kg
											HG_T_R	Mercury, Total Recoverable	0.86 J	J	mg/kg
											NI_T_R	Nickel, Total Recoverable	9.4		mg/kg
											AG_T_R	Silver, Total Recoverable	3.3		mg/kg
											ZN_T_R	Zinc, Total Recoverable	85.6		mg/kg
HM-SS-04	HM-SS-04 (10-12 ft)	BP-HM-SS-04-10	10163606	10163606003	7/13/2011	Soil	994084.38	825434.94	10	12	MOISTURE	Soil Moisture	15.4		%
											SB_T_R	Antimony, Total Recoverable	2.2		mg/kg
											AS_T_R	Arsenic, Total Recoverable	7.2		mg/kg
											BA_T_R	Barium, Total Recoverable	182		mg/kg
											CD_T_R	Cadmium, Total Recoverable	ND(0.073)		mg/kg
											CR_T_R	Chromium, Total Recoverable	21.4		mg/kg
											CO_T_R	Cobalt, Total Recoverable	8.9		mg/kg
											CU_T_R	Copper, Total Recoverable	12.9		mg/kg
											FE_T_R	Iron, Total Recoverable	23700		mg/kg
											PB_T_R	Lead, Total Recoverable	13.5		mg/kg
											MN_T_R	Manganese, Total Recoverable	400		mg/kg
											HG_T_R	Mercury, Total Recoverable	0.04 J	J	mg/kg
											NI_T_R	Nickel, Total Recoverable	18.3		mg/kg
											AG_T_R	Silver, Total Recoverable	0.57		mg/kg
											ZN_T_R	Zinc, Total Recoverable	36.1		mg/kg

APPENDIX B-6. SOLID-MATRIX ANALYTICAL RESULTS
HISTORIC MINE AOC
BLACK PINE MINE

Location	Sample ID	Field Sample ID	Lab Batch ID	Lab Sample ID	Date Sampled	Matrix	X	Y	Sample Start Depth	Sample End Depth	Tri Cas	Analyte[a]	Value	Reviewer	Units
HM-SS-07	HM-SS-07 (3-5 ft)	BP-HM-SS-07-03	10163633	10163633005	7/13/2011	Soil	994666.57	825303.47	3	5	MOISTURE	Soil Moisture	21.5		%
											SB_T_R	Antimony, Total Recoverable	142		mg/kg
											AS_T_R	Arsenic, Total Recoverable	154		mg/kg
											BA_T_R	Barium, Total Recoverable	433		mg/kg
											CD_T_R	Cadmium, Total Recoverable	5.9		mg/kg
											CR_T_R	Chromium, Total Recoverable	7		mg/kg
											CO_T_R	Cobalt, Total Recoverable	6.8 J	J	mg/kg
											CU_T_R	Copper, Total Recoverable	3440		mg/kg
											FE_T_R	Iron, Total Recoverable	12300		mg/kg
											PB_T_R	Lead, Total Recoverable	1020		mg/kg
											MN_T_R	Manganese, Total Recoverable	2320		mg/kg
											HG_T_R	Mercury, Total Recoverable	8.5 J	J	mg/kg
											NI_T_R	Nickel, Total Recoverable	10.9		mg/kg
											AG_T_R	Silver, Total Recoverable	26.5		mg/kg
											ZN_T_R	Zinc, Total Recoverable	124		mg/kg
HM-SS-09	HM-SS-09 (0-0.5 ft)	HM-SS-09	10163635	10163635004	7/13/2011	Soil	993822.10	825698.29	0	0.5	MOISTURE	Soil Moisture	17.2		%
											SULFUR_EX_HCL	Sulfur (HCL Extraction)	ND(0.05)		%
											SULFUR_EX_HNO3	Sulfur (HNO3 Extraction)	ND(0.05)		%
											SULFUR_HOTWATER_HNO3	Sulfur (Hot Water Extraction)	ND(0.05)		%
											SULFUR_RES	Sulfur, Residual	ND(0.05)		%
											SULFUR	Sulfur, Total	ND(0.05)		%
											SB_T_R	Antimony, Total Recoverable	20.6		mg/kg
											AS_T_R	Arsenic, Total Recoverable	33.8		mg/kg
											BA_T_R	Barium, Total Recoverable	179		mg/kg
											CD_T_R	Cadmium, Total Recoverable	2.2		mg/kg
											CR_T_R	Chromium, Total Recoverable	9.5		mg/kg
											CO_T_R	Cobalt, Total Recoverable	7.2		mg/kg
											CU_T_R	Copper, Total Recoverable	1390		mg/kg
											FE_T_R	Iron, Total Recoverable	13000		mg/kg
											PB_T_R	Lead, Total Recoverable	375		mg/kg
											MN_T_R	Manganese, Total Recoverable	782		mg/kg
											HG_T_R	Mercury, Total Recoverable	0.57 J	J	mg/kg
											NI_T_R	Nickel, Total Recoverable	10.4		mg/kg
											AG_T_R	Silver, Total Recoverable	5		mg/kg
											ZN_T_R	Zinc, Total Recoverable	136		mg/kg
											PH_SMPBUFFER	pH, SMP Buffer	6		Std Units
											ACIDBASE_POT	Acid Base Potential	0		t/1000t
											ACIDITY_POT	Acid Potential	ND(4.3)		t/1000t
											NEUT_POT	Neutralization Potential	ND(0.5)		t/1000t
											01305-78-8_REC	Recommended Lime	7.9		t/1000t
											SMPLIME_REQ	SMP Lime Requirement	6		t/1000t

APPENDIX B-6. SOLID-MATRIX ANALYTICAL RESULTS
HISTORIC MINE AOC
BLACK PINE MINE

Location	Sample ID	Field Sample ID	Lab Batch ID	Lab Sample ID	Date Sampled	Matrix	X	Y	Sample Start Depth	Sample End Depth	Tri Cas	Analyte[a]	Value	Reviewer	Units
HM-SS-10	HM-SS-10 (0-0.5 ft)	HM-SS-10	10163635	10163635003	7/13/2011	Soil	993852.87	825609.15	0	0.5	MOISTURE	Soil Moisture	17.7		%
											SULFUR_EX_HCL	Sulfur (HCL Extraction)	ND(0.05)		%
											SULFUR_EX_HNO3	Sulfur (HNO3 Extraction)	ND(0.05)		%
											SULFUR_HOTWATER_HNO3	Sulfur (Hot Water Extraction)	ND(0.05)		%
											SULFUR_RES	Sulfur, Residual	ND(0.05)		%
											SULFUR	Sulfur, Total	ND(0.05)		%
											SB_T_R	Antimony, Total Recoverable	5		mg/kg
											AS_T_R	Arsenic, Total Recoverable	8.6		mg/kg
											BA_T_R	Barium, Total Recoverable	241		mg/kg
											CD_T_R	Cadmium, Total Recoverable	1.6		mg/kg
											CR_T_R	Chromium, Total Recoverable	10.9		mg/kg
											CO_T_R	Cobalt, Total Recoverable	10.9		mg/kg
											CU_T_R	Copper, Total Recoverable	2080		mg/kg
											FE_T_R	Iron, Total Recoverable	13800		mg/kg
											PB_T_R	Lead, Total Recoverable	99.6		mg/kg
											MN_T_R	Manganese, Total Recoverable	1400		mg/kg
											HG_T_R	Mercury, Total Recoverable	0.029 J	J	mg/kg
											NI_T_R	Nickel, Total Recoverable	10.7		mg/kg
											AG_T_R	Silver, Total Recoverable	ND(0.58)		mg/kg
											ZN_T_R	Zinc, Total Recoverable	122		mg/kg
											PH_SMPBUFFER	pH, SMP Buffer	6.4		Std Units
											ACIDBASE_POT	Acid Base Potential	0		t/1000t
											ACIDITY_POT	Acid Potential	ND(4.3)		t/1000t
											NEUT_POT	Neutralization Potential	ND(0.5)		t/1000t
											01305-78-8_REC	Recommended Lime	ND(5.4)		t/1000t
											SMPLIME_REQ	SMP Lime Requirement	3.9		t/1000t
HM-SS-11	HM-SS-11 (0-0.5 ft)	HM-SS-11	10163635	10163635006	7/13/2011	Soil	994103.17	825558.82	0	0.5	MOISTURE	Soil Moisture	13.3		%
											SULFUR_EX_HCL	Sulfur (HCL Extraction)	ND(0.05)		%
											SULFUR_EX_HNO3	Sulfur (HNO3 Extraction)	ND(0.05)		%
											SULFUR_HOTWATER_HNO3	Sulfur (Hot Water Extraction)	ND(0.05)		%
											SULFUR_RES	Sulfur, Residual	ND(0.05)		%
											SULFUR	Sulfur, Total	ND(0.05)		%
											SB_T_R	Antimony, Total Recoverable	31.4		mg/kg
											AS_T_R	Arsenic, Total Recoverable	57.8		mg/kg
											BA_T_R	Barium, Total Recoverable	93.9		mg/kg
											CD_T_R	Cadmium, Total Recoverable	0.7		mg/kg
											CR_T_R	Chromium, Total Recoverable	4.6		mg/kg
											CO_T_R	Cobalt, Total Recoverable	2		mg/kg
											CU_T_R	Copper, Total Recoverable	283		mg/kg
											FE_T_R	Iron, Total Recoverable	6140		mg/kg
											PB_T_R	Lead, Total Recoverable	267		mg/kg
											MN_T_R	Manganese, Total Recoverable	254		mg/kg
											HG_T_R	Mercury, Total Recoverable	0.89 J	J	mg/kg
											NI_T_R	Nickel, Total Recoverable	3.9		mg/kg
											AG_T_R	Silver, Total Recoverable	6.7		mg/kg
											ZN_T_R	Zinc, Total Recoverable	32		mg/kg
											PH_SMPBUFFER	pH, SMP Buffer	6.2		Std Units
											ACIDBASE_POT	Acid Base Potential	0		t/1000t
											ACIDITY_POT	Acid Potential	ND(4.3)		t/1000t
											NEUT_POT	Neutralization Potential	ND(0.5)		t/1000t
											01305-78-8_REC	Recommended Lime	7.7		t/1000t
											SMPLIME_REQ	SMP Lime Requirement	5.3		t/1000t

APPENDIX B-6. SOLID-MATRIX ANALYTICAL RESULTS
HISTORIC MINE AOC
BLACK PINE MINE

Location	Sample ID	Field Sample ID	Lab Batch ID	Lab Sample ID	Date Sampled	Matrix	X	Y	Sample Start Depth	Sample End Depth	Tri Cas	Analyte[a]	Value	Reviewer	Units
HM-SS-12	HM-SS-12 (0-0.5 ft)	HM-SS-12	10163635	10163635005	7/13/2011	Soil	993999.89	825658.74	0	0.5	MOISTURE	Soil Moisture	16.7		%
											SULFUR_EX_HCL	Sulfur (HCL Extraction)	ND(0.05)		%
											SULFUR_EX_HNO3	Sulfur (HNO3 Extraction)	ND(0.05)		%
											SULFUR_HOTWATER_HNO3	Sulfur (Hot Water Extraction)	ND(0.05)		%
											SULFUR_RES	Sulfur, Residual	ND(0.05)		%
											SULFUR	Sulfur, Total	ND(0.05)		%
											SB_T_R	Antimony, Total Recoverable	8.1		mg/kg
											AS_T_R	Arsenic, Total Recoverable	14.9		mg/kg
											BA_T_R	Barium, Total Recoverable	178		mg/kg
											CD_T_R	Cadmium, Total Recoverable	0.92		mg/kg
											CR_T_R	Chromium, Total Recoverable	7.4		mg/kg
											CO_T_R	Cobalt, Total Recoverable	4.6		mg/kg
											CU_T_R	Copper, Total Recoverable	389		mg/kg
											FE_T_R	Iron, Total Recoverable	9390		mg/kg
											PB_T_R	Lead, Total Recoverable	62.9		mg/kg
											MN_T_R	Manganese, Total Recoverable	463		mg/kg
											HG_T_R	Mercury, Total Recoverable	0.024 J	J	mg/kg
											NI_T_R	Nickel, Total Recoverable	8.8		mg/kg
											AG_T_R	Silver, Total Recoverable	1.6		mg/kg
											ZN_T_R	Zinc, Total Recoverable	69.3		mg/kg
											PH_SMPBUFFER	pH, SMP Buffer	6.5		Std Units
											ACIDBASE_POT	Acid Base Potential	0		t/1000t
											ACIDITY_POT	Acid Potential	ND(4.3)		t/1000t
											NEUT_POT	Neutralization Potential	ND(0.5)		t/1000t
											01305-78-8_REC	Recommended Lime	ND(5.4)		t/1000t
											SMPLIME_REQ	SMP Lime Requirement	3.1		t/1000t
HM-SS-13	HM-SS-13 (0-0.5 ft)	HM-SS-13	10163635	10163635007	7/14/2011	Soil	994753.99	825558.64	0	0.5	MOISTURE	Soil Moisture	14		%
											SULFUR_EX_HCL	Sulfur (HCL Extraction)	ND(0.05)		%
											SULFUR_EX_HNO3	Sulfur (HNO3 Extraction)	ND(0.05)		%
											SULFUR_HOTWATER_HNO3	Sulfur (Hot Water Extraction)	ND(0.05)		%
											SULFUR_RES	Sulfur, Residual	ND(0.05)		%
											SULFUR	Sulfur, Total	ND(0.05)		%
											SB_T_R	Antimony, Total Recoverable	254		mg/kg
											AS_T_R	Arsenic, Total Recoverable	316		mg/kg
											BA_T_R	Barium, Total Recoverable	305		mg/kg
											CD_T_R	Cadmium, Total Recoverable	6.6		mg/kg
											CR_T_R	Chromium, Total Recoverable	7.2		mg/kg
											CO_T_R	Cobalt, Total Recoverable	4.3		mg/kg
											CU_T_R	Copper, Total Recoverable	1420		mg/kg
											FE_T_R	Iron, Total Recoverable	15700		mg/kg
											PB_T_R	Lead, Total Recoverable	2210		mg/kg
											MN_T_R	Manganese, Total Recoverable	1240		mg/kg
											HG_T_R	Mercury, Total Recoverable	1 J	J	mg/kg
											NI_T_R	Nickel, Total Recoverable	9.2		mg/kg
											AG_T_R	Silver, Total Recoverable	42.2		mg/kg
											ZN_T_R	Zinc, Total Recoverable	181		mg/kg
											PH_SMPBUFFER	pH, SMP Buffer	6.6		Std Units
											ACIDBASE_POT	Acid Base Potential	2.9		t/1000t
											ACIDITY_POT	Acid Potential	ND(4.3)		t/1000t
											NEUT_POT	Neutralization Potential	2.9		t/1000t
											01305-78-8_REC	Recommended Lime	ND(5.4)		t/1000t
											SMPLIME_REQ	SMP Lime Requirement	2.4		t/1000t

APPENDIX B-6. SOLID-MATRIX ANALYTICAL RESULTS
HISTORIC MINE AOC
BLACK PINE MINE

Location	Sample ID	Field Sample ID	Lab Batch ID	Lab Sample ID	Date Sampled	Matrix	X	Y	Sample Start Depth	Sample End Depth	Tri Cas	Analyte[a]	Value	Reviewer	Units
HM-SS-14	HM-SS-14 (0-0.5 ft)	HM-SS-14	10163635	10163635008	7/14/2011	Soil	994692.82	825567.79	0	0.5	MOISTURE	Soil Moisture	14.7		%
											SULFUR_EX_HCL	Sulfur (HCL Extraction)	ND(0.05)		%
											SULFUR_EX_HNO3	Sulfur (HNO3 Extraction)	ND(0.05)		%
											SULFUR_HOTWATER_HNO3	Sulfur (Hot Water Extraction)	ND(0.05)		%
											SULFUR_RES	Sulfur, Residual	ND(0.05)		%
											SULFUR	Sulfur, Total	ND(0.05)		%
											SB_T_R	Antimony, Total Recoverable	149		mg/kg
											AS_T_R	Arsenic, Total Recoverable	141		mg/kg
											BA_T_R	Barium, Total Recoverable	254		mg/kg
											CD_T_R	Cadmium, Total Recoverable	2.3		mg/kg
											CR_T_R	Chromium, Total Recoverable	6.5		mg/kg
											CO_T_R	Cobalt, Total Recoverable	2.8		mg/kg
											CU_T_R	Copper, Total Recoverable	662		mg/kg
											FE_T_R	Iron, Total Recoverable	12800		mg/kg
											PB_T_R	Lead, Total Recoverable	857		mg/kg
											MN_T_R	Manganese, Total Recoverable	461		mg/kg
											HG_T_R	Mercury, Total Recoverable	0.26 J	J	mg/kg
											NI_T_R	Nickel, Total Recoverable	10.4		mg/kg
											AG_T_R	Silver, Total Recoverable	30.5		mg/kg
											ZN_T_R	Zinc, Total Recoverable	135		mg/kg
											PH_SMPBUFFER	pH, SMP Buffer	6.5		Std Units
											ACIDBASE_POT	Acid Base Potential	0		t/1000t
											ACIDITY_POT	Acid Potential	ND(4.3)		t/1000t
											NEUT_POT	Neutralization Potential	ND(0.5)		t/1000t
											01305-78-8_REC	Recommended Lime	ND(5.4)		t/1000t
											SMPLIME_REQ	SMP Lime Requirement	3.1		t/1000t
HM-SS-15	HM-SS-15 (0-0.5 ft)	BP-HM-SS-15-00	10163483	10163483010	7/13/2011	Soil	993212.56	825536.16	0	0.5	MOISTURE	Soil Moisture	8.5		%
											SULFUR_EX_HCL	Sulfur (HCL Extraction)	0.0746		%
											SULFUR_EX_HNO3	Sulfur (HNO3 Extraction)	0.175		%
											SULFUR_HOTWATER_HNO3	Sulfur (Hot Water Extraction)	ND(0.05)		%
											SULFUR_RES	Sulfur, Residual	ND(0.05)		%
											SULFUR	Sulfur, Total	0.183		%
											SB_T_R	Antimony, Total Recoverable	594		mg/kg
											AS_T_R	Arsenic, Total Recoverable	501		mg/kg
											BA_T_R	Barium, Total Recoverable	218		mg/kg
											CD_T_R	Cadmium, Total Recoverable	7.3		mg/kg
											CR_T_R	Chromium, Total Recoverable	3.1		mg/kg
											CO_T_R	Cobalt, Total Recoverable	0.63 J	J	mg/kg
											CU_T_R	Copper, Total Recoverable	505		mg/kg
											FE_T_R	Iron, Total Recoverable	27400		mg/kg
											PB_T_R	Lead, Total Recoverable	2050		mg/kg
											MN_T_R	Manganese, Total Recoverable	46.5		mg/kg
											HG_T_R	Mercury, Total Recoverable	3.6 J	J	mg/kg
											NI_T_R	Nickel, Total Recoverable	2		mg/kg
											AG_T_R	Silver, Total Recoverable	144		mg/kg
											ZN_T_R	Zinc, Total Recoverable	326		mg/kg
											PH_SMPBUFFER	pH, SMP Buffer	6.5		Std Units
											ACIDBASE_POT	Acid Base Potential	-7.5		t/1000t
											ACIDITY_POT	Acid Potential	7.5		t/1000t
											NEUT_POT	Neutralization Potential	ND(0.5)		t/1000t
											01305-78-8_REC	Recommended Lime	13		t/1000t
											SMPLIME_REQ	SMP Lime Requirement	3.1		t/1000t

APPENDIX B-6. SOLID-MATRIX ANALYTICAL RESULTS
HISTORIC MINE AOC
BLACK PINE MINE

Location	Sample ID	Field Sample ID	Lab Batch ID	Lab Sample ID	Date Sampled	Matrix	X	Y	Sample Start Depth	Sample End Depth	Tri Cas	Analyte[a]	Value	Reviewer	Units
HM-SS-16	HM-SS-16 (0-0.5 ft)	HM-SS-16	10163635	10163635009	7/14/2011	Soil	993290.94	825396.09	0	0.5	MOISTURE	Soil Moisture	6.9		%
											SULFUR_EX_HCL	Sulfur (HCL Extraction)	ND(0.05)		%
											SULFUR_EX_HNO3	Sulfur (HNO3 Extraction)	0.255		%
											SULFUR_HOTWATER_HNO3	Sulfur (Hot Water Extraction)	0.312		%
											SULFUR_RES	Sulfur, Residual	ND(0.05)		%
											SULFUR	Sulfur, Total	0.452		%
											SB_T_R	Antimony, Total Recoverable	1160		mg/kg
											AS_T_R	Arsenic, Total Recoverable	1140		mg/kg
											BA_T_R	Barium, Total Recoverable	228		mg/kg
											CD_T_R	Cadmium, Total Recoverable	11.4		mg/kg
											CR_T_R	Chromium, Total Recoverable	2.3		mg/kg
											CO_T_R	Cobalt, Total Recoverable	0.43		mg/kg
											CU_T_R	Copper, Total Recoverable	1530		mg/kg
											FE_T_R	Iron, Total Recoverable	53600		mg/kg
											PB_T_R	Lead, Total Recoverable	4900		mg/kg
											MN_T_R	Manganese, Total Recoverable	64.8		mg/kg
											HG_T_R	Mercury, Total Recoverable	13 J	J	mg/kg
											NI_T_R	Nickel, Total Recoverable	1.1		mg/kg
											AG_T_R	Silver, Total Recoverable	140		mg/kg
											ZN_T_R	Zinc, Total Recoverable	297		mg/kg
											PH_SMPBUFFER	pH, SMP Buffer	6.2		Std Units
											ACIDBASE_POT	Acid Base Potential	-8.2		t/1000t
											ACIDITY_POT	Acid Potential	8.2		t/1000t
											NEUT_POT	Neutralization Potential	ND(0.5)		t/1000t
											01305-78-8_REC	Recommended Lime	16.9		t/1000t
											SMPLIME_REQ	SMP Lime Requirement	5.3		t/1000t

[a] Silver was included in original laboratory analytical reports, but was removed in revised reports by the laboratory

J – Estimated concentration
UJ – Estimated reporting limit
ft - feet
meq/100g - milliequivalents per hundred grams
mg/kg - milligrams per kilogram
mmhos/cm - micromhos per centimeter
% - percent
ND() - Analyte was not detected (reporting limit)
Std Units - Standard Units
t/1000t - tons per thousand tons

APPENDIX B7

SURFACE WATER-MATRIX ANALYTICAL RESULTS, HISTORIC MINE AOC

APPENDIX B-7. SURFACE WATER-MATRIX ANALYTICAL RESULTS
HISTORIC MINE AOC
BLACK PINE MINE

Location	Sample ID	Field Sample ID	Lab Batch ID	Lab Sample ID	Date Sampled	Matrix	X	Y	Tri Cas	Analyte[a]	Value	Reviewer Qualifier	Units
MCSP-1	MCSP-1	MCSP-1	10160707	10160707008	6/13/2011	Water	992849.3321	826967.211	ACIDITY	Acidity	25,200		ug/L
									ALKLNTY	Alkalinity	8,900		ug/L
									SB_T_R	Antimony, Total Recoverable	1.4		ug/L
									AS_T_R	Arsenic, Total Recoverable	1.6		ug/L
									BA_T_R	Barium, Total Recoverable	65.7		ug/L
									CD_T_R	Cadmium, Total Recoverable	0.26		ug/L
									CR_T_R	Chromium, Total Recoverable	1.5		ug/L
									CU_T_R	Copper, Total Recoverable	107		ug/L
									HARDNESS	Hardness, Total	17,800		ug/L
									FE_T_R	Iron, Total Recoverable	1,080 J	J	ug/L
									PB_T_R	Lead, Total Recoverable	2.9 JB	JB	ug/L
									MN_T_R	Manganese, Total Recoverable	15.4		ug/L
									NI_T_R	Nickel, Total Recoverable	2.3		ug/L
									AG_T_R	Silver, Total Recoverable	ND(0.5)		ug/L
									TDS	Solids, Total Dissolved	105,000		ug/L
									TSS	Solids, Total Suspended	5,300		ug/L
									SULFATE	Sulfate	11,400		ug/L
									ZN_T_R	Zinc, Total Recoverable	31.4		ug/L
									FLOW	Flow	175.032		gpm
									O2_DIS	Oxygen, Dissolved	NM		mg/L
									PH	pH	NM		Std Units
									SPCON_F	Conductance Field	NM		umhos/cm
									TEMP	Temperature	NM		oC
			10160851	10160851008					HG_T_R	Mercury, Total Recoverable	0.045		ug/L
Road cut	Road cut	ROAD CUT	10158290	10158290013	5/19/2011	Water	992119.23	826789.34	TEMP	Temperature	6.62		oC
									PH	pH	6.13		Std Units
									ACIDITY	Acidity	11,100 J	J	ug/L
									ALKLNTY	Alkalinity	13,100		ug/L
									AS_T_R	Arsenic, Total Recoverable	3.3		ug/L
									CD_T_R	Cadmium, Total Recoverable	ND(0.08)		ug/L
									CA	Calcium, Total	3,190		ug/L
									CU_T_R	Copper, Total Recoverable	16.8 J	J	ug/L
									FE_T_R	Iron, Total Recoverable	1,810 J	J	ug/L
									PB_T_R	Lead, Total Recoverable	5.3		ug/L
									MG	Magnesium, Total	1,560 J	J	ug/L
									MN_T_R	Manganese, Total Recoverable	16		ug/L
									O2_DIS	Oxygen, Dissolved	17,490		ug/L
									K	Potassium, Total	1,700 J	J	ug/L
									NA	Sodium, Total	2,270 J	J	ug/L
									TDS	Solids, Total Dissolved	58,000		ug/L
									TSS	Solids, Total Suspended	7,300 J	J	ug/L
									SULFATE	Sulfate	6,700		ug/L
									ZN_T_R	Zinc, Total Recoverable	9.2 J	J	ug/L
									SPCON_F	Conductance Field	41		umhos/cm

[a] Silver was included in original laboratory analytical reports, but was removed in revised reports by the laboratory

J – Estimated concentration

JB – Estimated concentration due to blank contamination

UJ – Estimated reporting limit

oC - degrees Celsius

gpm - gallons per minute

ug/L - micrograms per liter

umhos/cm - micro hmos per centimeter

Std Units - Standard units

ND() - Analyte was not detected (reporting limit)

APPENDIX B8

SOLID-MATRIX ANALYTICAL RESULTS, COMBINATION MILL AOC

APPENDIX B-8. SOLID-MATRIX ANALYTICAL RESULTS
COMBINATION MILL AOC
BLACK PINE MINE

Location	Sample ID	Field Sample ID	Lab Batch ID	Lab Sample ID	Date Sampled	Matrix	X	Y	Sample Start Depth	Sample End Depth	Tri Cas	Analyte	Value	Reviewer	Units
CML-SD-01	CML-SD-01 (0-0.5 ft)	CML-SD-01	10160673	10160673012	6/14/2011	Sediment	989313.06	838754.65	0	0.5	MOISTURE	Soil Moisture	15.2		%
											SB_T_R	Antimony, Total Recoverable	317		mg/kg
											AS_T_R	Arsenic, Total Recoverable	223		mg/kg
											BA_T_R	Barium, Total Recoverable	74.5		mg/kg
											CD_T_R	Cadmium, Total Recoverable	4.8		mg/kg
											CR_T_R	Chromium, Total Recoverable	6.2		mg/kg
											CO_T_R	Cobalt, Total Recoverable	7.6 J	J	mg/kg
											CU_T_R	Copper, Total Recoverable	378		mg/kg
											FE_T_R	Iron, Total Recoverable	14400		mg/kg
											PB_T_R	Lead, Total Recoverable	826		mg/kg
											MN_T_R	Manganese, Total Recoverable	413		mg/kg
											HG_T_R	Mercury, Total Recoverable	17.6		mg/kg
											NI_T_R	Nickel, Total Recoverable	3.9		mg/kg
											AG_T_R	Silver, Total Recoverable	11.2		mg/kg
											ZN_T_R	Zinc, Total Recoverable	188		mg/kg
CML-SD-02	CML-SD-02 (0-0.5 ft)	CML-SD-02	10160673	10160673013	6/15/2011	Sediment	988686.08	831557.87	0	0.5	MOISTURE	Soil Moisture	29.6		%
											SB_T_R	Antimony, Total Recoverable	461		mg/kg
											AS_T_R	Arsenic, Total Recoverable	417		mg/kg
											BA_T_R	Barium, Total Recoverable	308		mg/kg
											CD_T_R	Cadmium, Total Recoverable	8.9		mg/kg
											CR_T_R	Chromium, Total Recoverable	8.4		mg/kg
											CO_T_R	Cobalt, Total Recoverable	10.9 J	J	mg/kg
											CU_T_R	Copper, Total Recoverable	1430		mg/kg
											FE_T_R	Iron, Total Recoverable	22700		mg/kg
											PB_T_R	Lead, Total Recoverable	1970		mg/kg
											MN_T_R	Manganese, Total Recoverable	744		mg/kg
											HG_T_R	Mercury, Total Recoverable	13.6		mg/kg
											NI_T_R	Nickel, Total Recoverable	6.9		mg/kg
											AG_T_R	Silver, Total Recoverable	25.6		mg/kg
											ZN_T_R	Zinc, Total Recoverable	317		mg/kg
CML-SD-03	CML-SD-03 (0-0.5 ft)	BP-CML-SD-03-00	10160673	10160673014	6/15/2011	Sediment	988786.48	829207.60	0	0.5	MOISTURE	Soil Moisture	43.8		%
											SB_T_R	Antimony, Total Recoverable	16.8		mg/kg
											AS_T_R	Arsenic, Total Recoverable	19.4		mg/kg
											BA_T_R	Barium, Total Recoverable	143		mg/kg
											CD_T_R	Cadmium, Total Recoverable	0.43		mg/kg
											CR_T_R	Chromium, Total Recoverable	20.7		mg/kg
											CO_T_R	Cobalt, Total Recoverable	7.6 J	J	mg/kg
											CU_T_R	Copper, Total Recoverable	57.9		mg/kg
											FE_T_R	Iron, Total Recoverable	22300		mg/kg
											PB_T_R	Lead, Total Recoverable	207		mg/kg
											MN_T_R	Manganese, Total Recoverable	404		mg/kg
											HG_T_R	Mercury, Total Recoverable	4.1		mg/kg
											NI_T_R	Nickel, Total Recoverable	9.1		mg/kg
											AG_T_R	Silver, Total Recoverable	1.6		mg/kg
											ZN_T_R	Zinc, Total Recoverable	40.5		mg/kg

APPENDIX B-8. SOLID-MATRIX ANALYTICAL RESULTS
COMBINATION MILL AOC
BLACK PINE MINE

Location	Sample ID	Field Sample ID	Lab Batch ID	Lab Sample ID	Date Sampled	Matrix	X	Y	Sample Start Depth	Sample End Depth	Tri Cas	Analyte	Value	Reviewer	Units
CML-SD-04	CML-SD-04 (0-0.5 ft)	BP-CML-SD-04-00	10160673	10160673001	6/14/2011	Sediment	988269.43	828557.35	0	0.5	MOISTURE	Soil Moisture	67.7		%
											SB_T_R	Antimony, Total Recoverable	16.7		mg/kg
											AS_T_R	Arsenic, Total Recoverable	27.9		mg/kg
											BA_T_R	Barium, Total Recoverable	335		mg/kg
											CD_T_R	Cadmium, Total Recoverable	1.4		mg/kg
											CR_T_R	Chromium, Total Recoverable	8.3		mg/kg
											CO_T_R	Cobalt, Total Recoverable	19.3 J	J	mg/kg
											CU_T_R	Copper, Total Recoverable	109		mg/kg
											FE_T_R	Iron, Total Recoverable	12400		mg/kg
											PB_T_R	Lead, Total Recoverable	74.2		mg/kg
											MN_T_R	Manganese, Total Recoverable	1980		mg/kg
											HG_T_R	Mercury, Total Recoverable	14.4		mg/kg
											NI_T_R	Nickel, Total Recoverable	11.4		mg/kg
											AG_T_R	Silver, Total Recoverable	2.2		mg/kg
											ZN_T_R	Zinc, Total Recoverable	144		mg/kg
CML-SD-05	CML-SD-05 (0-0.5 ft)	BP-CML-SD-05-00	10160673	10160673002	6/14/2011	Sediment	987789.32	825202.77	0	0.5	MOISTURE	Soil Moisture	43.7		%
											SB_T_R	Antimony, Total Recoverable	ND(0.64)		mg/kg
											AS_T_R	Arsenic, Total Recoverable	12		mg/kg
											BA_T_R	Barium, Total Recoverable	452		mg/kg
											CD_T_R	Cadmium, Total Recoverable	1.2		mg/kg
											CR_T_R	Chromium, Total Recoverable	11.8		mg/kg
											CO_T_R	Cobalt, Total Recoverable	8.1 J	J	mg/kg
											CU_T_R	Copper, Total Recoverable	26.8		mg/kg
											FE_T_R	Iron, Total Recoverable	14500		mg/kg
											PB_T_R	Lead, Total Recoverable	16.3		mg/kg
											MN_T_R	Manganese, Total Recoverable	1160		mg/kg
											HG_T_R	Mercury, Total Recoverable	0.38		mg/kg
											NI_T_R	Nickel, Total Recoverable	13.4		mg/kg
											AG_T_R	Silver, Total Recoverable	ND(0.64)		mg/kg
											ZN_T_R	Zinc, Total Recoverable	96.8		mg/kg
CML-SD-06	CML-SD-06 (0-0.5 ft)	CML-SD-06-00	10160707	10160707004	6/13/2011	Sediment	988475.47	829216.35	0	0.5	MOISTURE	Soil Moisture	55.8		%
											SB_T_R	Antimony, Total Recoverable	891		mg/kg
											AS_T_R	Arsenic, Total Recoverable	642		mg/kg
											BA_T_R	Barium, Total Recoverable	353		mg/kg
											CD_T_R	Cadmium, Total Recoverable	28.6 J	J	mg/kg
											CR_T_R	Chromium, Total Recoverable	8.2		mg/kg
											CO_T_R	Cobalt, Total Recoverable	7.6 J	J	mg/kg
											CU_T_R	Copper, Total Recoverable	3620		mg/kg
											FE_T_R	Iron, Total Recoverable	21200		mg/kg
											PB_T_R	Lead, Total Recoverable	3760		mg/kg
											MN_T_R	Manganese, Total Recoverable	602		mg/kg
											HG_T_R	Mercury, Total Recoverable	32.8		mg/kg
											NI_T_R	Nickel, Total Recoverable	14.6		mg/kg
											AG_T_R	Silver, Total Recoverable	64.6 J	J	mg/kg
											ZN_T_R	Zinc, Total Recoverable	768		mg/kg

APPENDIX B-8. SOLID-MATRIX ANALYTICAL RESULTS
COMBINATION MILL AOC
BLACK PINE MINE

Location	Sample ID	Field Sample ID	Lab Batch ID	Lab Sample ID	Date Sampled	Matrix	X	Y	Sample Start Depth	Sample End Depth	Tri Cas	Analyte	Value	Reviewer	Units
CML-SD-07	CML-SD-07 (0-0.5 ft)	CML-SD-07	10160673	10160673009	6/14/2011	Sediment	988475.47	830441.94	0	0.5	MOISTURE	Soil Moisture	35.8		%
											SB_T_R	Antimony, Total Recoverable	817		mg/kg
											AS_T_R	Arsenic, Total Recoverable	596		mg/kg
											BA_T_R	Barium, Total Recoverable	340		mg/kg
											CD_T_R	Cadmium, Total Recoverable	15.4		mg/kg
											CR_T_R	Chromium, Total Recoverable	8.3		mg/kg
											CO_T_R	Cobalt, Total Recoverable	10.4 J	J	mg/kg
											CU_T_R	Copper, Total Recoverable	5320		mg/kg
											FE_T_R	Iron, Total Recoverable	21800		mg/kg
											PB_T_R	Lead, Total Recoverable	4240		mg/kg
											MN_T_R	Manganese, Total Recoverable	1180		mg/kg
											HG_T_R	Mercury, Total Recoverable	10.1		mg/kg
											NI_T_R	Nickel, Total Recoverable	6.1		mg/kg
											AG_T_R	Silver, Total Recoverable	37.6		mg/kg
											ZN_T_R	Zinc, Total Recoverable	393		mg/kg
CML-SD-08	CML-SD-08 (0-0.5 ft)	CML-SD-08	10160673	10160673010	6/14/2011	Sediment	987914.93	836670.88	0	0.5	MOISTURE	Soil Moisture	36.5		%
											SB_T_R	Antimony, Total Recoverable	613		mg/kg
											AS_T_R	Arsenic, Total Recoverable	553		mg/kg
											BA_T_R	Barium, Total Recoverable	244		mg/kg
											CD_T_R	Cadmium, Total Recoverable	11.5		mg/kg
											CR_T_R	Chromium, Total Recoverable	5.6		mg/kg
											CO_T_R	Cobalt, Total Recoverable	6.7 J	J	mg/kg
											CU_T_R	Copper, Total Recoverable	1390		mg/kg
											FE_T_R	Iron, Total Recoverable	20100		mg/kg
											PB_T_R	Lead, Total Recoverable	2960		mg/kg
											MN_T_R	Manganese, Total Recoverable	443		mg/kg
											HG_T_R	Mercury, Total Recoverable	12.1		mg/kg
											NI_T_R	Nickel, Total Recoverable	5.8		mg/kg
											AG_T_R	Silver, Total Recoverable	34.8		mg/kg
											ZN_T_R	Zinc, Total Recoverable	430		mg/kg
CML-SD-09	CML-SD-09 (0-0.5 ft)	CML-SD-09	10160673	10160673007	6/14/2011	Sediment	987927.78	836610.15	0	0.5	MOISTURE	Soil Moisture	26.1		%
											SB_T_R	Antimony, Total Recoverable	465		mg/kg
											AS_T_R	Arsenic, Total Recoverable	377		mg/kg
											BA_T_R	Barium, Total Recoverable	163		mg/kg
											CD_T_R	Cadmium, Total Recoverable	7.8		mg/kg
											CR_T_R	Chromium, Total Recoverable	5.4		mg/kg
											CO_T_R	Cobalt, Total Recoverable	7.8 J	J	mg/kg
											CU_T_R	Copper, Total Recoverable	920		mg/kg
											FE_T_R	Iron, Total Recoverable	15400		mg/kg
											PB_T_R	Lead, Total Recoverable	2070		mg/kg
											MN_T_R	Manganese, Total Recoverable	452		mg/kg
											HG_T_R	Mercury, Total Recoverable	5.4		mg/kg
											NI_T_R	Nickel, Total Recoverable	5.2		mg/kg
											AG_T_R	Silver, Total Recoverable	23.9		mg/kg
											ZN_T_R	Zinc, Total Recoverable	287		mg/kg

APPENDIX B-8. SOLID-MATRIX ANALYTICAL RESULTS
COMBINATION MILL AOC
BLACK PINE MINE

Location	Sample ID	Field Sample ID	Lab Batch ID	Lab Sample ID	Date Sampled	Matrix	X	Y	Sample Start Depth	Sample End Depth	Tri Cas	Analyte	Value	Reviewer	Units
CML-SD-10	CML-SD-10 (0-0.5 ft)	CML-SD-10	10160673	10160673008	6/14/2011	Sediment	988519.66	834758.14	0	0.5	MOISTURE	Soil Moisture	30.1		%
											SB_T_R	Antimony, Total Recoverable	596		mg/kg
											AS_T_R	Arsenic, Total Recoverable	492		mg/kg
											BA_T_R	Barium, Total Recoverable	185		mg/kg
											CD_T_R	Cadmium, Total Recoverable	10.3		mg/kg
											CR_T_R	Chromium, Total Recoverable	5.2		mg/kg
											CO_T_R	Cobalt, Total Recoverable	6.2 J	J	mg/kg
											CU_T_R	Copper, Total Recoverable	1160		mg/kg
											FE_T_R	Iron, Total Recoverable	19700		mg/kg
											PB_T_R	Lead, Total Recoverable	2460		mg/kg
											MN_T_R	Manganese, Total Recoverable	419		mg/kg
											HG_T_R	Mercury, Total Recoverable	7		mg/kg
											NI_T_R	Nickel, Total Recoverable	4.9		mg/kg
											AG_T_R	Silver, Total Recoverable	38.2		mg/kg
											ZN_T_R	Zinc, Total Recoverable	401		mg/kg
CML-SD-11	CML-SD-11 (0-0.5 ft)	CML-SD-11	10160673	10160673011	6/14/2011	Sediment	989035.55	832376.49	0	0.5	MOISTURE	Soil Moisture	21		%
											SB_T_R	Antimony, Total Recoverable	307		mg/kg
											AS_T_R	Arsenic, Total Recoverable	219		mg/kg
											BA_T_R	Barium, Total Recoverable	145		mg/kg
											CD_T_R	Cadmium, Total Recoverable	4.6		mg/kg
											CR_T_R	Chromium, Total Recoverable	6.1		mg/kg
											CO_T_R	Cobalt, Total Recoverable	11.5 J	J	mg/kg
											CU_T_R	Copper, Total Recoverable	623		mg/kg
											FE_T_R	Iron, Total Recoverable	16300		mg/kg
											PB_T_R	Lead, Total Recoverable	1170		mg/kg
											MN_T_R	Manganese, Total Recoverable	1210		mg/kg
											HG_T_R	Mercury, Total Recoverable	21.1		mg/kg
											NI_T_R	Nickel, Total Recoverable	6.5		mg/kg
											AG_T_R	Silver, Total Recoverable	14.8		mg/kg
											ZN_T_R	Zinc, Total Recoverable	248		mg/kg
CML-SD-13	CML-SD-13 (0-0.5 ft)	CML-SD-13-00	10160756	10160756008	6/16/2011	Sediment	987973.86	836622.85	0	0.5	MOISTURE	Soil Moisture	38.2		%
											SB_T_R	Antimony, Total Recoverable	440		mg/kg
											AS_T_R	Arsenic, Total Recoverable	339		mg/kg
											BA_T_R	Barium, Total Recoverable	229		mg/kg
											CD_T_R	Cadmium, Total Recoverable	7.7		mg/kg
											CR_T_R	Chromium, Total Recoverable	7.5		mg/kg
											CO_T_R	Cobalt, Total Recoverable	12.7		mg/kg
											CU_T_R	Copper, Total Recoverable	1210		mg/kg
											FE_T_R	Iron, Total Recoverable	17300		mg/kg
											PB_T_R	Lead, Total Recoverable	1690		mg/kg
											MN_T_R	Manganese, Total Recoverable	741		mg/kg
											HG_T_R	Mercury, Total Recoverable	17.4		mg/kg
											NI_T_R	Nickel, Total Recoverable	6.9		mg/kg
											AG_T_R	Silver, Total Recoverable	23.1		mg/kg
											ZN_T_R	Zinc, Total Recoverable	257		mg/kg

APPENDIX B-8. SOLID-MATRIX ANALYTICAL RESULTS
COMBINATION MILL AOC
BLACK PINE MINE

Location	Sample ID	Field Sample ID	Lab Batch ID	Lab Sample ID	Date Sampled	Matrix	X	Y	Sample Start Depth	Sample End Depth	Tri Cas	Analyte	Value	Reviewer	Units
CML-SD-14	CML-SD-14 (0-0.5 ft)	CML-SD-14-00	10160756	10160756010	6/16/2011	Sediment	988683.60	836351.89	0	0.5	MOISTURE	Soil Moisture	37.8		%
											SB_T_R	Antimony, Total Recoverable	1010		mg/kg
											AS_T_R	Arsenic, Total Recoverable	668		mg/kg
											BA_T_R	Barium, Total Recoverable	304		mg/kg
											CD_T_R	Cadmium, Total Recoverable	14.7		mg/kg
											CR_T_R	Chromium, Total Recoverable	4.9		mg/kg
											CO_T_R	Cobalt, Total Recoverable	3.6		mg/kg
											CU_T_R	Copper, Total Recoverable	2230		mg/kg
											FE_T_R	Iron, Total Recoverable	21700		mg/kg
											PB_T_R	Lead, Total Recoverable	3270		mg/kg
											MN_T_R	Manganese, Total Recoverable	257		mg/kg
											HG_T_R	Mercury, Total Recoverable	7.7		mg/kg
											NI_T_R	Nickel, Total Recoverable	3.2		mg/kg
											AG_T_R	Silver, Total Recoverable	51.5		mg/kg
											ZN_T_R	Zinc, Total Recoverable	403		mg/kg
CML-SD-15	CML-SD-15 (0-0.5 ft)	CML-SD-15-00	10160756	10160756007	6/16/2011	Sediment	988585.66	834660.72	0	0.5	MOISTURE	Soil Moisture	35.1		%
											SB_T_R	Antimony, Total Recoverable	1300		mg/kg
											AS_T_R	Arsenic, Total Recoverable	1250		mg/kg
											BA_T_R	Barium, Total Recoverable	1030		mg/kg
											CD_T_R	Cadmium, Total Recoverable	32.5		mg/kg
											CR_T_R	Chromium, Total Recoverable	6.5		mg/kg
											CO_T_R	Cobalt, Total Recoverable	1.9		mg/kg
											CU_T_R	Copper, Total Recoverable	4810		mg/kg
											FE_T_R	Iron, Total Recoverable	35900		mg/kg
											PB_T_R	Lead, Total Recoverable	8050		mg/kg
											MN_T_R	Manganese, Total Recoverable	342		mg/kg
											HG_T_R	Mercury, Total Recoverable	9.2		mg/kg
											NI_T_R	Nickel, Total Recoverable	4.1		mg/kg
											AG_T_R	Silver, Total Recoverable	213		mg/kg
											ZN_T_R	Zinc, Total Recoverable	1300		mg/kg
CML-SD-16	CML-SD-16 (0-0.5 ft)	CML-SD-16-00	10160756	10160756011	6/16/2011	Sediment	988876.52	831915.39	0	0.5	MOISTURE	Soil Moisture	31		%
											SB_T_R	Antimony, Total Recoverable	2130		mg/kg
											AS_T_R	Arsenic, Total Recoverable	1670		mg/kg
											BA_T_R	Barium, Total Recoverable	492		mg/kg
											CD_T_R	Cadmium, Total Recoverable	26.6		mg/kg
											CR_T_R	Chromium, Total Recoverable	2		mg/kg
											CO_T_R	Cobalt, Total Recoverable	0.66		mg/kg
											CU_T_R	Copper, Total Recoverable	5170		mg/kg
											FE_T_R	Iron, Total Recoverable	27700		mg/kg
											PB_T_R	Lead, Total Recoverable	7330		mg/kg
											MN_T_R	Manganese, Total Recoverable	171		mg/kg
											HG_T_R	Mercury, Total Recoverable	8		mg/kg
											NI_T_R	Nickel, Total Recoverable	0.69		mg/kg
											AG_T_R	Silver, Total Recoverable	73.1		mg/kg
											ZN_T_R	Zinc, Total Recoverable	313		mg/kg

APPENDIX B-8. SOLID-MATRIX ANALYTICAL RESULTS
COMBINATION MILL AOC
BLACK PINE MINE

Location	Sample ID	Field Sample ID	Lab Batch ID	Lab Sample ID	Date Sampled	Matrix	X	Y	Sample Start Depth	Sample End Depth	Tri Cas	Analyte	Value	Reviewer	Units
CML-SD-17	CML-SD-17 (0-0.5 ft)	CML-SD-17-00	10160756	10160756009	6/16/2011	Sediment	988659.81	831282.58	0	0.5	MOISTURE	Soil Moisture	38.6		%
											SB_T_R	Antimony, Total Recoverable	1090		mg/kg
											AS_T_R	Arsenic, Total Recoverable	745		mg/kg
											BA_T_R	Barium, Total Recoverable	317		mg/kg
											CD_T_R	Cadmium, Total Recoverable	17.1		mg/kg
											CR_T_R	Chromium, Total Recoverable	3.8		mg/kg
											CO_T_R	Cobalt, Total Recoverable	3.1		mg/kg
											CU_T_R	Copper, Total Recoverable	1910		mg/kg
											FE_T_R	Iron, Total Recoverable	23800		mg/kg
											PB_T_R	Lead, Total Recoverable	3880		mg/kg
											MN_T_R	Manganese, Total Recoverable	325		mg/kg
											HG_T_R	Mercury, Total Recoverable	10.5		mg/kg
											NI_T_R	Nickel, Total Recoverable	2.5		mg/kg
											AG_T_R	Silver, Total Recoverable	56.1		mg/kg
											ZN_T_R	Zinc, Total Recoverable	496		mg/kg
CML-SD-18	CML-SD-18 (0-0.5 ft)	CML-SD-18-00	10163437	10163437036	7/13/2011	Soil	988624.20	830688.17	0	0.5	MOISTURE	Soil Moisture	53.2		%
											SB_T_R	Antimony, Total Recoverable	76.1 J	J	mg/kg
											AS_T_R	Arsenic, Total Recoverable	211 J	J	mg/kg
											BA_T_R	Barium, Total Recoverable	793 J	J	mg/kg
											CD_T_R	Cadmium, Total Recoverable	14.8		mg/kg
											CR_T_R	Chromium, Total Recoverable	18.5		mg/kg
											CO_T_R	Cobalt, Total Recoverable	16.3		mg/kg
											CU_T_R	Copper, Total Recoverable	1070 J	J	mg/kg
											FE_T_R	Iron, Total Recoverable	29700		mg/kg
											PB_T_R	Lead, Total Recoverable	663 J	J	mg/kg
											MN_T_R	Manganese, Total Recoverable	1640		mg/kg
											HG_T_R	Mercury, Total Recoverable	11.6		mg/kg
											NI_T_R	Nickel, Total Recoverable	24.1		mg/kg
											AG_T_R	Silver, Total Recoverable	16.6		mg/kg
											ZN_T_R	Zinc, Total Recoverable	479 J	J	mg/kg
CML-SD-19	CML-SD-19 (0-0.5 ft)	CML-SD-19-00	10163437	10163437034	7/13/2011	Soil	988574.13	830739.22	0	0.5	MOISTURE	Soil Moisture	9.2		%
											SB_T_R	Antimony, Total Recoverable	614 J	J	mg/kg
											AS_T_R	Arsenic, Total Recoverable	442 J	J	mg/kg
											BA_T_R	Barium, Total Recoverable	238 J	J	mg/kg
											CD_T_R	Cadmium, Total Recoverable	15.4		mg/kg
											CR_T_R	Chromium, Total Recoverable	ND(2.8)		mg/kg
											CO_T_R	Cobalt, Total Recoverable	ND(2.8)		mg/kg
											CU_T_R	Copper, Total Recoverable	727 J	J	mg/kg
											FE_T_R	Iron, Total Recoverable	11900		mg/kg
											PB_T_R	Lead, Total Recoverable	2560 J	J	mg/kg
											MN_T_R	Manganese, Total Recoverable	264		mg/kg
											HG_T_R	Mercury, Total Recoverable	2.8		mg/kg
											NI_T_R	Nickel, Total Recoverable	ND(5.5)		mg/kg
											AG_T_R	Silver, Total Recoverable	47		mg/kg
											ZN_T_R	Zinc, Total Recoverable	238 J	J	mg/kg

APPENDIX B-8. SOLID-MATRIX ANALYTICAL RESULTS
COMBINATION MILL AOC
BLACK PINE MINE

Location	Sample ID	Field Sample ID	Lab Batch ID	Lab Sample ID	Date Sampled	Matrix	X	Y	Sample Start Depth	Sample End Depth	Tri Cas	Analyte	Value	Reviewer	Units
CML-SD-19	CML-SD-19 (2-3 ft)	CML-SD-19-02	10163437	10163437035	7/13/2011	Soil	988574.13	830739.22	2	3	MOISTURE	Soil Moisture	25.4		%
											SB_T_R	Antimony, Total Recoverable	21.1 J	J	mg/kg
											AS_T_R	Arsenic, Total Recoverable	43.6 J	J	mg/kg
											BA_T_R	Barium, Total Recoverable	317 J	J	mg/kg
											CD_T_R	Cadmium, Total Recoverable	6.8		mg/kg
											CR_T_R	Chromium, Total Recoverable	16.8		mg/kg
											CO_T_R	Cobalt, Total Recoverable	19.6		mg/kg
											CU_T_R	Copper, Total Recoverable	361 J	J	mg/kg
											FE_T_R	Iron, Total Recoverable	26900		mg/kg
											PB_T_R	Lead, Total Recoverable	197 J	J	mg/kg
											MN_T_R	Manganese, Total Recoverable	920		mg/kg
											HG_T_R	Mercury, Total Recoverable	3.4		mg/kg
											NI_T_R	Nickel, Total Recoverable	19.5		mg/kg
											AG_T_R	Silver, Total Recoverable	2.7		mg/kg
											ZN_T_R	Zinc, Total Recoverable	339 J	J	mg/kg
CML-SD-20	CML-SD-20 (0-0.5 ft)	CML-SD-20-00	10163437	10163437025	7/12/2011	Soil	988474.13	830739.22	0	0.5	MOISTURE	Soil Moisture	36.4		%
											SB_T_R	Antimony, Total Recoverable	528 J	J	mg/kg
											AS_T_R	Arsenic, Total Recoverable	617 J	J	mg/kg
											BA_T_R	Barium, Total Recoverable	430 J	J	mg/kg
											CD_T_R	Cadmium, Total Recoverable	25.9		mg/kg
											CR_T_R	Chromium, Total Recoverable	7.8		mg/kg
											CO_T_R	Cobalt, Total Recoverable	8.6		mg/kg
											CU_T_R	Copper, Total Recoverable	2430 J	J	mg/kg
											FE_T_R	Iron, Total Recoverable	19400		mg/kg
											PB_T_R	Lead, Total Recoverable	3720 J	J	mg/kg
											MN_T_R	Manganese, Total Recoverable	1280		mg/kg
											HG_T_R	Mercury, Total Recoverable	8.6		mg/kg
											NI_T_R	Nickel, Total Recoverable	ND(6.8)		mg/kg
											AG_T_R	Silver, Total Recoverable	50.7		mg/kg
											ZN_T_R	Zinc, Total Recoverable	335 J	J	mg/kg
CML-SD-20	CML-SD-20 (2-3 ft)	CML-SD-20-02	10163437	10163437026	7/12/2011	Soil	988474.13	830739.22	2	3	MOISTURE	Soil Moisture	27.5		%
											SB_T_R	Antimony, Total Recoverable	6.3 J	J	mg/kg
											AS_T_R	Arsenic, Total Recoverable	29.7 J	J	mg/kg
											BA_T_R	Barium, Total Recoverable	396 J	J	mg/kg
											CD_T_R	Cadmium, Total Recoverable	6.6		mg/kg
											CR_T_R	Chromium, Total Recoverable	15.5		mg/kg
											CO_T_R	Cobalt, Total Recoverable	21.3		mg/kg
											CU_T_R	Copper, Total Recoverable	136 J	J	mg/kg
											FE_T_R	Iron, Total Recoverable	27800		mg/kg
											PB_T_R	Lead, Total Recoverable	86.1 J	J	mg/kg
											MN_T_R	Manganese, Total Recoverable	1040		mg/kg
											HG_T_R	Mercury, Total Recoverable	7		mg/kg
											NI_T_R	Nickel, Total Recoverable	23.2		mg/kg
											AG_T_R	Silver, Total Recoverable	ND(2.8)		mg/kg
											ZN_T_R	Zinc, Total Recoverable	231 J	J	mg/kg

APPENDIX B-8. SOLID-MATRIX ANALYTICAL RESULTS
COMBINATION MILL AOC
BLACK PINE MINE

Location	Sample ID	Field Sample ID	Lab Batch ID	Lab Sample ID	Date Sampled	Matrix	X	Y	Sample Start Depth	Sample End Depth	Tri Cas	Analyte	Value	Reviewer	Units
CML-SD-21	CML-SD-21 (0-0.5 ft)	CML-SD-21-00	10163437	10163437024	7/12/2011	Soil	988374.13	830739.22	0	0.5	MOISTURE	Soil Moisture	24.3		%
											SB_T_R	Antimony, Total Recoverable	475 J	J	mg/kg
											AS_T_R	Arsenic, Total Recoverable	507 J	J	mg/kg
											BA_T_R	Barium, Total Recoverable	292 J	J	mg/kg
											CD_T_R	Cadmium, Total Recoverable	22.5		mg/kg
											CR_T_R	Chromium, Total Recoverable	5.6		mg/kg
											CO_T_R	Cobalt, Total Recoverable	5		mg/kg
											CU_T_R	Copper, Total Recoverable	1630 J	J	mg/kg
											FE_T_R	Iron, Total Recoverable	19200		mg/kg
											PB_T_R	Lead, Total Recoverable	2940 J	J	mg/kg
											MN_T_R	Manganese, Total Recoverable	474		mg/kg
											HG_T_R	Mercury, Total Recoverable	6.3		mg/kg
											NI_T_R	Nickel, Total Recoverable	6.3		mg/kg
											AG_T_R	Silver, Total Recoverable	43.6		mg/kg
											ZN_T_R	Zinc, Total Recoverable	413 J	J	mg/kg
CML-SD-22	CML-SD-22 (0-0.5 ft)	CML-SD-22-00	10163437	10163437031	7/13/2011	Soil	988647.45	830538.21	0	0.5	MOISTURE	Soil Moisture	21.9		%
											SB_T_R	Antimony, Total Recoverable	28.5 J	J	mg/kg
											AS_T_R	Arsenic, Total Recoverable	58.2 J	J	mg/kg
											BA_T_R	Barium, Total Recoverable	153 J	J	mg/kg
											CD_T_R	Cadmium, Total Recoverable	2.1		mg/kg
											CR_T_R	Chromium, Total Recoverable	12.2		mg/kg
											CO_T_R	Cobalt, Total Recoverable	9.9		mg/kg
											CU_T_R	Copper, Total Recoverable	154 J	J	mg/kg
											FE_T_R	Iron, Total Recoverable	22800		mg/kg
											PB_T_R	Lead, Total Recoverable	186 J	J	mg/kg
											MN_T_R	Manganese, Total Recoverable	610		mg/kg
											HG_T_R	Mercury, Total Recoverable	1.6		mg/kg
											NI_T_R	Nickel, Total Recoverable	7.7		mg/kg
											AG_T_R	Silver, Total Recoverable	ND(2.6)		mg/kg
											ZN_T_R	Zinc, Total Recoverable	118 J	J	mg/kg
CML-SD-23	CML-SD-23 (0-0.5 ft)	CML-SD-23-00	10163437	10163437032	7/13/2011	Soil	988574.13	830539.22	0	0.5	MOISTURE	Soil Moisture	21.5		%
											SB_T_R	Antimony, Total Recoverable	40.9 J	J	mg/kg
											AS_T_R	Arsenic, Total Recoverable	61.6 J	J	mg/kg
											BA_T_R	Barium, Total Recoverable	190 J	J	mg/kg
											CD_T_R	Cadmium, Total Recoverable	2.4		mg/kg
											CR_T_R	Chromium, Total Recoverable	22.1		mg/kg
											CO_T_R	Cobalt, Total Recoverable	11.6		mg/kg
											CU_T_R	Copper, Total Recoverable	249 J	J	mg/kg
											FE_T_R	Iron, Total Recoverable	31600		mg/kg
											PB_T_R	Lead, Total Recoverable	282 J	J	mg/kg
											MN_T_R	Manganese, Total Recoverable	568		mg/kg
											HG_T_R	Mercury, Total Recoverable	5.8		mg/kg
											NI_T_R	Nickel, Total Recoverable	10.5		mg/kg
											AG_T_R	Silver, Total Recoverable	ND(2.3)		mg/kg
											ZN_T_R	Zinc, Total Recoverable	92.4 J	J	mg/kg

APPENDIX B-8. SOLID-MATRIX ANALYTICAL RESULTS
COMBINATION MILL AOC
BLACK PINE MINE

Location	Sample ID	Field Sample ID	Lab Batch ID	Lab Sample ID	Date Sampled	Matrix	X	Y	Sample Start Depth	Sample End Depth	Tri Cas	Analyte	Value	Reviewer	Units
CML-SD-23	CML-SD-23 (2-3 ft)	CML-SD-23-02	10163437	10163437033	7/13/2011	Soil	988574.13	830539.22	2	3	MOISTURE	Soil Moisture	18.4		%
											SB_T_R	Antimony, Total Recoverable	38 J	J	mg/kg
											AS_T_R	Arsenic, Total Recoverable	48.4 J	J	mg/kg
											BA_T_R	Barium, Total Recoverable	218 J	J	mg/kg
											CD_T_R	Cadmium, Total Recoverable	3.1		mg/kg
											CR_T_R	Chromium, Total Recoverable	21.6		mg/kg
											CO_T_R	Cobalt, Total Recoverable	13		mg/kg
											CU_T_R	Copper, Total Recoverable	661 J	J	mg/kg
											FE_T_R	Iron, Total Recoverable	30800		mg/kg
											PB_T_R	Lead, Total Recoverable	300 J	J	mg/kg
											MN_T_R	Manganese, Total Recoverable	789		mg/kg
											HG_T_R	Mercury, Total Recoverable	2.9		mg/kg
											NI_T_R	Nickel, Total Recoverable	10.5		mg/kg
											AG_T_R	Silver, Total Recoverable	ND(2.2)		mg/kg
											ZN_T_R	Zinc, Total Recoverable	108 J	J	mg/kg
CML-SD-24	CML-SD-24 (0-0.5 ft)	CML-SD-24-00	10163437	10163437020	7/12/2011	Soil	988474.13	830539.22	0	0.5	MOISTURE	Soil Moisture	9.6		%
											SB_T_R	Antimony, Total Recoverable	95 J	J	mg/kg
											AS_T_R	Arsenic, Total Recoverable	109		mg/kg
											BA_T_R	Barium, Total Recoverable	371		mg/kg
											CD_T_R	Cadmium, Total Recoverable	6.5		mg/kg
											CR_T_R	Chromium, Total Recoverable	10		mg/kg
											CO_T_R	Cobalt, Total Recoverable	15.3		mg/kg
											CU_T_R	Copper, Total Recoverable	500		mg/kg
											FE_T_R	Iron, Total Recoverable	16500		mg/kg
											PB_T_R	Lead, Total Recoverable	617 J	J	mg/kg
											MN_T_R	Manganese, Total Recoverable	1190		mg/kg
											HG_T_R	Mercury, Total Recoverable	4.9		mg/kg
											NI_T_R	Nickel, Total Recoverable	10.4		mg/kg
											AG_T_R	Silver, Total Recoverable	7.3		mg/kg
											ZN_T_R	Zinc, Total Recoverable	269 J	J	mg/kg
CML-SD-24	CML-SD-24 (1-2 ft)	CML-SD-24-01	10163437	10163437021	7/12/2011	Soil	988474.13	830539.22	1	2	MOISTURE	Soil Moisture	22.6		%
											SB_T_R	Antimony, Total Recoverable	24 J	J	mg/kg
											AS_T_R	Arsenic, Total Recoverable	30.5 J	J	mg/kg
											BA_T_R	Barium, Total Recoverable	425 J	J	mg/kg
											CD_T_R	Cadmium, Total Recoverable	13.8		mg/kg
											CR_T_R	Chromium, Total Recoverable	16.3		mg/kg
											CO_T_R	Cobalt, Total Recoverable	25.8		mg/kg
											CU_T_R	Copper, Total Recoverable	1390 J	J	mg/kg
											FE_T_R	Iron, Total Recoverable	23200		mg/kg
											PB_T_R	Lead, Total Recoverable	182 J	J	mg/kg
											MN_T_R	Manganese, Total Recoverable	2050		mg/kg
											HG_T_R	Mercury, Total Recoverable	5.6		mg/kg
											NI_T_R	Nickel, Total Recoverable	22.5		mg/kg
											AG_T_R	Silver, Total Recoverable	ND(2.9)		mg/kg
											ZN_T_R	Zinc, Total Recoverable	328 J	J	mg/kg

APPENDIX B-8. SOLID-MATRIX ANALYTICAL RESULTS
COMBINATION MILL AOC
BLACK PINE MINE

Location	Sample ID	Field Sample ID	Lab Batch ID	Lab Sample ID	Date Sampled	Matrix	X	Y	Sample Start Depth	Sample End Depth	Tri Cas	Analyte	Value	Reviewer	Units
CML-SD-25	CML-SD-25 (0-0.5 ft)	CML-SD-25-00	10163437	10163437022	7/12/2011	Soil	988374.13	830539.22	0	0.5	MOISTURE	Soil Moisture	8.6		%
											SB_T_R	Antimony, Total Recoverable	184 J	J	mg/kg
											AS_T_R	Arsenic, Total Recoverable	232 J	J	mg/kg
											BA_T_R	Barium, Total Recoverable	515 J	J	mg/kg
											CD_T_R	Cadmium, Total Recoverable	12.6		mg/kg
											CR_T_R	Chromium, Total Recoverable	12.1		mg/kg
											CO_T_R	Cobalt, Total Recoverable	12.9		mg/kg
											CU_T_R	Copper, Total Recoverable	837 J	J	mg/kg
											FE_T_R	Iron, Total Recoverable	19900		mg/kg
											PB_T_R	Lead, Total Recoverable	1210 J	J	mg/kg
											MN_T_R	Manganese, Total Recoverable	1210		mg/kg
											HG_T_R	Mercury, Total Recoverable	3.5		mg/kg
											NI_T_R	Nickel, Total Recoverable	13.3		mg/kg
											AG_T_R	Silver, Total Recoverable	12.7		mg/kg
											ZN_T_R	Zinc, Total Recoverable	326 J	J	mg/kg
CML-SD-26	CML-SD-26 (0-0.5 ft)	CML-SD-26-00	10163437	10163437023	7/12/2011	Soil	988274.13	830539.22	0	0.5	MOISTURE	Soil Moisture	20.7		%
											SB_T_R	Antimony, Total Recoverable	312 J	J	mg/kg
											AS_T_R	Arsenic, Total Recoverable	291 J	J	mg/kg
											BA_T_R	Barium, Total Recoverable	185 J	J	mg/kg
											CD_T_R	Cadmium, Total Recoverable	12.3		mg/kg
											CR_T_R	Chromium, Total Recoverable	5		mg/kg
											CO_T_R	Cobalt, Total Recoverable	6.5		mg/kg
											CU_T_R	Copper, Total Recoverable	654 J	J	mg/kg
											FE_T_R	Iron, Total Recoverable	13600		mg/kg
											PB_T_R	Lead, Total Recoverable	1870 J	J	mg/kg
											MN_T_R	Manganese, Total Recoverable	598		mg/kg
											HG_T_R	Mercury, Total Recoverable	4.5		mg/kg
											NI_T_R	Nickel, Total Recoverable	ND(5.7)		mg/kg
											AG_T_R	Silver, Total Recoverable	22.7		mg/kg
											ZN_T_R	Zinc, Total Recoverable	235 J	J	mg/kg
CML-SD-27	CML-SD-27 (0-0.5 ft)	CML-SD-27-00	10163437	10163437019	7/12/2011	Soil	988474.13	830339.22	0	0.5	MOISTURE	Soil Moisture	7.3		%
											SB_T_R	Antimony, Total Recoverable	172 J	J	mg/kg
											AS_T_R	Arsenic, Total Recoverable	176		mg/kg
											BA_T_R	Barium, Total Recoverable	185		mg/kg
											CD_T_R	Cadmium, Total Recoverable	8		mg/kg
											CR_T_R	Chromium, Total Recoverable	6.6		mg/kg
											CO_T_R	Cobalt, Total Recoverable	8		mg/kg
											CU_T_R	Copper, Total Recoverable	1130		mg/kg
											FE_T_R	Iron, Total Recoverable	14100		mg/kg
											PB_T_R	Lead, Total Recoverable	1050 J	J	mg/kg
											MN_T_R	Manganese, Total Recoverable	790		mg/kg
											HG_T_R	Mercury, Total Recoverable	10.4		mg/kg
											NI_T_R	Nickel, Total Recoverable	6.2		mg/kg
											AG_T_R	Silver, Total Recoverable	14.2		mg/kg
											ZN_T_R	Zinc, Total Recoverable	175 J	J	mg/kg

APPENDIX B-8. SOLID-MATRIX ANALYTICAL RESULTS
COMBINATION MILL AOC
BLACK PINE MINE

Location	Sample ID	Field Sample ID	Lab Batch ID	Lab Sample ID	Date Sampled	Matrix	X	Y	Sample Start Depth	Sample End Depth	Tri Cas	Analyte	Value	Reviewer	Units
CML-SD-28	CML-SD-28 (0-0.5 ft)	CML-SD-28-00	10163437	10163437018	7/12/2011	Soil	988374.13	830339.22	0	0.5	MOISTURE	Soil Moisture	18		%
											SB_T_R	Antimony, Total Recoverable	248 J	J	mg/kg
											AS_T_R	Arsenic, Total Recoverable	265		mg/kg
											BA_T_R	Barium, Total Recoverable	647		mg/kg
											CD_T_R	Cadmium, Total Recoverable	15.9		mg/kg
											CR_T_R	Chromium, Total Recoverable	14.8		mg/kg
											CO_T_R	Cobalt, Total Recoverable	17.2		mg/kg
											CU_T_R	Copper, Total Recoverable	1690		mg/kg
											FE_T_R	Iron, Total Recoverable	23500		mg/kg
											PB_T_R	Lead, Total Recoverable	1440 J	J	mg/kg
											MN_T_R	Manganese, Total Recoverable	1070		mg/kg
											HG_T_R	Mercury, Total Recoverable	22.1		mg/kg
											NI_T_R	Nickel, Total Recoverable	18.3		mg/kg
											AG_T_R	Silver, Total Recoverable	14.7		mg/kg
											ZN_T_R	Zinc, Total Recoverable	343 J	J	mg/kg
CML-SD-29	CML-SD-29 (0-0.5 ft)	CML-SD-29-00	10163437	10163437017	7/12/2011	Soil	988274.13	830339.22	0	0.5	MOISTURE	Soil Moisture	6		%
											SB_T_R	Antimony, Total Recoverable	706 J	J	mg/kg
											AS_T_R	Arsenic, Total Recoverable	630		mg/kg
											BA_T_R	Barium, Total Recoverable	359		mg/kg
											CD_T_R	Cadmium, Total Recoverable	27.6		mg/kg
											CR_T_R	Chromium, Total Recoverable	3.7		mg/kg
											CO_T_R	Cobalt, Total Recoverable	3.1		mg/kg
											CU_T_R	Copper, Total Recoverable	2060		mg/kg
											FE_T_R	Iron, Total Recoverable	17300		mg/kg
											PB_T_R	Lead, Total Recoverable	3890 J	J	mg/kg
											MN_T_R	Manganese, Total Recoverable	352		mg/kg
											HG_T_R	Mercury, Total Recoverable	4.1		mg/kg
											NI_T_R	Nickel, Total Recoverable	ND(4.9)		mg/kg
											AG_T_R	Silver, Total Recoverable	58.1		mg/kg
											ZN_T_R	Zinc, Total Recoverable	359 J	J	mg/kg
CML-SD-30	CML-SD-30 (0-0.5 ft)	CML-SD-30-00	10163437	10163437030	7/13/2011	Soil	988415.52	830223.41	0	0.5	MOISTURE	Soil Moisture	23.7		%
											SB_T_R	Antimony, Total Recoverable	5.6 J	J	mg/kg
											AS_T_R	Arsenic, Total Recoverable	24.9 J	J	mg/kg
											BA_T_R	Barium, Total Recoverable	294 J	J	mg/kg
											CD_T_R	Cadmium, Total Recoverable	6.6		mg/kg
											CR_T_R	Chromium, Total Recoverable	15.1		mg/kg
											CO_T_R	Cobalt, Total Recoverable	23.7		mg/kg
											CU_T_R	Copper, Total Recoverable	1550 J	J	mg/kg
											FE_T_R	Iron, Total Recoverable	26500		mg/kg
											PB_T_R	Lead, Total Recoverable	81.8 J	J	mg/kg
											MN_T_R	Manganese, Total Recoverable	974		mg/kg
											HG_T_R	Mercury, Total Recoverable	9.6		mg/kg
											NI_T_R	Nickel, Total Recoverable	12.9		mg/kg
											AG_T_R	Silver, Total Recoverable	ND(2.5)		mg/kg
											ZN_T_R	Zinc, Total Recoverable	232 J	J	mg/kg

APPENDIX B-8. SOLID-MATRIX ANALYTICAL RESULTS
COMBINATION MILL AOC
BLACK PINE MINE

Location	Sample ID	Field Sample ID	Lab Batch ID	Lab Sample ID	Date Sampled	Matrix	X	Y	Sample Start Depth	Sample End Depth	Tri Cas	Analyte	Value	Reviewer	Units
CML-SD-31	CML-SD-31 (0-0.5 ft)	CML-SD-31-00	10163437	10163437015	7/12/2011	Soil	988274.13	830139.22	0	0.5	MOISTURE	Soil Moisture	14.2		%
											SB_T_R	Antimony, Total Recoverable	272 J	J	mg/kg
											AS_T_R	Arsenic, Total Recoverable	301		mg/kg
											BA_T_R	Barium, Total Recoverable	451		mg/kg
											CD_T_R	Cadmium, Total Recoverable	13.5		mg/kg
											CR_T_R	Chromium, Total Recoverable	11.7		mg/kg
											CO_T_R	Cobalt, Total Recoverable	15.5		mg/kg
											CU_T_R	Copper, Total Recoverable	2950		mg/kg
											FE_T_R	Iron, Total Recoverable	22600		mg/kg
											PB_T_R	Lead, Total Recoverable	1350 J	J	mg/kg
											MN_T_R	Manganese, Total Recoverable	1040		mg/kg
											HG_T_R	Mercury, Total Recoverable	2.1		mg/kg
											NI_T_R	Nickel, Total Recoverable	9.5		mg/kg
											AG_T_R	Silver, Total Recoverable	19.3		mg/kg
											ZN_T_R	Zinc, Total Recoverable	370 J	J	mg/kg
CML-SD-31	CML-SD-31 (2-3 ft)	CML-SD-31-02	10163437	10163437016	7/12/2011	Soil	988274.13	830139.22	2	3	MOISTURE	Soil Moisture	22.2		%
											SB_T_R	Antimony, Total Recoverable	406 J	J	mg/kg
											AS_T_R	Arsenic, Total Recoverable	382		mg/kg
											BA_T_R	Barium, Total Recoverable	296		mg/kg
											CD_T_R	Cadmium, Total Recoverable	17.9		mg/kg
											CR_T_R	Chromium, Total Recoverable	8.3		mg/kg
											CO_T_R	Cobalt, Total Recoverable	18.8		mg/kg
											CU_T_R	Copper, Total Recoverable	1950		mg/kg
											FE_T_R	Iron, Total Recoverable	18900		mg/kg
											PB_T_R	Lead, Total Recoverable	2350 J	J	mg/kg
											MN_T_R	Manganese, Total Recoverable	1190		mg/kg
											HG_T_R	Mercury, Total Recoverable	3.8		mg/kg
											NI_T_R	Nickel, Total Recoverable	10.4		mg/kg
											AG_T_R	Silver, Total Recoverable	39.2		mg/kg
											ZN_T_R	Zinc, Total Recoverable	246 J	J	mg/kg
CML-SD-32	CML-SD-32 (0-0.5 ft)	CML-SD-32-00	10163437	10163437014	7/12/2011	Soil	988274.13	829939.22	0	0.5	MOISTURE	Soil Moisture	29.7		%
											SB_T_R	Antimony, Total Recoverable	463 J	J	mg/kg
											AS_T_R	Arsenic, Total Recoverable	449		mg/kg
											BA_T_R	Barium, Total Recoverable	421		mg/kg
											CD_T_R	Cadmium, Total Recoverable	16		mg/kg
											CR_T_R	Chromium, Total Recoverable	7.9		mg/kg
											CO_T_R	Cobalt, Total Recoverable	5.2		mg/kg
											CU_T_R	Copper, Total Recoverable	921		mg/kg
											FE_T_R	Iron, Total Recoverable	19300		mg/kg
											PB_T_R	Lead, Total Recoverable	2470 J	J	mg/kg
											MN_T_R	Manganese, Total Recoverable	558		mg/kg
											HG_T_R	Mercury, Total Recoverable	10.9		mg/kg
											NI_T_R	Nickel, Total Recoverable	7.2		mg/kg
											AG_T_R	Silver, Total Recoverable	21.6		mg/kg
											ZN_T_R	Zinc, Total Recoverable	387 J	J	mg/kg

APPENDIX B-8. SOLID-MATRIX ANALYTICAL RESULTS
COMBINATION MILL AOC
BLACK PINE MINE

Location	Sample ID	Field Sample ID	Lab Batch ID	Lab Sample ID	Date Sampled	Matrix	X	Y	Sample Start Depth	Sample End Depth	Tri Cas	Analyte	Value	Reviewer	Units
CML-SD-33	CML-SD-33 (0-0.5 ft)	CML-SD-33-00	10163437	10163437012	7/12/2011	Soil	988274.13	829739.22	0	0.5	MOISTURE	Soil Moisture	15.9		%
											SB_T_R	Antimony, Total Recoverable	159 J	J	mg/kg
											AS_T_R	Arsenic, Total Recoverable	155		mg/kg
											BA_T_R	Barium, Total Recoverable	448		mg/kg
											CD_T_R	Cadmium, Total Recoverable	9		mg/kg
											CR_T_R	Chromium, Total Recoverable	11.4		mg/kg
											CO_T_R	Cobalt, Total Recoverable	3.5		mg/kg
											CU_T_R	Copper, Total Recoverable	1260		mg/kg
											FE_T_R	Iron, Total Recoverable	13400		mg/kg
											PB_T_R	Lead, Total Recoverable	925 J	J	mg/kg
											MN_T_R	Manganese, Total Recoverable	127		mg/kg
											HG_T_R	Mercury, Total Recoverable	4.3		mg/kg
											NI_T_R	Nickel, Total Recoverable	7.2		mg/kg
											AG_T_R	Silver, Total Recoverable	11.1		mg/kg
											ZN_T_R	Zinc, Total Recoverable	200 J	J	mg/kg
CML-SD-33	CML-SD-33 (1-2 ft)	CML-SD-33-01	10163437	10163437013	7/12/2011	Soil	988274.13	829739.22	1	2	MOISTURE	Soil Moisture	10.1		%
											SB_T_R	Antimony, Total Recoverable	511 J	J	mg/kg
											AS_T_R	Arsenic, Total Recoverable	527		mg/kg
											BA_T_R	Barium, Total Recoverable	210		mg/kg
											CD_T_R	Cadmium, Total Recoverable	20.6		mg/kg
											CR_T_R	Chromium, Total Recoverable	3.1		mg/kg
											CO_T_R	Cobalt, Total Recoverable	ND(2.3)		mg/kg
											CU_T_R	Copper, Total Recoverable	1420		mg/kg
											FE_T_R	Iron, Total Recoverable	14200		mg/kg
											PB_T_R	Lead, Total Recoverable	2940 J	J	mg/kg
											MN_T_R	Manganese, Total Recoverable	163		mg/kg
											HG_T_R	Mercury, Total Recoverable	1.1		mg/kg
											NI_T_R	Nickel, Total Recoverable	ND(4.7)		mg/kg
											AG_T_R	Silver, Total Recoverable	46.6		mg/kg
											ZN_T_R	Zinc, Total Recoverable	260 J	J	mg/kg
CML-SD-34	CML-SD-34 (0-0.5 ft)	CML-SD-34	10163437	10163437006	7/12/2011	Soil	988274.13	829539.22	0	0.5	MOISTURE	Soil Moisture	62.7		%
											SB_T_R	Antimony, Total Recoverable	683 J	J	mg/kg
											AS_T_R	Arsenic, Total Recoverable	315		mg/kg
											BA_T_R	Barium, Total Recoverable	269		mg/kg
											CD_T_R	Cadmium, Total Recoverable	15.6		mg/kg
											CR_T_R	Chromium, Total Recoverable	13.6		mg/kg
											CO_T_R	Cobalt, Total Recoverable	6.9		mg/kg
											CU_T_R	Copper, Total Recoverable	2240		mg/kg
											FE_T_R	Iron, Total Recoverable	18800		mg/kg
											PB_T_R	Lead, Total Recoverable	2840 J	J	mg/kg
											MN_T_R	Manganese, Total Recoverable	165		mg/kg
											HG_T_R	Mercury, Total Recoverable	55.4		mg/kg
											NI_T_R	Nickel, Total Recoverable	ND(11.9)		mg/kg
											AG_T_R	Silver, Total Recoverable	29.6		mg/kg
											ZN_T_R	Zinc, Total Recoverable	333 J	J	mg/kg

APPENDIX B-8. SOLID-MATRIX ANALYTICAL RESULTS
COMBINATION MILL AOC
BLACK PINE MINE

Location	Sample ID	Field Sample ID	Lab Batch ID	Lab Sample ID	Date Sampled	Matrix	X	Y	Sample Start Depth	Sample End Depth	Tri Cas	Analyte	Value	Reviewer	Units
CML-SD-35	CML-SD-35 (0-0.5 ft)	CML-SD-35	10163437	10163437007	7/12/2011	Soil	988174.13	829538.22	0	0.5	MOISTURE	Soil Moisture	27		%
											SB_T_R	Antimony, Total Recoverable	293 J	J	mg/kg
											AS_T_R	Arsenic, Total Recoverable	305		mg/kg
											BA_T_R	Barium, Total Recoverable	271		mg/kg
											CD_T_R	Cadmium, Total Recoverable	12.9		mg/kg
											CR_T_R	Chromium, Total Recoverable	9.8		mg/kg
											CO_T_R	Cobalt, Total Recoverable	5.4		mg/kg
											CU_T_R	Copper, Total Recoverable	1740		mg/kg
											FE_T_R	Iron, Total Recoverable	22100		mg/kg
											PB_T_R	Lead, Total Recoverable	2200 J	J	mg/kg
											MN_T_R	Manganese, Total Recoverable	666		mg/kg
											HG_T_R	Mercury, Total Recoverable	57.9		mg/kg
											NI_T_R	Nickel, Total Recoverable	7.5		mg/kg
											AG_T_R	Silver, Total Recoverable	31.3		mg/kg
											ZN_T_R	Zinc, Total Recoverable	344 J	J	mg/kg
CML-SD-36	CML-SD-36 (0-0.5 ft)	CML-SD-36	10163437	10163437005	7/12/2011	Soil	988374.13	829339.22	0	0.5	MOISTURE	Soil Moisture	20.5		%
											SB_T_R	Antimony, Total Recoverable	105 J	J	mg/kg
											AS_T_R	Arsenic, Total Recoverable	125		mg/kg
											BA_T_R	Barium, Total Recoverable	259		mg/kg
											CD_T_R	Cadmium, Total Recoverable	6.2		mg/kg
											CR_T_R	Chromium, Total Recoverable	5.5		mg/kg
											CO_T_R	Cobalt, Total Recoverable	4.2		mg/kg
											CU_T_R	Copper, Total Recoverable	479		mg/kg
											FE_T_R	Iron, Total Recoverable	9620		mg/kg
											PB_T_R	Lead, Total Recoverable	769 J	J	mg/kg
											MN_T_R	Manganese, Total Recoverable	788		mg/kg
											HG_T_R	Mercury, Total Recoverable	9.3		mg/kg
											NI_T_R	Nickel, Total Recoverable	6.5		mg/kg
											AG_T_R	Silver, Total Recoverable	18.8		mg/kg
											ZN_T_R	Zinc, Total Recoverable	107 J	J	mg/kg
CML-SD-37	CML-SD-37 (0-0.5 ft)	CML-SD-37	10163437	10163437004	7/12/2011	Soil	988274.13	829339.22	0	0.5	MOISTURE	Soil Moisture	3.8		%
											SB_T_R	Antimony, Total Recoverable	88.9 J	J	mg/kg
											AS_T_R	Arsenic, Total Recoverable	118		mg/kg
											BA_T_R	Barium, Total Recoverable	249		mg/kg
											CD_T_R	Cadmium, Total Recoverable	4.4		mg/kg
											CR_T_R	Chromium, Total Recoverable	25.8		mg/kg
											CO_T_R	Cobalt, Total Recoverable	9.9		mg/kg
											CU_T_R	Copper, Total Recoverable	276		mg/kg
											FE_T_R	Iron, Total Recoverable	36900		mg/kg
											PB_T_R	Lead, Total Recoverable	693 J	J	mg/kg
											MN_T_R	Manganese, Total Recoverable	569		mg/kg
											HG_T_R	Mercury, Total Recoverable	8.1		mg/kg
											NI_T_R	Nickel, Total Recoverable	4.7		mg/kg
											AG_T_R	Silver, Total Recoverable	10.8		mg/kg
											ZN_T_R	Zinc, Total Recoverable	164 J	J	mg/kg

APPENDIX B-8. SOLID-MATRIX ANALYTICAL RESULTS
COMBINATION MILL AOC
BLACK PINE MINE

Location	Sample ID	Field Sample ID	Lab Batch ID	Lab Sample ID	Date Sampled	Matrix	X	Y	Sample Start Depth	Sample End Depth	Tri Cas	Analyte	Value	Reviewer	Units
CML-SD-38	CML-SD-38 (0-0.5 ft)	CML-SD-38	10163437	10163437008	7/12/2011	Soil	988174.13	829337.61	0	0.5	MOISTURE	Soil Moisture	15.8		%
											SB_T_R	Antimony, Total Recoverable	69.3 J	J	mg/kg
											AS_T_R	Arsenic, Total Recoverable	101		mg/kg
											BA_T_R	Barium, Total Recoverable	284		mg/kg
											CD_T_R	Cadmium, Total Recoverable	4.4		mg/kg
											CR_T_R	Chromium, Total Recoverable	10.3		mg/kg
											CO_T_R	Cobalt, Total Recoverable	6.2		mg/kg
											CU_T_R	Copper, Total Recoverable	375		mg/kg
											FE_T_R	Iron, Total Recoverable	16400		mg/kg
											PB_T_R	Lead, Total Recoverable	518 J	J	mg/kg
											MN_T_R	Manganese, Total Recoverable	1300		mg/kg
											HG_T_R	Mercury, Total Recoverable	9.7		mg/kg
											NI_T_R	Nickel, Total Recoverable	7.1		mg/kg
											AG_T_R	Silver, Total Recoverable	8.3		mg/kg
											ZN_T_R	Zinc, Total Recoverable	134 J	J	mg/kg
CML-SD-39	CML-SD-39 (0-0.5 ft)	CML-SD-39-00	10163437	10163437029	7/13/2011	Soil	988374.13	829139.22	0	0.5	MOISTURE	Soil Moisture	18.1		%
											SB_T_R	Antimony, Total Recoverable	23 J	J	mg/kg
											AS_T_R	Arsenic, Total Recoverable	27.2 J	J	mg/kg
											BA_T_R	Barium, Total Recoverable	414 J	J	mg/kg
											CD_T_R	Cadmium, Total Recoverable	2.2		mg/kg
											CR_T_R	Chromium, Total Recoverable	10.2		mg/kg
											CO_T_R	Cobalt, Total Recoverable	6.6		mg/kg
											CU_T_R	Copper, Total Recoverable	180 J	J	mg/kg
											FE_T_R	Iron, Total Recoverable	11900		mg/kg
											PB_T_R	Lead, Total Recoverable	238 J	J	mg/kg
											MN_T_R	Manganese, Total Recoverable	415		mg/kg
											HG_T_R	Mercury, Total Recoverable	5.3		mg/kg
											NI_T_R	Nickel, Total Recoverable	12.1		mg/kg
											AG_T_R	Silver, Total Recoverable	ND(2.2)		mg/kg
											ZN_T_R	Zinc, Total Recoverable	101 J	J	mg/kg
CML-SD-40	CML-SD-40 (0-0.5 ft)	CML-SD-40	10163437	10163437003	7/12/2011	Soil	988274.13	829139.22	0	0.5	MOISTURE	Soil Moisture	44.3		%
											SB_T_R	Antimony, Total Recoverable	11.1 J	J	mg/kg
											AS_T_R	Arsenic, Total Recoverable	16.5		mg/kg
											BA_T_R	Barium, Total Recoverable	437		mg/kg
											CD_T_R	Cadmium, Total Recoverable	1.6		mg/kg
											CR_T_R	Chromium, Total Recoverable	10.3		mg/kg
											CO_T_R	Cobalt, Total Recoverable	7.6		mg/kg
											CU_T_R	Copper, Total Recoverable	75.5		mg/kg
											FE_T_R	Iron, Total Recoverable	11300		mg/kg
											PB_T_R	Lead, Total Recoverable	88 J	J	mg/kg
											MN_T_R	Manganese, Total Recoverable	781		mg/kg
											HG_T_R	Mercury, Total Recoverable	2.1		mg/kg
											NI_T_R	Nickel, Total Recoverable	13.9		mg/kg
											AG_T_R	Silver, Total Recoverable	ND(3)		mg/kg
											ZN_T_R	Zinc, Total Recoverable	127 J	J	mg/kg

APPENDIX B-8. SOLID-MATRIX ANALYTICAL RESULTS
COMBINATION MILL AOC
BLACK PINE MINE

Location	Sample ID	Field Sample ID	Lab Batch ID	Lab Sample ID	Date Sampled	Matrix	X	Y	Sample Start Depth	Sample End Depth	Tri Cas	Analyte	Value	Reviewer	Units
CML-SD-41	CML-SD-41 (0-0.5 ft)	CML-SD-41	10163437	10163437009	7/12/2011	Soil	988174.13	829139.22	0	0.5	MOISTURE	Soil Moisture	9.3		%
											SB_T_R	Antimony, Total Recoverable	239 J	J	mg/kg
											AS_T_R	Arsenic, Total Recoverable	270		mg/kg
											BA_T_R	Barium, Total Recoverable	191		mg/kg
											CD_T_R	Cadmium, Total Recoverable	13.1		mg/kg
											CR_T_R	Chromium, Total Recoverable	8.9		mg/kg
											CO_T_R	Cobalt, Total Recoverable	3.4		mg/kg
											CU_T_R	Copper, Total Recoverable	653		mg/kg
											FE_T_R	Iron, Total Recoverable	24900		mg/kg
											PB_T_R	Lead, Total Recoverable	1570 J	J	mg/kg
											MN_T_R	Manganese, Total Recoverable	485		mg/kg
											HG_T_R	Mercury, Total Recoverable	5.4		mg/kg
											NI_T_R	Nickel, Total Recoverable	ND(5)		mg/kg
											AG_T_R	Silver, Total Recoverable	46.3		mg/kg
											ZN_T_R	Zinc, Total Recoverable	170 J	J	mg/kg
CML-SD-42	CML-SD-42 (0-0.5 ft)	CML-SD-42-00	10163437	10163437027	7/13/2011	Soil	988374.13	828939.22	0	0.5	MOISTURE	Soil Moisture	15		%
											SB_T_R	Antimony, Total Recoverable	26.2 J	J	mg/kg
											AS_T_R	Arsenic, Total Recoverable	37.4 J	J	mg/kg
											BA_T_R	Barium, Total Recoverable	63.2 J	J	mg/kg
											CD_T_R	Cadmium, Total Recoverable	1.1		mg/kg
											CR_T_R	Chromium, Total Recoverable	9.5		mg/kg
											CO_T_R	Cobalt, Total Recoverable	3.5		mg/kg
											CU_T_R	Copper, Total Recoverable	123 J	J	mg/kg
											FE_T_R	Iron, Total Recoverable	14800		mg/kg
											PB_T_R	Lead, Total Recoverable	174 J	J	mg/kg
											MN_T_R	Manganese, Total Recoverable	88.4		mg/kg
											HG_T_R	Mercury, Total Recoverable	3.9		mg/kg
											NI_T_R	Nickel, Total Recoverable	ND(4.4)		mg/kg
											AG_T_R	Silver, Total Recoverable	ND(2.2)		mg/kg
											ZN_T_R	Zinc, Total Recoverable	32.6 J	J	mg/kg
CML-SD-42	CML-SD-42 (2-3 ft)	CML-SD-42-02	10163437	10163437028	7/13/2011	Soil	988374.13	828939.22	2	3	MOISTURE	Soil Moisture	16.6		%
											SB_T_R	Antimony, Total Recoverable	40.5 J	J	mg/kg
											AS_T_R	Arsenic, Total Recoverable	48.7 J	J	mg/kg
											BA_T_R	Barium, Total Recoverable	171 J	J	mg/kg
											CD_T_R	Cadmium, Total Recoverable	2.4		mg/kg
											CR_T_R	Chromium, Total Recoverable	11.6		mg/kg
											CO_T_R	Cobalt, Total Recoverable	5.7		mg/kg
											CU_T_R	Copper, Total Recoverable	309 J	J	mg/kg
											FE_T_R	Iron, Total Recoverable	15400		mg/kg
											PB_T_R	Lead, Total Recoverable	240 J	J	mg/kg
											MN_T_R	Manganese, Total Recoverable	323		mg/kg
											HG_T_R	Mercury, Total Recoverable	5		mg/kg
											NI_T_R	Nickel, Total Recoverable	9		mg/kg
											AG_T_R	Silver, Total Recoverable	2.7		mg/kg
											ZN_T_R	Zinc, Total Recoverable	71.9 J	J	mg/kg

APPENDIX B-8. SOLID-MATRIX ANALYTICAL RESULTS
COMBINATION MILL AOC
BLACK PINE MINE

Location	Sample ID	Field Sample ID	Lab Batch ID	Lab Sample ID	Date Sampled	Matrix	X	Y	Sample Start Depth	Sample End Depth	Tri Cas	Analyte	Value	Reviewer	Units
CML-SD-43	CML-SD-43 (0-0.5 ft)	CML-SD-43	10163437	10163437002	7/12/2011	Soil	988274.13	828939.22	0	0.5	MOISTURE	Soil Moisture	30.5		%
											SB_T_R	Antimony, Total Recoverable	20 J	J	mg/kg
											AS_T_R	Arsenic, Total Recoverable	32.9		mg/kg
											BA_T_R	Barium, Total Recoverable	485		mg/kg
											CD_T_R	Cadmium, Total Recoverable	4.2		mg/kg
											CR_T_R	Chromium, Total Recoverable	10.9		mg/kg
											CO_T_R	Cobalt, Total Recoverable	8.3		mg/kg
											CU_T_R	Copper, Total Recoverable	131		mg/kg
											FE_T_R	Iron, Total Recoverable	13100		mg/kg
											PB_T_R	Lead, Total Recoverable	136 J	J	mg/kg
											MN_T_R	Manganese, Total Recoverable	936		mg/kg
											HG_T_R	Mercury, Total Recoverable	3.3		mg/kg
											NI_T_R	Nickel, Total Recoverable	12.7		mg/kg
											AG_T_R	Silver, Total Recoverable	ND(3.1)		mg/kg
											ZN_T_R	Zinc, Total Recoverable	211 J	J	mg/kg
CML-SD-44	CML-SD-44 (0-0.5 ft)	CML-SD-44	10163437	10163437010	7/12/2011	Soil	988174.13	828939.22	0	0.5	MOISTURE	Soil Moisture	38.4		%
											SB_T_R	Antimony, Total Recoverable	7.9 J	J	mg/kg
											AS_T_R	Arsenic, Total Recoverable	29.5		mg/kg
											BA_T_R	Barium, Total Recoverable	437		mg/kg
											CD_T_R	Cadmium, Total Recoverable	1.3		mg/kg
											CR_T_R	Chromium, Total Recoverable	23.9		mg/kg
											CO_T_R	Cobalt, Total Recoverable	7.8		mg/kg
											CU_T_R	Copper, Total Recoverable	97.9		mg/kg
											FE_T_R	Iron, Total Recoverable	37400		mg/kg
											PB_T_R	Lead, Total Recoverable	168 J	J	mg/kg
											MN_T_R	Manganese, Total Recoverable	160		mg/kg
											HG_T_R	Mercury, Total Recoverable	6.9		mg/kg
											NI_T_R	Nickel, Total Recoverable	19.2		mg/kg
											AG_T_R	Silver, Total Recoverable	ND(3.3)		mg/kg
											ZN_T_R	Zinc, Total Recoverable	202 J	J	mg/kg
CML-SD-45	CML-SD-45 (0-0.5 ft)	CML-SD-45	10163437	10163437001	7/12/2011	Soil	988274.13	828739.22	0	0.5	MOISTURE	Soil Moisture	25.4		%
											SB_T_R	Antimony, Total Recoverable	2.8 J	J	mg/kg
											AS_T_R	Arsenic, Total Recoverable	7.8		mg/kg
											BA_T_R	Barium, Total Recoverable	285		mg/kg
											CD_T_R	Cadmium, Total Recoverable	1.1		mg/kg
											CR_T_R	Chromium, Total Recoverable	8.4		mg/kg
											CO_T_R	Cobalt, Total Recoverable	7.7		mg/kg
											CU_T_R	Copper, Total Recoverable	42.5		mg/kg
											FE_T_R	Iron, Total Recoverable	9690		mg/kg
											PB_T_R	Lead, Total Recoverable	37.5 J	J	mg/kg
											MN_T_R	Manganese, Total Recoverable	739		mg/kg
											HG_T_R	Mercury, Total Recoverable	1.1		mg/kg
											NI_T_R	Nickel, Total Recoverable	11		mg/kg
											AG_T_R	Silver, Total Recoverable	ND(2.5)		mg/kg
											ZN_T_R	Zinc, Total Recoverable	78.3 J	J	mg/kg

APPENDIX B-8. SOLID-MATRIX ANALYTICAL RESULTS
COMBINATION MILL AOC
BLACK PINE MINE

Location	Sample ID	Field Sample ID	Lab Batch ID	Lab Sample ID	Date Sampled	Matrix	X	Y	Sample Start Depth	Sample End Depth	Tri Cas	Analyte	Value	Reviewer	Units
CML-SD-46	CML-SD-46 (0-0.5 ft)	CML-SD-46	10163437	10163437011	7/12/2011	Soil	988174.13	828739.22	0	0.5	MOISTURE	Soil Moisture	60.7		%
											SB_T_R	Antimony, Total Recoverable	8 J	J	mg/kg
											AS_T_R	Arsenic, Total Recoverable	10.5		mg/kg
											BA_T_R	Barium, Total Recoverable	489		mg/kg
											CD_T_R	Cadmium, Total Recoverable	1.5		mg/kg
											CR_T_R	Chromium, Total Recoverable	24.2		mg/kg
											CO_T_R	Cobalt, Total Recoverable	6.4		mg/kg
											CU_T_R	Copper, Total Recoverable	68.9		mg/kg
											FE_T_R	Iron, Total Recoverable	25900		mg/kg
											PB_T_R	Lead, Total Recoverable	55 J	J	mg/kg
											MN_T_R	Manganese, Total Recoverable	183		mg/kg
											HG_T_R	Mercury, Total Recoverable	12.7		mg/kg
											NI_T_R	Nickel, Total Recoverable	25.4		mg/kg
											AG_T_R	Silver, Total Recoverable	ND(4.9)		mg/kg
											ZN_T_R	Zinc, Total Recoverable	227 J	J	mg/kg
CML-SS-01	CML-SS-01 (6-7 ft)	BP-CML-SS-01-06	10163645	10163645008	7/15/2011	Soil	988616.41	830303.97	6	7	MOISTURE	Soil Moisture	37.2		%
											SB_T_R	Antimony, Total Recoverable	167		mg/kg
											AS_T_R	Arsenic, Total Recoverable	123		mg/kg
											BA_T_R	Barium, Total Recoverable	229		mg/kg
											CD_T_R	Cadmium, Total Recoverable	8.3		mg/kg
											CR_T_R	Chromium, Total Recoverable	5.7		mg/kg
											CO_T_R	Cobalt, Total Recoverable	15.3		mg/kg
											CU_T_R	Copper, Total Recoverable	2570		mg/kg
											FE_T_R	Iron, Total Recoverable	12800		mg/kg
											PB_T_R	Lead, Total Recoverable	1120		mg/kg
											MN_T_R	Manganese, Total Recoverable	1300		mg/kg
											HG_T_R	Mercury, Total Recoverable	0.35 J	J	mg/kg
											NI_T_R	Nickel, Total Recoverable	6.8		mg/kg
											AG_T_R	Silver, Total Recoverable	14.1		mg/kg
											ZN_T_R	Zinc, Total Recoverable	163		mg/kg
CML-SS-02	CML-SS-02 (6-7 ft)	BP-CML-SS-02-06	10163645	10163645011	7/15/2011	Soil	988486.50	830048.85	6	7	MOISTURE	Soil Moisture	17.9		%
											SB_T_R	Antimony, Total Recoverable	10		mg/kg
											AS_T_R	Arsenic, Total Recoverable	11.9		mg/kg
											BA_T_R	Barium, Total Recoverable	178		mg/kg
											CD_T_R	Cadmium, Total Recoverable	3.1		mg/kg
											CR_T_R	Chromium, Total Recoverable	6.1		mg/kg
											CO_T_R	Cobalt, Total Recoverable	2.1		mg/kg
											CU_T_R	Copper, Total Recoverable	2360		mg/kg
											FE_T_R	Iron, Total Recoverable	5640		mg/kg
											PB_T_R	Lead, Total Recoverable	67.7		mg/kg
											MN_T_R	Manganese, Total Recoverable	67.2		mg/kg
											HG_T_R	Mercury, Total Recoverable	9.1		mg/kg
											NI_T_R	Nickel, Total Recoverable	5.3		mg/kg
											AG_T_R	Silver, Total Recoverable	1		mg/kg
											ZN_T_R	Zinc, Total Recoverable	108		mg/kg

APPENDIX B-8. SOLID-MATRIX ANALYTICAL RESULTS
COMBINATION MILL AOC
BLACK PINE MINE

Location	Sample ID	Field Sample ID	Lab Batch ID	Lab Sample ID	Date Sampled	Matrix	X	Y	Sample Start Depth	Sample End Depth	Tri Cas	Analyte	Value	Reviewer	Units
CML-SS-03	CML-SS-03 (6-7 ft)	BP-CML-SS-03-06	10163645	10163645014	7/15/2011	Soil	988666.65	829989.19	6	7	MOISTURE	Soil Moisture	28.9		%
											SB_T_R	Antimony, Total Recoverable	750		mg/kg
											AS_T_R	Arsenic, Total Recoverable	777		mg/kg
											BA_T_R	Barium, Total Recoverable	370		mg/kg
											CD_T_R	Cadmium, Total Recoverable	15		mg/kg
											CR_T_R	Chromium, Total Recoverable	ND(0.5)		mg/kg
											CO_T_R	Cobalt, Total Recoverable	2.5		mg/kg
											CU_T_R	Copper, Total Recoverable	3840		mg/kg
											FE_T_R	Iron, Total Recoverable	16200		mg/kg
											PB_T_R	Lead, Total Recoverable	5310		mg/kg
											MN_T_R	Manganese, Total Recoverable	136		mg/kg
											HG_T_R	Mercury, Total Recoverable	12.6		mg/kg
											NI_T_R	Nickel, Total Recoverable	4.1		mg/kg
											AG_T_R	Silver, Total Recoverable	70.8		mg/kg
											ZN_T_R	Zinc, Total Recoverable	384		mg/kg
CML-SS-04	CML-SS-04 (6-8 ft)	BP-CML-SS-04-06	10163640	10163640003	7/15/2011	Soil	988406.32	829694.92	6	8	MOISTURE	Soil Moisture	24.6		%
											SB_T_R	Antimony, Total Recoverable	164		mg/kg
											AS_T_R	Arsenic, Total Recoverable	121		mg/kg
											BA_T_R	Barium, Total Recoverable	286		mg/kg
											CD_T_R	Cadmium, Total Recoverable	9.6		mg/kg
											CR_T_R	Chromium, Total Recoverable	9.5		mg/kg
											CO_T_R	Cobalt, Total Recoverable	11.4 J	J	mg/kg
											CU_T_R	Copper, Total Recoverable	1230		mg/kg
											FE_T_R	Iron, Total Recoverable	10700		mg/kg
											PB_T_R	Lead, Total Recoverable	393		mg/kg
											MN_T_R	Manganese, Total Recoverable	359		mg/kg
											HG_T_R	Mercury, Total Recoverable	81.1 J	J	mg/kg
											NI_T_R	Nickel, Total Recoverable	9.2		mg/kg
											AG_T_R	Silver, Total Recoverable	10.1		mg/kg
											ZN_T_R	Zinc, Total Recoverable	208		mg/kg
CML-SS-05	CML-SS-05 (4-6 ft)	BP-CML-SS-05-04	10163640	10163640006	7/15/2011	Soil	988516.20	829612.88	4	6	MOISTURE	Soil Moisture	36.7		%
											SB_T_R	Antimony, Total Recoverable	1260		mg/kg
											AS_T_R	Arsenic, Total Recoverable	1030		mg/kg
											BA_T_R	Barium, Total Recoverable	495		mg/kg
											CD_T_R	Cadmium, Total Recoverable	23.1		mg/kg
											CR_T_R	Chromium, Total Recoverable	4.8		mg/kg
											CO_T_R	Cobalt, Total Recoverable	1.3 J	J	mg/kg
											CU_T_R	Copper, Total Recoverable	5600		mg/kg
											FE_T_R	Iron, Total Recoverable	18900		mg/kg
											PB_T_R	Lead, Total Recoverable	8010		mg/kg
											MN_T_R	Manganese, Total Recoverable	155		mg/kg
											HG_T_R	Mercury, Total Recoverable	24.7 J	J	mg/kg
											NI_T_R	Nickel, Total Recoverable	3		mg/kg
											AG_T_R	Silver, Total Recoverable	101		mg/kg
											ZN_T_R	Zinc, Total Recoverable	371		mg/kg

APPENDIX B-8. SOLID-MATRIX ANALYTICAL RESULTS
COMBINATION MILL AOC
BLACK PINE MINE

Location	Sample ID	Field Sample ID	Lab Batch ID	Lab Sample ID	Date Sampled	Matrix	X	Y	Sample Start Depth	Sample End Depth	Tri Cas	Analyte	Value	Reviewer	Units
CML-SS-06	CML-SS-06 (5-7 ft)	BP-CML-SS-06-05	10163640	10163640009	7/15/2011	Soil	988459.01	829346.48	5	7	MOISTURE	Soil Moisture	42.4		%
											SB_T_R	Antimony, Total Recoverable	19.2		mg/kg
											AS_T_R	Arsenic, Total Recoverable	176		mg/kg
											BA_T_R	Barium, Total Recoverable	427		mg/kg
											CD_T_R	Cadmium, Total Recoverable	63.1		mg/kg
											CR_T_R	Chromium, Total Recoverable	22.6		mg/kg
											CO_T_R	Cobalt, Total Recoverable	4.4 J	J	mg/kg
											CU_T_R	Copper, Total Recoverable	367		mg/kg
											FE_T_R	Iron, Total Recoverable	14600		mg/kg
											PB_T_R	Lead, Total Recoverable	77.1		mg/kg
											MN_T_R	Manganese, Total Recoverable	165		mg/kg
											HG_T_R	Mercury, Total Recoverable	79.3 J	J	mg/kg
											NI_T_R	Nickel, Total Recoverable	19.9		mg/kg
											AG_T_R	Silver, Total Recoverable	3.7		mg/kg
											ZN_T_R	Zinc, Total Recoverable	576		mg/kg
CML-SS-07	CML-SS-07 (5-7 ft)	BP-CML-SS-07-05	10163643	10163643003	7/15/2011	Soil	988722.44	829153.27	5	7	MOISTURE	Soil Moisture	13.1		%
											SB_T_R	Antimony, Total Recoverable	30.3		mg/kg
											AS_T_R	Arsenic, Total Recoverable	39.5		mg/kg
											BA_T_R	Barium, Total Recoverable	151		mg/kg
											CD_T_R	Cadmium, Total Recoverable	1.5 J	J	mg/kg
											CR_T_R	Chromium, Total Recoverable	5.2 J	J	mg/kg
											CO_T_R	Cobalt, Total Recoverable	43.1 J	J	mg/kg
											CU_T_R	Copper, Total Recoverable	231		mg/kg
											FE_T_R	Iron, Total Recoverable	22400		mg/kg
											PB_T_R	Lead, Total Recoverable	167		mg/kg
											MN_T_R	Manganese, Total Recoverable	1600		mg/kg
											HG_T_R	Mercury, Total Recoverable	67.5 J	J	mg/kg
											NI_T_R	Nickel, Total Recoverable	8		mg/kg
											AG_T_R	Silver, Total Recoverable	2.4		mg/kg
											ZN_T_R	Zinc, Total Recoverable	80.7		mg/kg
CML-SS-08	CML-SS-08 (7-9 ft)	BP-CML-SS-08-07	10163643	10163643006	7/15/2011	Soil	988475.16	828988.49	7	9	MOISTURE	Soil Moisture	23.7		%
											SB_T_R	Antimony, Total Recoverable	1.9		mg/kg
											AS_T_R	Arsenic, Total Recoverable	8.3		mg/kg
											BA_T_R	Barium, Total Recoverable	156		mg/kg
											CD_T_R	Cadmium, Total Recoverable	0.12 J	J	mg/kg
											CR_T_R	Chromium, Total Recoverable	5.4 J	J	mg/kg
											CO_T_R	Cobalt, Total Recoverable	14.4 J	J	mg/kg
											CU_T_R	Copper, Total Recoverable	35.1		mg/kg
											FE_T_R	Iron, Total Recoverable	18800		mg/kg
											PB_T_R	Lead, Total Recoverable	20.1		mg/kg
											MN_T_R	Manganese, Total Recoverable	457		mg/kg
											HG_T_R	Mercury, Total Recoverable	130 J	J	mg/kg
											NI_T_R	Nickel, Total Recoverable	7		mg/kg
											AG_T_R	Silver, Total Recoverable	7.1		mg/kg
											ZN_T_R	Zinc, Total Recoverable	178		mg/kg

APPENDIX B-8. SOLID-MATRIX ANALYTICAL RESULTS
COMBINATION MILL AOC
BLACK PINE MINE

Location	Sample ID	Field Sample ID	Lab Batch ID	Lab Sample ID	Date Sampled	Matrix	X	Y	Sample Start Depth	Sample End Depth	Tri Cas	Analyte	Value	Reviewer	Units
CML-SS-10	CML-SS-10 (6-7 ft)	BP-CML-SS-10-06	10163645	10163645005	7/15/2011	Soil	988236.27	829715.05	6	7	MOISTURE	Soil Moisture	17.2		%
											SB_T_R	Antimony, Total Recoverable	162		mg/kg
											AS_T_R	Arsenic, Total Recoverable	173		mg/kg
											BA_T_R	Barium, Total Recoverable	178		mg/kg
											CD_T_R	Cadmium, Total Recoverable	1.7		mg/kg
											CR_T_R	Chromium, Total Recoverable	ND(0.45)		mg/kg
											CO_T_R	Cobalt, Total Recoverable	14.7		mg/kg
											CU_T_R	Copper, Total Recoverable	606		mg/kg
											FE_T_R	Iron, Total Recoverable	49500		mg/kg
											PB_T_R	Lead, Total Recoverable	1830		mg/kg
											MN_T_R	Manganese, Total Recoverable	1050		mg/kg
											HG_T_R	Mercury, Total Recoverable	0.77 J	J	mg/kg
											NI_T_R	Nickel, Total Recoverable	7.9		mg/kg
											AG_T_R	Silver, Total Recoverable	9.5		mg/kg
											ZN_T_R	Zinc, Total Recoverable	251		mg/kg
CML-TS-01	CML-TS-01 (0-1 ft)	BP-CML-TS-01-00	10163645	10163645006	7/15/2011	Soil/Tailings	988616.41	830303.97	0	1	MOISTURE	Soil Moisture	10.7		%
											SB_T_R	Antimony, Total Recoverable	324		mg/kg
											AS_T_R	Arsenic, Total Recoverable	262		mg/kg
											BA_T_R	Barium, Total Recoverable	240		mg/kg
											CD_T_R	Cadmium, Total Recoverable	8.9		mg/kg
											CR_T_R	Chromium, Total Recoverable	3.3		mg/kg
											CO_T_R	Cobalt, Total Recoverable	7.6		mg/kg
											CU_T_R	Copper, Total Recoverable	1680		mg/kg
											FE_T_R	Iron, Total Recoverable	16900		mg/kg
											PB_T_R	Lead, Total Recoverable	2300		mg/kg
											MN_T_R	Manganese, Total Recoverable	620		mg/kg
											HG_T_R	Mercury, Total Recoverable	0.24 J	J	mg/kg
											NI_T_R	Nickel, Total Recoverable	5.7		mg/kg
											AG_T_R	Silver, Total Recoverable	26.5		mg/kg
											ZN_T_R	Zinc, Total Recoverable	198		mg/kg
CML-TS-01	CML-TS-01 (2-4 ft)	BP-CML-TS-01-02	10163645	10163645007	7/15/2011	Soil/Tailings	988616.41	830303.97	2	4	MOISTURE	Soil Moisture	40.1		%
											SULFUR_EX_HCL	Sulfur (HCL Extraction)	ND(0.05)		%
											SULFUR_EX_HNO3	Sulfur (HNO3 Extraction)	ND(0.05)		%
											SULFUR_HOTWATER_HNO3	Sulfur (Hot Water Extraction)	ND(0.05)		%
											SULFUR_RES	Sulfur, Residual	ND(0.05)		%
											SULFUR	Sulfur, Total	ND(0.05)		%
											SB_T_R	Antimony, Total Recoverable	23.3		mg/kg
											AS_T_R	Arsenic, Total Recoverable	24.2		mg/kg
											BA_T_R	Barium, Total Recoverable	483		mg/kg
											CD_T_R	Cadmium, Total Recoverable	8.7		mg/kg
											CR_T_R	Chromium, Total Recoverable	15		mg/kg
											CO_T_R	Cobalt, Total Recoverable	8		mg/kg
											CU_T_R	Copper, Total Recoverable	2140		mg/kg
											FE_T_R	Iron, Total Recoverable	13300		mg/kg
											PB_T_R	Lead, Total Recoverable	144		mg/kg
											MN_T_R	Manganese, Total Recoverable	269		mg/kg
											HG_T_R	Mercury, Total Recoverable	1 J	J	mg/kg
											NI_T_R	Nickel, Total Recoverable	13.3		mg/kg
											AG_T_R	Silver, Total Recoverable	1.3		mg/kg
											ZN_T_R	Zinc, Total Recoverable	213		mg/kg
											PH_SMPBUFFER	pH, SMP Buffer	5.9		Std Units
											ACIDBASE_POT	Acid Base Potential	2.2		t/1000t
											ACIDITY_POT	Acid Potential	ND(4.3)		t/1000t
											NEUT_POT	Neutralization Potential	2.2		t/1000t
											01305-78-8_REC	Recommended Lime	8.1		t/1000t
											SMPLIME_REQ	SMP Lime Requirement	5.9		t/1000t

APPENDIX B-8. SOLID-MATRIX ANALYTICAL RESULTS
COMBINATION MILL AOC
BLACK PINE MINE

Location	Sample ID	Field Sample ID	Lab Batch ID	Lab Sample ID	Date Sampled	Matrix	X	Y	Sample Start Depth	Sample End Depth	Tri Cas	Analyte	Value	Reviewer	Units
CML-TS-02	CML-TS-02 (0-1 ft)	BP-CML-TS-02-00	10163645	10163645009	7/15/2011	Soil/Tailings	988486.50	830048.85	0	1	MOISTURE	Soil Moisture	14.3		%
											SB_T_R	Antimony, Total Recoverable	6.9		mg/kg
											AS_T_R	Arsenic, Total Recoverable	11.2		mg/kg
											BA_T_R	Barium, Total Recoverable	34.7		mg/kg
											CD_T_R	Cadmium, Total Recoverable	0.84		mg/kg
											CR_T_R	Chromium, Total Recoverable	2.3		mg/kg
											CO_T_R	Cobalt, Total Recoverable	7.5		mg/kg
											CU_T_R	Copper, Total Recoverable	846		mg/kg
											FE_T_R	Iron, Total Recoverable	7930		mg/kg
											PB_T_R	Lead, Total Recoverable	32.3		mg/kg
											MN_T_R	Manganese, Total Recoverable	147		mg/kg
											HG_T_R	Mercury, Total Recoverable	0.3 J	J	mg/kg
											NI_T_R	Nickel, Total Recoverable	4.5		mg/kg
											AG_T_R	Silver, Total Recoverable	0.52		mg/kg
											ZN_T_R	Zinc, Total Recoverable	60.6		mg/kg
CML-TS-02	CML-TS-02 (2-4 ft)	BP-CML-TS-02-02	10163645	10163645010	7/15/2011	Soil/Tailings	988486.50	830048.85	2	4	MOISTURE	Soil Moisture	38.4		%
											SULFUR_EX_HCL	Sulfur (HCL Extraction)	ND(0.05)		%
											SULFUR_EX_HNO3	Sulfur (HNO3 Extraction)	0.0754		%
											SULFUR_HOTWATER_HNO3	Sulfur (Hot Water Extraction)	0.0697		%
											SULFUR_RES	Sulfur, Residual	ND(0.05)		%
											SULFUR	Sulfur, Total	0.174		%
											SB_T_R	Antimony, Total Recoverable	7.5		mg/kg
											AS_T_R	Arsenic, Total Recoverable	11.3		mg/kg
											BA_T_R	Barium, Total Recoverable	365		mg/kg
											CD_T_R	Cadmium, Total Recoverable	2.3		mg/kg
											CR_T_R	Chromium, Total Recoverable	10.1		mg/kg
											CO_T_R	Cobalt, Total Recoverable	12.8		mg/kg
											CU_T_R	Copper, Total Recoverable	92		mg/kg
											FE_T_R	Iron, Total Recoverable	9680		mg/kg
											PB_T_R	Lead, Total Recoverable	44.9		mg/kg
											MN_T_R	Manganese, Total Recoverable	297		mg/kg
											HG_T_R	Mercury, Total Recoverable	1.9		mg/kg
											NI_T_R	Nickel, Total Recoverable	13.9		mg/kg
											AG_T_R	Silver, Total Recoverable	1.1		mg/kg
											ZN_T_R	Zinc, Total Recoverable	159		mg/kg
											PH_SMPBUFFER	pH, SMP Buffer	5.9		Std Units
											ACIDBASE_POT	Acid Base Potential	3.2		t/1000t
											ACIDITY_POT	Acid Potential	ND(4.3)		t/1000t
											NEUT_POT	Neutralization Potential	3.2		t/1000t
											01305-78-8_REC	Recommended Lime	11		t/1000t
											SMPLIME_REQ	SMP Lime Requirement	5.9		t/1000t
CML-TS-03	CML-TS-03 (0-1 ft)	BP-CML-TS-03-00	10163645	10163645012	7/15/2011	Soil/Tailings	988666.65	829989.19	0	1	MOISTURE	Soil Moisture	38.2		%
											SB_T_R	Antimony, Total Recoverable	1370		mg/kg
											AS_T_R	Arsenic, Total Recoverable	1640		mg/kg
											BA_T_R	Barium, Total Recoverable	514		mg/kg
											CD_T_R	Cadmium, Total Recoverable	31.8		mg/kg
											CR_T_R	Chromium, Total Recoverable	ND(0.6)		mg/kg
											CO_T_R	Cobalt, Total Recoverable	1.9		mg/kg
											CU_T_R	Copper, Total Recoverable	5420		mg/kg
											FE_T_R	Iron, Total Recoverable	25100		mg/kg
											PB_T_R	Lead, Total Recoverable	837		mg/kg
											MN_T_R	Manganese, Total Recoverable	327		mg/kg
											HG_T_R	Mercury, Total Recoverable	9.9		mg/kg
											NI_T_R	Nickel, Total Recoverable	1.6		mg/kg
											AG_T_R	Silver, Total Recoverable	142		mg/kg
											ZN_T_R	Zinc, Total Recoverable	522		mg/kg
											MOISTURE	Soil Moisture	25.5		%

APPENDIX B-8. SOLID-MATRIX ANALYTICAL RESULTS
COMBINATION MILL AOC
BLACK PINE MINE

Location	Sample ID	Field Sample ID	Lab Batch ID	Lab Sample ID	Date Sampled	Matrix	X	Y	Sample Start Depth	Sample End Depth	Tri Cas	Analyte	Value	Reviewer	Units
CML-TS-03	CML-TS-03 (2-4 ft)	BP-CML-TS-03-02	10163645	10163645013	7/15/2011	Soil/Tailings	988666.65	829989.19	2	4	SULFUR_EX_HCL	Sulfur (HCL Extraction)	0.0702		%
											SULFUR_EX_HNO3	Sulfur (HNO3 Extraction)	ND(0.05)		%
											SULFUR_HOTWATER_HNO3	Sulfur (Hot Water Extraction)	0.126		%
											SULFUR_RES	Sulfur, Residual	ND(0.05)		%
											SULFUR	Sulfur, Total	0.201		%
											SB_T_R	Antimony, Total Recoverable	1730		mg/kg
											AS_T_R	Arsenic, Total Recoverable	1610		mg/kg
											BA_T_R	Barium, Total Recoverable	471		mg/kg
											CD_T_R	Cadmium, Total Recoverable	23.7		mg/kg
											CR_T_R	Chromium, Total Recoverable	ND(0.55)		mg/kg
											CO_T_R	Cobalt, Total Recoverable	ND(0.55)		mg/kg
											CU_T_R	Copper, Total Recoverable	6240		mg/kg
											FE_T_R	Iron, Total Recoverable	29300		mg/kg
											PB_T_R	Lead, Total Recoverable	9390		mg/kg
											MN_T_R	Manganese, Total Recoverable	167		mg/kg
											HG_T_R	Mercury, Total Recoverable	5.5		mg/kg
											NI_T_R	Nickel, Total Recoverable	0.69		mg/kg
											AG_T_R	Silver, Total Recoverable	110		mg/kg
											ZN_T_R	Zinc, Total Recoverable	735		mg/kg
											PH_SMPBUFFER	pH, SMP Buffer	7		Std Units
											ACIDBASE_POT	Acid Base Potential	0.74		t/1000t
											ACIDITY_POT	Acid Potential	ND(4.3)		t/1000t
											NEUT_POT	Neutralization Potential	0.74		t/1000t
											01305-78-8_REC	Recommended Lime	ND(5.4)		t/1000t
											SMPLIME_REQ	SMP Lime Requirement	0		t/1000t
CML-TS-04	CML-TS-04 (0-1 ft)	BP-CML-TS-04-00	10163640	10163640001	7/15/2011	Soil/Tailings	988406.32	829694.92	0	1	MOISTURE	Soil Moisture	21.2		%
											SB_T_R	Antimony, Total Recoverable	548		mg/kg
											AS_T_R	Arsenic, Total Recoverable	390		mg/kg
											BA_T_R	Barium, Total Recoverable	434		mg/kg
											CD_T_R	Cadmium, Total Recoverable	17.3		mg/kg
											CR_T_R	Chromium, Total Recoverable	9.8		mg/kg
											CO_T_R	Cobalt, Total Recoverable	2.2 J	J	mg/kg
											CU_T_R	Copper, Total Recoverable	3240		mg/kg
											FE_T_R	Iron, Total Recoverable	17500		mg/kg
											PB_T_R	Lead, Total Recoverable	2460		mg/kg
											MN_T_R	Manganese, Total Recoverable	143		mg/kg
											HG_T_R	Mercury, Total Recoverable	0.24 J	J	mg/kg
											NI_T_R	Nickel, Total Recoverable	6		mg/kg
											AG_T_R	Silver, Total Recoverable	48.7		mg/kg
											ZN_T_R	Zinc, Total Recoverable	278		mg/kg

APPENDIX B-8. SOLID-MATRIX ANALYTICAL RESULTS
COMBINATION MILL AOC
BLACK PINE MINE

Location	Sample ID	Field Sample ID	Lab Batch ID	Lab Sample ID	Date Sampled	Matrix	X	Y	Sample Start Depth	Sample End Depth	Tri Cas	Analyte	Value	Reviewer	Units
CML-TS-04	CML-TS-04 (2-4 ft)	BP-CML-TS-04-02	10163640	10163640002	7/15/2011	Soil/Tailings	988406.32	829694.92	2	4	MOISTURE	Soil Moisture	20.8		%
											SULFUR_EX_HCL	Sulfur (HCL Extraction)	ND(0.05)		%
											SULFUR_EX_HNO3	Sulfur (HNO3 Extraction)	ND(0.05)		%
											SULFUR_HOTWATER_HNO3	Sulfur (Hot Water Extraction)	ND(0.05)		%
											SULFUR_RES	Sulfur, Residual	ND(0.05)		%
											SULFUR	Sulfur, Total	ND(0.05)		%
											SB_T_R	Antimony, Total Recoverable	52.2		mg/kg
											AS_T_R	Arsenic, Total Recoverable	50.6		mg/kg
											BA_T_R	Barium, Total Recoverable	289		mg/kg
											CD_T_R	Cadmium, Total Recoverable	7.1		mg/kg
											CR_T_R	Chromium, Total Recoverable	11.8		mg/kg
											CO_T_R	Cobalt, Total Recoverable	8.4 J	J	mg/kg
											CU_T_R	Copper, Total Recoverable	846		mg/kg
											FE_T_R	Iron, Total Recoverable	19000		mg/kg
											PB_T_R	Lead, Total Recoverable	181		mg/kg
											MN_T_R	Manganese, Total Recoverable	298		mg/kg
											HG_T_R	Mercury, Total Recoverable	13.1 J	J	mg/kg
											NI_T_R	Nickel, Total Recoverable	8.5		mg/kg
											AG_T_R	Silver, Total Recoverable	4.2		mg/kg
											ZN_T_R	Zinc, Total Recoverable	139		mg/kg
											PH_SMPBUFFER	pH, SMP Buffer	5.8		Std Units
											ACIDBASE_POT	Acid Base Potential	1.2		t/1000t
											ACIDITY_POT	Acid Potential	ND(4.3)		t/1000t
											NEUT_POT	Neutralization Potential	1.2 J	J	t/1000t
											01305-78-8_REC	Recommended Lime	11		t/1000t
											SMPLIME_REQ	SMP Lime Requirement	8.1		t/1000t
CML-TS-05	CML-TS-05 (0-1 ft)	BP-CML-TS-05-00	10163640	10163640004	7/15/2011	Soil/Tailings	988516.20	829612.88	0	1	MOISTURE	Soil Moisture	23.3		%
											SB_T_R	Antimony, Total Recoverable	409		mg/kg
											AS_T_R	Arsenic, Total Recoverable	353		mg/kg
											BA_T_R	Barium, Total Recoverable	421		mg/kg
											CD_T_R	Cadmium, Total Recoverable	13.6		mg/kg
											CR_T_R	Chromium, Total Recoverable	11.5		mg/kg
											CO_T_R	Cobalt, Total Recoverable	7.8 J	J	mg/kg
											CU_T_R	Copper, Total Recoverable	2020		mg/kg
											FE_T_R	Iron, Total Recoverable	17300		mg/kg
											PB_T_R	Lead, Total Recoverable	1840		mg/kg
											MN_T_R	Manganese, Total Recoverable	418		mg/kg
											HG_T_R	Mercury, Total Recoverable	0.8 J	J	mg/kg
											NI_T_R	Nickel, Total Recoverable	8.2		mg/kg
											AG_T_R	Silver, Total Recoverable	28.4		mg/kg
											ZN_T_R	Zinc, Total Recoverable	311		mg/kg

APPENDIX B-8. SOLID-MATRIX ANALYTICAL RESULTS
COMBINATION MILL AOC
BLACK PINE MINE

Location	Sample ID	Field Sample ID	Lab Batch ID	Lab Sample ID	Date Sampled	Matrix	X	Y	Sample Start Depth	Sample End Depth	Tri Cas	Analyte	Value	Reviewer	Units
CML-TS-05	CML-TS-05 (2-4 ft)	BP-CML-TS-05-02	10163640	10163640005	7/15/2011	Soil/Tailings	988516.20	829612.88	2	4	MOISTURE	Soil Moisture	23.3		%
											SULFUR_EX_HCL	Sulfur (HCL Extraction)	ND(0.05)		%
											SULFUR_EX_HNO3	Sulfur (HNO3 Extraction)	0.0507		%
											SULFUR_HOTWATER_HNO3	Sulfur (Hot Water Extraction)	0.106		%
											SULFUR_RES	Sulfur, Residual	ND(0.05)		%
											SULFUR	Sulfur, Total	0.155		%
											SB_T_R	Antimony, Total Recoverable	1190		mg/kg
											AS_T_R	Arsenic, Total Recoverable	1020		mg/kg
											BA_T_R	Barium, Total Recoverable	615		mg/kg
											CD_T_R	Cadmium, Total Recoverable	21		mg/kg
											CR_T_R	Chromium, Total Recoverable	4.9		mg/kg
											CO_T_R	Cobalt, Total Recoverable	1.1 J	J	mg/kg
											CU_T_R	Copper, Total Recoverable	3690		mg/kg
											FE_T_R	Iron, Total Recoverable	20600		mg/kg
											PB_T_R	Lead, Total Recoverable	10000		mg/kg
											MN_T_R	Manganese, Total Recoverable	172		mg/kg
											HG_T_R	Mercury, Total Recoverable	2.5 J	J	mg/kg
											NI_T_R	Nickel, Total Recoverable	2.7		mg/kg
											AG_T_R	Silver, Total Recoverable	79.9		mg/kg
											ZN_T_R	Zinc, Total Recoverable	654		mg/kg
											PH_SMPBUFFER	pH, SMP Buffer	6.6		Std Units
											ACIDBASE_POT	Acid Base Potential	-1.6		t/1000t
											ACIDITY_POT	Acid Potential	1.6		t/1000t
											NEUT_POT	Neutralization Potential	ND(0.5)	UJ	t/1000t
											01305-78-8_REC	Recommended Lime	5		t/1000t
											SMPLIME_REQ	SMP Lime Requirement	2.4		t/1000t
CML-TS-06	CML-TS-06 (0-1 ft)	BP-CML-TS-06-00	10163640	10163640007	7/15/2011	Soil/Tailings	988459.01	829346.48	0	1	MOISTURE	Soil Moisture	19.8		%
											SB_T_R	Antimony, Total Recoverable	1040		mg/kg
											AS_T_R	Arsenic, Total Recoverable	830		mg/kg
											BA_T_R	Barium, Total Recoverable	463		mg/kg
											CD_T_R	Cadmium, Total Recoverable	30.7		mg/kg
											CR_T_R	Chromium, Total Recoverable	5.8		mg/kg
											CO_T_R	Cobalt, Total Recoverable	2 J	J	mg/kg
											CU_T_R	Copper, Total Recoverable	1740		mg/kg
											FE_T_R	Iron, Total Recoverable	15600		mg/kg
											PB_T_R	Lead, Total Recoverable	6790		mg/kg
											MN_T_R	Manganese, Total Recoverable	190		mg/kg
											HG_T_R	Mercury, Total Recoverable	0.4 J	J	mg/kg
											NI_T_R	Nickel, Total Recoverable	4.1		mg/kg
											AG_T_R	Silver, Total Recoverable	128		mg/kg
											ZN_T_R	Zinc, Total Recoverable	220		mg/kg

APPENDIX B-8. SOLID-MATRIX ANALYTICAL RESULTS
COMBINATION MILL AOC
BLACK PINE MINE

Location	Sample ID	Field Sample ID	Lab Batch ID	Lab Sample ID	Date Sampled	Matrix	X	Y	Sample Start Depth	Sample End Depth	Tri Cas	Analyte	Value	Reviewer	Units
CML-TS-06	CML-TS-06 (2-4 ft)	BP-CML-TS-06-02	10163640	10163640008	7/15/2011	Soil/Tailings	988459.01	829346.48	2	4	MOISTURE	Soil Moisture	16.4		%
											SULFUR_EX_HCL	Sulfur (HCL Extraction)	ND(0.05)		%
											SULFUR_EX_HNO3	Sulfur (HNO3 Extraction)	ND(0.05)		%
											SULFUR_HOTWATER_HNO3	Sulfur (Hot Water Extraction)	ND(0.05)		%
											SULFUR_RES	Sulfur, Residual	ND(0.05)		%
											SULFUR	Sulfur, Total	0.097		%
											SB_T_R	Antimony, Total Recoverable	1410		mg/kg
											AS_T_R	Arsenic, Total Recoverable	1070		mg/kg
											BA_T_R	Barium, Total Recoverable	397		mg/kg
											CD_T_R	Cadmium, Total Recoverable	22		mg/kg
											CR_T_R	Chromium, Total Recoverable	4.1		mg/kg
											CO_T_R	Cobalt, Total Recoverable	1.3 J	J	mg/kg
											CU_T_R	Copper, Total Recoverable	4040		mg/kg
											FE_T_R	Iron, Total Recoverable	22600		mg/kg
											PB_T_R	Lead, Total Recoverable	6960		mg/kg
											MN_T_R	Manganese, Total Recoverable	246		mg/kg
											HG_T_R	Mercury, Total Recoverable	46.1 J	J	mg/kg
											NI_T_R	Nickel, Total Recoverable	2.4		mg/kg
											AG_T_R	Silver, Total Recoverable	99.9		mg/kg
											ZN_T_R	Zinc, Total Recoverable	334		mg/kg
											PH_SMPBUFFER	pH, SMP Buffer	7.3		Std Units
											ACIDBASE_POT	Acid Base Potential	2.4		t/1000t
											ACIDITY_POT	Acid Potential	ND(4.3)		t/1000t
											NEUT_POT	Neutralization Potential	2.4 J	J	t/1000t
											01305-78-8_REC	Recommended Lime	ND(5.4)		t/1000t
											SMPLIME_REQ	SMP Lime Requirement	0		t/1000t
CML-TS-07	CML-TS-07 (0-1 ft)	BP-CML-TS-07-00	10163643	10163643001	7/15/2011	Soil/Tailings	988722.44	829153.27	0	1	MOISTURE	Soil Moisture	20.4		%
											SB_T_R	Antimony, Total Recoverable	529		mg/kg
											AS_T_R	Arsenic, Total Recoverable	496		mg/kg
											BA_T_R	Barium, Total Recoverable	289		mg/kg
											CD_T_R	Cadmium, Total Recoverable	7.5 J	J	mg/kg
											CR_T_R	Chromium, Total Recoverable	3.7 J	J	mg/kg
											CO_T_R	Cobalt, Total Recoverable	4.3 J	J	mg/kg
											CU_T_R	Copper, Total Recoverable	1110		mg/kg
											FE_T_R	Iron, Total Recoverable	27600		mg/kg
											PB_T_R	Lead, Total Recoverable	2650		mg/kg
											MN_T_R	Manganese, Total Recoverable	315		mg/kg
											HG_T_R	Mercury, Total Recoverable	215 J	J	mg/kg
											NI_T_R	Nickel, Total Recoverable	9.3		mg/kg
											AG_T_R	Silver, Total Recoverable	52.5		mg/kg
											ZN_T_R	Zinc, Total Recoverable	250		mg/kg

APPENDIX B-8. SOLID-MATRIX ANALYTICAL RESULTS
COMBINATION MILL AOC
BLACK PINE MINE

Location	Sample ID	Field Sample ID	Lab Batch ID	Lab Sample ID	Date Sampled	Matrix	X	Y	Sample Start Depth	Sample End Depth	Tri Cas	Analyte	Value	Reviewer	Units
CML-TS-07	CML-TS-07 (2-4 ft)	BP-CML-TS-07-02	10163643	10163643002	7/15/2011	Soil/Tailings	988722.44	829153.27	2	4	MOISTURE	Soil Moisture	8.2		%
											SULFUR_EX_HCL	Sulfur (HCL Extraction)	ND(0.05)		%
											SULFUR_EX_HNO3	Sulfur (HNO3 Extraction)	ND(0.05)		%
											SULFUR_HOTWATER_HNO3	Sulfur (Hot Water Extraction)	ND(0.05)		%
											SULFUR_RES	Sulfur, Residual	ND(0.05)		%
											SULFUR	Sulfur, Total	0.053		%
											SB_T_R	Antimony, Total Recoverable	690		mg/kg
											AS_T_R	Arsenic, Total Recoverable	633		mg/kg
											BA_T_R	Barium, Total Recoverable	207		mg/kg
											CD_T_R	Cadmium, Total Recoverable	12.5 J	J	mg/kg
											CR_T_R	Chromium, Total Recoverable	ND(0.52)	UJ	mg/kg
											CO_T_R	Cobalt, Total Recoverable	0.93 J	J	mg/kg
											CU_T_R	Copper, Total Recoverable	941		mg/kg
											FE_T_R	Iron, Total Recoverable	15500		mg/kg
											PB_T_R	Lead, Total Recoverable	3290		mg/kg
											MN_T_R	Manganese, Total Recoverable	289		mg/kg
											HG_T_R	Mercury, Total Recoverable	221 J	J	mg/kg
											NI_T_R	Nickel, Total Recoverable	1.6		mg/kg
											AG_T_R	Silver, Total Recoverable	96.2		mg/kg
											ZN_T_R	Zinc, Total Recoverable	334		mg/kg
											PH_SMPBUFFER	pH, SMP Buffer	7.3		Std Units
											ACIDBASE_POT	Acid Base Potential	0.73		t/1000t
											ACIDITY_POT	Acid Potential	ND(4.3)		t/1000t
											NEUT_POT	Neutralization Potential	0.73		t/1000t
											01305-78-8_REC	Recommended Lime	ND(5.4)		t/1000t
											SMPLIME_REQ	SMP Lime Requirement	0		t/1000t
CML-TS-08	CML-TS-08 (0-1 ft)	BP-CML-TS-08-00	10163643	10163643004	7/15/2011	Soil/Tailings	988475.16	828988.49	0	1	MOISTURE	Soil Moisture	25.4		%
											SB_T_R	Antimony, Total Recoverable	233		mg/kg
											AS_T_R	Arsenic, Total Recoverable	188		mg/kg
											BA_T_R	Barium, Total Recoverable	146		mg/kg
											CD_T_R	Cadmium, Total Recoverable	4.3 J	J	mg/kg
											CR_T_R	Chromium, Total Recoverable	2.8 J	J	mg/kg
											CO_T_R	Cobalt, Total Recoverable	2.3 J	J	mg/kg
											CU_T_R	Copper, Total Recoverable	687		mg/kg
											FE_T_R	Iron, Total Recoverable	16000		mg/kg
											PB_T_R	Lead, Total Recoverable	1290		mg/kg
											MN_T_R	Manganese, Total Recoverable	183		mg/kg
											HG_T_R	Mercury, Total Recoverable	10.8 J	J	mg/kg
											NI_T_R	Nickel, Total Recoverable	3.4		mg/kg
											AG_T_R	Silver, Total Recoverable	20.8		mg/kg
											ZN_T_R	Zinc, Total Recoverable	118		mg/kg

APPENDIX B-8. SOLID-MATRIX ANALYTICAL RESULTS
COMBINATION MILL AOC
BLACK PINE MINE

Location	Sample ID	Field Sample ID	Lab Batch ID	Lab Sample ID	Date Sampled	Matrix	X	Y	Sample Start Depth	Sample End Depth	Tri Cas	Analyte	Value	Reviewer	Units
CML-TS-08	CML-TS-08 (5-7 ft)	BP-CML-TS-08-05	10163643	10163643005	7/15/2011	Soil/Tailings	988475.16	828988.49	5	7	MOISTURE	Soil Moisture	34.5		%
											SULFUR_EX_HCL	Sulfur (HCL Extraction)	ND(0.05)		%
											SULFUR_EX_HNO3	Sulfur (HNO3 Extraction)	ND(0.05)		%
											SULFUR_HOTWATER_HNO3	Sulfur (Hot Water Extraction)	ND(0.05)		%
											SULFUR_RES	Sulfur, Residual	ND(0.05)		%
											SULFUR	Sulfur, Total	0.0605		%
											SB_T_R	Antimony, Total Recoverable	360		mg/kg
											AS_T_R	Arsenic, Total Recoverable	340		mg/kg
											BA_T_R	Barium, Total Recoverable	337		mg/kg
											CD_T_R	Cadmium, Total Recoverable	8.2 J	J	mg/kg
											CR_T_R	Chromium, Total Recoverable	ND(0.52)	UJ	mg/kg
											CO_T_R	Cobalt, Total Recoverable	4.2 J	J	mg/kg
											CU_T_R	Copper, Total Recoverable	1610		mg/kg
											FE_T_R	Iron, Total Recoverable	26600		mg/kg
											PB_T_R	Lead, Total Recoverable	2990		mg/kg
											MN_T_R	Manganese, Total Recoverable	1120		mg/kg
											HG_T_R	Mercury, Total Recoverable	7.4 J	J	mg/kg
											NI_T_R	Nickel, Total Recoverable	3.7		mg/kg
											AG_T_R	Silver, Total Recoverable	113		mg/kg
											ZN_T_R	Zinc, Total Recoverable	194		mg/kg
											PH_SMPBUFFER	pH, SMP Buffer	7.1		Std Units
											ACIDBASE_POT	Acid Base Potential	8.3		t/1000t
											ACIDITY_POT	Acid Potential	ND(4.3)		t/1000t
											NEUT_POT	Neutralization Potential	8.3		t/1000t
											01305-78-8_REC	Recommended Lime	ND(5.4)		t/1000t
											SMPLIME_REQ	SMP Lime Requirement	0		t/1000t
CML-TS-09	CML-TS-09 (0-1 ft)	BP-CML-TS-09-00	10163643	10163643007	7/15/2011	Soil/Tailings	988657.50	828897.92	0	1	MOISTURE	Soil Moisture	34.5		%
											SB_T_R	Antimony, Total Recoverable	3210		mg/kg
											AS_T_R	Arsenic, Total Recoverable	2440		mg/kg
											BA_T_R	Barium, Total Recoverable	424		mg/kg
											CD_T_R	Cadmium, Total Recoverable	49.2 J	J	mg/kg
											CR_T_R	Chromium, Total Recoverable	ND(0.64)	UJ	mg/kg
											CO_T_R	Cobalt, Total Recoverable	4.8 J	J	mg/kg
											CU_T_R	Copper, Total Recoverable	6630		mg/kg
											FE_T_R	Iron, Total Recoverable	52500		mg/kg
											PB_T_R	Lead, Total Recoverable	9520		mg/kg
											MN_T_R	Manganese, Total Recoverable	439		mg/kg
											HG_T_R	Mercury, Total Recoverable	ND(0.024)	UJ	mg/kg
											NI_T_R	Nickel, Total Recoverable	6.2		mg/kg
											AG_T_R	Silver, Total Recoverable	168		mg/kg
											ZN_T_R	Zinc, Total Recoverable	1110		mg/kg
CML-TS-09	CML-TS-09 (2-4 ft)	BP-CML-TS-09-02	10163643	10163643008	7/15/2011	Soil/Tailings	988657.50	828897.92	2	4	MOISTURE	Soil Moisture	18.6		%
											SB_T_R	Antimony, Total Recoverable	1280		mg/kg
											AS_T_R	Arsenic, Total Recoverable	5140		mg/kg
											BA_T_R	Barium, Total Recoverable	464		mg/kg
											CD_T_R	Cadmium, Total Recoverable	13.2 J	J	mg/kg
											CR_T_R	Chromium, Total Recoverable	ND(0.49)	UJ	mg/kg
											CO_T_R	Cobalt, Total Recoverable	2.5 J	J	mg/kg
											CU_T_R	Copper, Total Recoverable	3120		mg/kg
											FE_T_R	Iron, Total Recoverable	60700		mg/kg
											PB_T_R	Lead, Total Recoverable	23600		mg/kg
											MN_T_R	Manganese, Total Recoverable	84.4		mg/kg
											HG_T_R	Mercury, Total Recoverable	0.64 J	J	mg/kg
											NI_T_R	Nickel, Total Recoverable	3.6		mg/kg
											AG_T_R	Silver, Total Recoverable	119		mg/kg
											ZN_T_R	Zinc, Total Recoverable	122		mg/kg

APPENDIX B-8. SOLID-MATRIX ANALYTICAL RESULTS
COMBINATION MILL AOC
BLACK PINE MINE

Location	Sample ID	Field Sample ID	Lab Batch ID	Lab Sample ID	Date Sampled	Matrix	X	Y	Sample Start Depth	Sample End Depth	Tri Cas	Analyte	Value	Reviewer	Units
CML-TS-09	CML-TS-09 (4-6 ft)	BP-CML-TS-09-04	10163643	10163643009	7/15/2011	Soil/Tailings	988657.50	828897.92	4	6	MOISTURE	Soil Moisture	16.2		%
											SB_T_R	Antimony, Total Recoverable	2540		mg/kg
											AS_T_R	Arsenic, Total Recoverable	4980		mg/kg
											BA_T_R	Barium, Total Recoverable	315		mg/kg
											CD_T_R	Cadmium, Total Recoverable	35.2 J	J	mg/kg
											CR_T_R	Chromium, Total Recoverable	ND(0.54)	UJ	mg/kg
											CO_T_R	Cobalt, Total Recoverable	1.7 J	J	mg/kg
											CU_T_R	Copper, Total Recoverable	5580		mg/kg
											FE_T_R	Iron, Total Recoverable	67700		mg/kg
											PB_T_R	Lead, Total Recoverable	15100		mg/kg
											MN_T_R	Manganese, Total Recoverable	234		mg/kg
											HG_T_R	Mercury, Total Recoverable	137 J	J	mg/kg
											NI_T_R	Nickel, Total Recoverable	2.2		mg/kg
											AG_T_R	Silver, Total Recoverable	108		mg/kg
											ZN_T_R	Zinc, Total Recoverable	273		mg/kg
CML-TS-09	CML-TS-09 (6-8 ft)	BP-CML-TS-09-06	10163643	10163643010	7/15/2011	Soil/Tailings	988657.50	828897.92	6	8	MOISTURE	Soil Moisture	22.6		%
											SB_T_R	Antimony, Total Recoverable	15700		mg/kg
											AS_T_R	Arsenic, Total Recoverable	4200		mg/kg
											BA_T_R	Barium, Total Recoverable	390		mg/kg
											CD_T_R	Cadmium, Total Recoverable	99.9 J	J	mg/kg
											CR_T_R	Chromium, Total Recoverable	ND(0.56)	UJ	mg/kg
											CO_T_R	Cobalt, Total Recoverable	14.6 J	J	mg/kg
											CU_T_R	Copper, Total Recoverable	22700		mg/kg
											FE_T_R	Iron, Total Recoverable	50700		mg/kg
											PB_T_R	Lead, Total Recoverable	12600		mg/kg
											MN_T_R	Manganese, Total Recoverable	815		mg/kg
											HG_T_R	Mercury, Total Recoverable	4.1 J	J	mg/kg
											NI_T_R	Nickel, Total Recoverable	20.7		mg/kg
											AG_T_R	Silver, Total Recoverable	159		mg/kg
											ZN_T_R	Zinc, Total Recoverable	1570		mg/kg
CML-TS-10	CML-TS-10 (0-1 ft)	BP-CML-TS-10-00	10163645	10163645003	7/15/2011	Soil/Tailings	988249.08	829777.32	0	1	MOISTURE	Soil Moisture	12		%
											SULFUR_EX_HCL	Sulfur (HCL Extraction)	0.0825		%
											SULFUR_EX_HNO3	Sulfur (HNO3 Extraction)	ND(0.05)		%
											SULFUR_HOTWATER_HNO3	Sulfur (Hot Water Extraction)	0.144		%
											SULFUR_RES	Sulfur, Residual	ND(0.05)		%
											SULFUR	Sulfur, Total	0.227		%
											SB_T_R	Antimony, Total Recoverable	1090		mg/kg
											AS_T_R	Arsenic, Total Recoverable	1250		mg/kg
											BA_T_R	Barium, Total Recoverable	378		mg/kg
											CD_T_R	Cadmium, Total Recoverable	5.8		mg/kg
											CR_T_R	Chromium, Total Recoverable	ND(0.5)		mg/kg
											CO_T_R	Cobalt, Total Recoverable	0.98		mg/kg
											CU_T_R	Copper, Total Recoverable	2160		mg/kg
											FE_T_R	Iron, Total Recoverable	42900		mg/kg
											PB_T_R	Lead, Total Recoverable	8010		mg/kg
											MN_T_R	Manganese, Total Recoverable	254		mg/kg
											HG_T_R	Mercury, Total Recoverable	0.33 J	J	mg/kg
											NI_T_R	Nickel, Total Recoverable	1.8		mg/kg
											AG_T_R	Silver, Total Recoverable	62.3		mg/kg
											ZN_T_R	Zinc, Total Recoverable	989		mg/kg
											PH_SMPBUFFER	pH, SMP Buffer	6.9		Std Units
											ACIDBASE_POT	Acid Base Potential	0		t/1000t
											ACIDITY_POT	Acid Potential	ND(4.3)		t/1000t
											NEUT_POT	Neutralization Potential	ND(0.5)		t/1000t
											01305-78-8_REC	Recommended Lime	ND(5.4)		t/1000t
											SMPLIME_REQ	SMP Lime Requirement	0.3		t/1000t

APPENDIX B-8. SOLID-MATRIX ANALYTICAL RESULTS
COMBINATION MILL AOC
BLACK PINE MINE

Location	Sample ID	Field Sample ID	Lab Batch ID	Lab Sample ID	Date Sampled	Matrix	X	Y	Sample Start Depth	Sample End Depth	Tri Cas	Analyte	Value	Reviewer	Units
CML-TS-10	CML-TS-10 (2-4 ft)	BP-CML-TS-10-02	10163645	10163645004	7/15/2011	Soil/Tailings	988249.08	829777.32	2	4	MOISTURE	Soil Moisture	25		%
											SB_T_R	Antimony, Total Recoverable	1110		mg/kg
											AS_T_R	Arsenic, Total Recoverable	1400		mg/kg
											BA_T_R	Barium, Total Recoverable	616		mg/kg
											CD_T_R	Cadmium, Total Recoverable	4.4		mg/kg
											CR_T_R	Chromium, Total Recoverable	ND(0.48)		mg/kg
											CO_T_R	Cobalt, Total Recoverable	ND(0.48)		mg/kg
											CU_T_R	Copper, Total Recoverable	1340		mg/kg
											FE_T_R	Iron, Total Recoverable	21600		mg/kg
											PB_T_R	Lead, Total Recoverable	2490		mg/kg
											MN_T_R	Manganese, Total Recoverable	169		mg/kg
											HG_T_R	Mercury, Total Recoverable	0.59 J	J	mg/kg
											NI_T_R	Nickel, Total Recoverable	ND(0.48)		mg/kg
											AG_T_R	Silver, Total Recoverable	10.5		mg/kg
											ZN_T_R	Zinc, Total Recoverable	419		mg/kg

[a] Silver was included in original laboratory analytical reports, but was removed in revised reports by the laboratory

J – Estimated concentration

UJ – Estimated reporting limit

ft - feet

meq/100g - milliequivalents per hundred grams

mg/kg - milligrams per kilogram

mmhos/cm - micromhos per centimeter

% - percent

ND() - Analyte was not detected (reporting limit)

Std Units - Standard Units

t/1000t - tons per thousand tons

APPENDIX B9

SURFACE WATER-MATRIX ANALYTICAL RESULTS, COMBINATION MILL AOC

APPENDIX B-9. SURFACE WATER-MATRIX ANALYTICAL RESULTS
COMBINATION MILL AOC
BLACK PINE MINE

Location	Sample ID	Field Sample ID	Lab Batch ID	Lab Sample ID	Date Sampled	Matrix	X	Y	Tri Cas	Analyte[a]	Value	Reviewer Qualifier	Units
CML-SW-01	CML-SW-01	CML-SW-01	10160756	10160756005	6/15/2011	Water	989313.0628	838754.647	ACIDITY	Acidity	21,500		ug/L
									ALKLNTY	Alkalinity	6,800		ug/L
									SB_T_R	Antimony, Total Recoverable	3.4		ug/L
									AS_T_R	Arsenic, Total Recoverable	1.7		ug/L
									BA_T_R	Barium, Total Recoverable	36.6		ug/L
									CD_T_R	Cadmium, Total Recoverable	0.15		ug/L
									CR_T_R	Chromium, Total Recoverable	0.83		ug/L
									CU_T_R	Copper, Total Recoverable	17.4		ug/L
									FE_T_R	Iron, Total Recoverable	617 J	J	ug/L
									PB_T_R	Lead, Total Recoverable	3.8 JB	JB	ug/L
									MN_T_R	Manganese, Total	7.1		ug/L
									NI_T_R	Nickel, Total Recoverable	0.88		ug/L
									AG_T_R	Silver, Total Recoverable	ND(0.5)	UJ	ug/L
									TDS	Solids, Total Dissolved	39,000		ug/L
									TSS	Solids, Total Suspended	1,400		ug/L
									SULFATE	Sulfate	3,500		ug/L
									ZN_T_R	Zinc, Total Recoverable	14.2		ug/L
									FLOW	Flow	34333.2		gpm
									O2_DIS	Oxygen, Dissolved	10,400		ug/L
									PH	pH	7.16		Std Units
									F	Conductance Field	20		umhos/cm
									TEMP	Temperature	7.4		oC
			10160853	10160853006					HG_T_R	Mercury, Total Recoverable	0.357		ug/L
CML-SW-02	CML-SW-02	CML-SW-02	10160756	10160756003	6/15/2011	Water	988686.083	831557.868	ACIDITY	Acidity	21,500		ug/L
									ALKLNTY	Alkalinity	7,700		ug/L
									SB_T_R	Antimony, Total Recoverable	1.7 J	J	ug/L
									AS_T_R	Arsenic, Total Recoverable	1.2 J	J	ug/L
									BA_T_R	Barium, Total Recoverable	43.5		ug/L
									CD_T_R	Cadmium, Total Recoverable	0.095		ug/L
									CR_T_R	Chromium, Total Recoverable	0.71 J	J	ug/L
									CU_T_R	Copper, Total Recoverable	14 J	J	ug/L
									FE_T_R	Iron, Total Recoverable	420 J	J	ug/L
									PB_T_R	Lead, Total Recoverable	5.1 J	J	ug/L
									MN_T_R	Manganese, Total	10.4 J	J	ug/L
									NI_T_R	Nickel, Total Recoverable	0.77		ug/L
									AG_T_R	Silver, Total Recoverable	ND(0.5)	UJ	ug/L
									TDS	Solids, Total Dissolved	37,000		ug/L
									TSS	Solids, Total Suspended	1,700		ug/L
									SULFATE	Sulfate	2,800		ug/L
									ZN_T_R	Zinc, Total Recoverable	7		ug/L
									FLOW	Flow	21632.16		gpm
									O2_DIS	Oxygen, Dissolved	10,300		ug/L
									PH	pH	7.21		Std Units
									F	Conductance Field	20		umhos/cm
									TEMP	Temperature	7.8		oC
			10160853	10160853013					HG_T_R	Mercury, Total Recoverable	0.0772		ug/L

APPENDIX B-9. SURFACE WATER-MATRIX ANALYTICAL RESULTS
COMBINATION MILL AOC
BLACK PINE MINE

Location	Sample ID	Field Sample ID	Lab Batch ID	Lab Sample ID	Date Sampled	Matrix	X	Y	Tri Cas	Analyte[a]	Value	Reviewer Qualifier	Units
CML-SW-03	CML-SW-03	CML-SW-03	10160655	10160655002	6/15/2011	Water	988786.478	829207.604	ACIDITY	Acidity	13,900		ug/L
									ALKLNTY	Alkalinity	11,700		ug/L
									SB_T_R	Antimony, Total Recoverable	1.9		ug/L
									AS_T_R	Arsenic, Total Recoverable	2.3		ug/L
									BA_T_R	Barium, Total Recoverable	59.1		ug/L
									CD_T_R	Cadmium, Total Recoverable	ND(0.08)		ug/L
									CR_T_R	Chromium, Total Recoverable	1.2		ug/L
									CU_T_R	Copper, Total Recoverable	20.8		ug/L
									FE_T_R	Iron, Total Recoverable	1,450 J	J	ug/L
									PB_T_R	Lead, Total Recoverable	2.9 JB	JB	ug/L
									MN_T_R	Manganese, Total	8.8		ug/L
									NI_T_R	Nickel, Total Recoverable	1.7		ug/L
									AG_T_R	Silver, Total Recoverable	ND(0.5)		ug/L
									TDS	Solids, Total Dissolved	103,000		ug/L
									TSS	Solids, Total Suspended	2,000		ug/L
									SULFATE	Sulfate	6,700		ug/L
									ZN_T_R	Zinc, Total Recoverable	10.5		ug/L
									FLOW	Flow	1234.2		gpm
									O2_DIS	Oxygen, Dissolved	10,700		ug/L
									PH	pH	7.06		Std Units
									SPCON_F	Conductance Field	39		umhos/cm
									TEMP	Temperature	5.5		oC
			10160853	10160853003					HG_T_R	Mercury, Total Recoverable	0.123		ug/L
CML-SW-04	CML-SW-04	CML-SW-04	10160655	10160655008	6/15/2011	Water	988269.426	828557.353	ACIDITY	Acidity	10,100		ug/L
									ALKLNTY	Alkalinity	7,800		ug/L
									SB_T_R	Antimony, Total Recoverable	ND(0.5)		ug/L
									AS_T_R	Arsenic, Total Recoverable	0.53		ug/L
									BA_T_R	Barium, Total Recoverable	41.1		ug/L
									CD_T_R	Cadmium, Total Recoverable	ND(0.08)		ug/L
									CR_T_R	Chromium, Total Recoverable	0.62		ug/L
									CU_T_R	Copper, Total Recoverable	3.8		ug/L
									FE_T_R	Iron, Total Recoverable	288 J	J	ug/L
									PB_T_R	Lead, Total Recoverable	0.31/ND(0.31)U	U	ug/L
									MN_T_R	Manganese, Total	4.7		ug/L
									NI_T_R	Nickel, Total Recoverable	0.54		ug/L
									AG_T_R	Silver, Total Recoverable	ND(0.5)		ug/L
									TDS	Solids, Total Dissolved	29,000		ug/L
									TSS	Solids, Total Suspended	1,500		ug/L
									SULFATE	Sulfate	2,600		ug/L
									ZN_T_R	Zinc, Total Recoverable	ND(5)		ug/L
									FLOW	Flow	21048.72		gpm
									O2_DIS	Oxygen, Dissolved	8,800		ug/L
									PH	pH	6.63		Std Units
									SPCON_F	Conductance Field	23		umhos/cm
									TEMP	Temperature	6.7		oC
			10160853	10160853014					HG_T_R	Mercury, Total Recoverable	0.0337		ug/L

APPENDIX B-9. SURFACE WATER-MATRIX ANALYTICAL RESULTS
COMBINATION MILL AOC
BLACK PINE MINE

Location	Sample ID	Field Sample ID	Lab Batch ID	Lab Sample ID	Date Sampled	Matrix	X	Y	Tri Cas	Analyte[a]	Value	Reviewer Qualifier	Units
CML-SW-05	CML-SW-05	BP-CML-SW-05	10160655	10160655010	6/15/2011	Water	987789.322	825202.771	HARDNE	Hardness, Total	6,630		ug/L
									ACIDITY	Acidity	20,500		ug/L
									ALKLNTY	Alkalinity	7,200		ug/L
									SB_T_R	Antimony, Total Recoverable	ND(0.5)		ug/L
									AS_T_R	Arsenic, Total Recoverable	ND(0.5)		ug/L
									BA_T_R	Barium, Total Recoverable	39.6		ug/L
									CD_T_R	Cadmium, Total Recoverable	ND(0.08)		ug/L
									CR_T_R	Chromium, Total Recoverable	ND(0.5)		ug/L
									CU_T_R	Copper, Total Recoverable	1		ug/L
									FE_T_R	Iron, Total Recoverable	162 J	J	ug/L
									PB_T_R	Lead, Total Recoverable	0.12/ND(0.12)U	U	ug/L
									MN_T_R	Manganese, Total	2.5		ug/L
									NI_T_R	Nickel, Total Recoverable	ND(0.5)		ug/L
									AG_T_R	Silver, Total Recoverable	ND(0.5)		ug/L
									TDS	Solids, Total Dissolved	24,000		ug/L
									TSS	Solids, Total Suspended	1,400		ug/L
									SULFATE	Sulfate	2,000		ug/L
									ZN_T_R	Zinc, Total Recoverable	ND(5)		ug/L
									FLOW	Flow	16560.72		gpm
									O2_DIS	Oxygen, Dissolved	10,700		ug/L
									PH	pH	7.46		Std Units
									SPCON_F	Conductance Field	16		umhos/cm
									TEMP	Temperature	6.4		oC
			10160853	10160853011					HG_T_R	Mercury, Total Recoverable	0.0042		ug/L
CML-SW-06	CML-SW-06	CML-SW-06	10160707	10160707003	6/13/2011	Water	988475.4747	829216.3495	ACIDITY	Acidity	ND(5,000)		ug/L
									ALKLNTY	Alkalinity	52,500		ug/L
									SB_T_R	Antimony, Total Recoverable	117		ug/L
									AS_T_R	Arsenic, Total Recoverable	36		ug/L
									BA_T_R	Barium, Total Recoverable	59.2		ug/L
									CD_T_R	Cadmium, Total Recoverable	1.1		ug/L
									CR_T_R	Chromium, Total Recoverable	1		ug/L
									CU_T_R	Copper, Total Recoverable	133		ug/L
									FE_T_R	Iron, Total Recoverable	117 J	J	ug/L
									PB_T_R	Lead, Total Recoverable	6.7		ug/L
									MN_T_R	Manganese, Total	39.1		ug/L
									NI_T_R	Nickel, Total Recoverable	3.2		ug/L
									AG_T_R	Silver, Total Recoverable	ND(0.5)		ug/L
									TDS	Solids, Total Dissolved	148,000		ug/L
									TSS	Solids, Total Suspended	2,400		ug/L
									SULFATE	Sulfate	60,000		ug/L
									ZN_T_R	Zinc, Total Recoverable	63.1		ug/L
									FLOW	Flow	NM		gpm
									O2_DIS	Oxygen, Dissolved	NM		mg/L
									PH	pH	NM		Std Units
									SPCON_F	Conductance Field	NM		umhos/cm
									TEMP	Temperature	NM		oC
			10160851	10160851009					HG_T_R	Mercury, Total Recoverable	1.91		ug/L

APPENDIX B-9. SURFACE WATER-MATRIX ANALYTICAL RESULTS
COMBINATION MILL AOC
BLACK PINE MINE

Location	Sample ID	Field Sample ID	Lab Batch ID	Lab Sample ID	Date Sampled	Matrix	X	Y	Tri Cas	Analyte[a]	Value	Reviewer Qualifier	Units
CML-SW-07	CML-SW-07	CML-SW-07	10160655	10160655001	6/14/2011	Water	988475.4747	830441.9448	ACIDITY	Acidity	23,400		ug/L
									ALKLNTY	Alkalinity	12,100		ug/L
									SB_T_R	Antimony, Total Recoverable	42.9		ug/L
									AS_T_R	Arsenic, Total Recoverable	12.8		ug/L
									BA_T_R	Barium, Total Recoverable	81.7		ug/L
									CD_T_R	Cadmium, Total Recoverable	1.2		ug/L
									CR_T_R	Chromium, Total Recoverable	1.3		ug/L
									CU_T_R	Copper, Total Recoverable	221		ug/L
									FE_T_R	Iron, Total Recoverable	1,430 J	J	ug/L
									PB_T_R	Lead, Total Recoverable	49		ug/L
									MN_T_R	Manganese, Total	12.9		ug/L
									NI_T_R	Nickel, Total Recoverable	2.1		ug/L
									AG_T_R	Silver, Total Recoverable	0.64		ug/L
									TDS	Solids, Total Dissolved	94,000		ug/L
									TSS	Solids, Total Suspended	1,800		ug/L
									SULFATE	Sulfate	8,000		ug/L
									ZN_T_R	Zinc, Total Recoverable	40.5		ug/L
									FLOW	Flow	NM		gpm
									O2_DIS	Oxygen, Dissolved	NM		mg/L
									PH	pH	NM		Std Units
									SPCON_F	Conductance Field	NM		umhos/cm
									TEMP	Temperature	NM		oC
			10160851	10160851004					HG_T_R	Mercury, Total Recoverable	2.52		ug/L
CML-SW-08	CML-SW-08	CML-SW-08	10160655	10160655003	6/15/2011	Water	987914.932	836670.883	ACIDITY	Acidity	16,700		ug/L
									ALKLNTY	Alkalinity	7,400		ug/L
									SB_T_R	Antimony, Total Recoverable	3.4		ug/L
									AS_T_R	Arsenic, Total Recoverable	1.7		ug/L
									BA_T_R	Barium, Total Recoverable	37.7		ug/L
									CD_T_R	Cadmium, Total Recoverable	0.12		ug/L
									CR_T_R	Chromium, Total Recoverable	0.68		ug/L
									CU_T_R	Copper, Total Recoverable	16.7		ug/L
									FE_T_R	Iron, Total Recoverable	381 J	J	ug/L
									PB_T_R	Lead, Total Recoverable	3.7 JB	JB	ug/L
									MN_T_R	Manganese, Total	5.8		ug/L
									NI_T_R	Nickel, Total Recoverable	0.72		ug/L
									AG_T_R	Silver, Total Recoverable	ND(0.5)		ug/L
									TDS	Solids, Total Dissolved	50,000		ug/L
									TSS	Solids, Total Suspended	2,100		ug/L
									SULFATE	Sulfate	3,400		ug/L
									ZN_T_R	Zinc, Total Recoverable	12.5		ug/L
									FLOW	Flow	29441.28		gpm
									O2_DIS	Oxygen, Dissolved	8,500		ug/L
									PH	pH	6.54		Std Units
									SPCON_F	Conductance Field	25		umhos/cm
									TEMP	Temperature	8.5		oC
			10160853	10160853007					HG_T_R	Mercury, Total Recoverable	0.193		ug/L

APPENDIX B-9. SURFACE WATER-MATRIX ANALYTICAL RESULTS
COMBINATION MILL AOC
BLACK PINE MINE

Location	Sample ID	Field Sample ID	Lab Batch ID	Lab Sample ID	Date Sampled	Matrix	X	Y	Tri Cas	Analyte[a]	Value	Reviewer Qualifier	Units
CML-SW-09	CML-SW-09	CML-SW-09	10160756	10160756006	6/15/2011	Water	987927.779	836610.153	ACIDITY	Acidity	17,700		ug/L
									ALKLNTY	Alkalinity	6,500		ug/L
									SB_T_R	Antimony, Total Recoverable	3		ug/L
									AS_T_R	Arsenic, Total Recoverable	1.4		ug/L
									BA_T_R	Barium, Total Recoverable	36.2		ug/L
									CD_T_R	Cadmium, Total Recoverable	0.13		ug/L
									CR_T_R	Chromium, Total Recoverable	0.83		ug/L
									CU_T_R	Copper, Total Recoverable	15.8		ug/L
									FE_T_R	Iron, Total Recoverable	406 J	J	ug/L
									PB_T_R	Lead, Total Recoverable	2.9 JB	JB	ug/L
									MN_T_R	Manganese, Total	6.1		ug/L
									NI_T_R	Nickel, Total Recoverable	0.84		ug/L
									AG_T_R	Silver, Total Recoverable	ND(0.5)	UJ	ug/L
									TDS	Solids, Total Dissolved	35,000		ug/L
									TSS	Solids, Total Suspended	2,300		ug/L
									SULFATE	Sulfate	3,500		ug/L
									ZN_T_R	Zinc, Total Recoverable	11.8		ug/L
									FLOW	Flow	27511.44		gpm
									O2_DIS	Oxygen, Dissolved	10,400		ug/L
									PH	pH	7.15		Std Units
									SPCON_F	Conductance Field	20		umhos/cm
									TEMP	Temperature	7.5		oC
			10160853	10160853001					HG_T_R	Mercury, Total Recoverable	0.178		ug/L
CML-SW-10	CML-SW-10	CML-SW-10	10160655	10160655004	6/15/2011	Water	988519.657	834758.136	ACIDITY	Acidity	21,500		ug/L
									ALKLNTY	Alkalinity	7,300		ug/L
									SB_T_R	Antimony, Total Recoverable	2.4		ug/L
									AS_T_R	Arsenic, Total Recoverable	1.2		ug/L
									BA_T_R	Barium, Total Recoverable	37		ug/L
									CD_T_R	Cadmium, Total Recoverable	0.12		ug/L
									CR_T_R	Chromium, Total Recoverable	0.9		ug/L
									CU_T_R	Copper, Total Recoverable	13.8		ug/L
									FE_T_R	Iron, Total Recoverable	338 J	J	ug/L
									PB_T_R	Lead, Total Recoverable	2.7 JB	JB	ug/L
									MN_T_R	Manganese, Total	5.2		ug/L
									NI_T_R	Nickel, Total Recoverable	1.6		ug/L
									AG_T_R	Silver, Total Recoverable	ND(0.5)		ug/L
									TDS	Solids, Total Dissolved	63,000		ug/L
									TSS	Solids, Total Suspended	2,000		ug/L
									SULFATE	Sulfate	3,300		ug/L
									ZN_T_R	Zinc, Total Recoverable	9.4		ug/L
									FLOW	Flow	29486.16		gpm
									O2_DIS	Oxygen, Dissolved	8,600		ug/L
									PH	pH	6.49		Std Units
									SPCON_F	Conductance Field	24		umhos/cm
									TEMP	Temperature	6.5		oC
			10160853	10160853010					HG_T_R	Mercury, Total Recoverable	0.221		ug/L

APPENDIX B-9. SURFACE WATER-MATRIX ANALYTICAL RESULTS
COMBINATION MILL AOC
BLACK PINE MINE

Location	Sample ID	Field Sample ID	Lab Batch ID	Lab Sample ID	Date Sampled	Matrix	X	Y	Tri Cas	Analyte[a]	Value	Reviewer Qualifier	Units
CML-SW-11	CML-SW-11	CML-SW-11	10160655	10160655011	6/15/2011	Water	989035.5467	832376.4931	ACIDITY	Acidity	7,300		ug/L
									ALKLNTY	Alkalinity	9,200		ug/L
									SB_T_R	Antimony, Total Recoverable	1.7		ug/L
									AS_T_R	Arsenic, Total Recoverable	0.9		ug/L
									BA_T_R	Barium, Total Recoverable	42		ug/L
									CD_T_R	Cadmium, Total Recoverable	0.09		ug/L
									CR_T_R	Chromium, Total Recoverable	0.75		ug/L
									CU_T_R	Copper, Total Recoverable	11.6		ug/L
									FE_T_R	Iron, Total Recoverable	400 J	J	ug/L
									PB_T_R	Lead, Total Recoverable	1.7 JB	JB	ug/L
									MN_T_R	Manganese, Total	5.8		ug/L
									NI_T_R	Nickel, Total Recoverable	0.77		ug/L
									AG_T_R	Silver, Total Recoverable	ND(0.5)		ug/L
									TDS	Solids, Total Dissolved	36,000		ug/L
									TSS	Solids, Total Suspended	1,800		ug/L
									SULFATE	Sulfate	2,900		ug/L
									ZN_T_R	Zinc, Total Recoverable	7.2		ug/L
									FLOW	Flow	25043.04		gpm
									O2_DIS	Oxygen, Dissolved	10,300		ug/L
									PH	pH	7.19		Std Units
									SPCON_F	Conductance Field	20		umhos/cm
									TEMP	Temperature	7.8		oC
			10160853	10160853002					HG_T_R	Mercury, Total Recoverable	0.196		ug/L
CML-SW-13	CML-SW-13	CML-SW-13	10160655	10160655009	6/15/2011	Water	987926.94	825441.073	ACIDITY	Acidity	ND(5,000)		ug/L
									ALKLNTY	Alkalinity	7,600		ug/L
									SB_T_R	Antimony, Total Recoverable	ND(0.5)		ug/L
									AS_T_R	Arsenic, Total Recoverable	ND(0.5)		ug/L
									BA_T_R	Barium, Total Recoverable	40.3		ug/L
									CD_T_R	Cadmium, Total Recoverable	ND(0.08)		ug/L
									CR_T_R	Chromium, Total Recoverable	0.54		ug/L
									CU_T_R	Copper, Total Recoverable	2.1		ug/L
									FE_T_R	Iron, Total Recoverable	168 J	J	ug/L
									PB_T_R	Lead, Total Recoverable	0.18/ND(0.18)U	U	ug/L
									MN_T_R	Manganese, Total	3.4		ug/L
									NI_T_R	Nickel, Total Recoverable	0.77		ug/L
									AG_T_R	Silver, Total Recoverable	ND(0.5)		ug/L
									TDS	Solids, Total Dissolved	26,000		ug/L
									TSS	Solids, Total Suspended	1,100		ug/L
									SULFATE	Sulfate	2,000		ug/L
									ZN_T_R	Zinc, Total Recoverable	6.8		ug/L
									FLOW	Flow	18580.32		gpm
									O2_DIS	Oxygen, Dissolved	8,800		ug/L
									PH	pH	6.83		Std Units
									SPCON_F	Conductance Field	20		umhos/cm
									TEMP	Temperature	6.4		oC
			10160853	10160853012					HG_T_R	Mercury, Total Recoverable	0.006		ug/L

APPENDIX B-9. SURFACE WATER-MATRIX ANALYTICAL RESULTS
COMBINATION MILL AOC
BLACK PINE MINE

Location	Sample ID	Field Sample ID	Lab Batch ID	Lab Sample ID	Date Sampled	Matrix	X	Y	Tri Cas	Analyte[a]	Value	Reviewer Qualifier	Units
CML-SW-14	CML-SW-14	CML-SW-14	10160756	10160756001	6/15/2011	Water	988380.293	829239.694	ACIDITY	Acidity	6,300		ug/L
									ALKLNTY	Alkalinity	7,800		ug/L
									SB_T_R	Antimony, Total Recoverable	ND(0.5)		ug/L
									AS_T_R	Arsenic, Total Recoverable	0.51		ug/L
									BA_T_R	Barium, Total Recoverable	38.6		ug/L
									CD_T_R	Cadmium, Total Recoverable	ND(0.08)		ug/L
									CR_T_R	Chromium, Total Recoverable	0.64		ug/L
									CU_T_R	Copper, Total Recoverable	3.5		ug/L
									FE_T_R	Iron, Total Recoverable	442 J	J	ug/L
									PB_T_R	Lead, Total Recoverable	0.36/ND(0.36)U	U	ug/L
									MN_T_R	Manganese, Total	8.1		ug/L
									NI_T_R	Nickel, Total Recoverable	0.57		ug/L
									AG_T_R	Silver, Total Recoverable	ND(0.5)	UJ	ug/L
									TDS	Solids, Total Dissolved	31,000		ug/L
									TSS	Solids, Total Suspended	1,900		ug/L
									SULFATE	Sulfate	2,500		ug/L
									ZN_T_R	Zinc, Total Recoverable	ND(5)		ug/L
									FLOW	Flow	20420.4		gpm
									O2_DIS	Oxygen, Dissolved	10,600		ug/L
									PH	pH	7.21		Std Units
									SPCON_F	Conductance Field	19		umhos/cm
									TEMP	Temperature	6.7		oC
			10160853	10160853004					HG_T_R	Mercury, Total Recoverable	0.0292		ug/L
CML-SW-15	CML-SW-15	CML-SW-15	10160655	10160655006	6/15/2011	Water	988363.329	829506.222	HARDNE	Hardness, Total	8,260		ug/L
									ACIDITY	Acidity	12,000		ug/L
									ALKLNTY	Alkalinity	8,300		ug/L
									SB_T_R	Antimony, Total Recoverable	ND(0.5)		ug/L
									AS_T_R	Arsenic, Total Recoverable	0.68		ug/L
									BA_T_R	Barium, Total Recoverable	42.5		ug/L
									CD_T_R	Cadmium, Total Recoverable	ND(0.08)		ug/L
									CR_T_R	Chromium, Total Recoverable	0.64		ug/L
									CU_T_R	Copper, Total Recoverable	5.8		ug/L
									FE_T_R	Iron, Total Recoverable	321 J	J	ug/L
									PB_T_R	Lead, Total Recoverable	0.61 JB	JB	ug/L
									MN_T_R	Manganese, Total	5.6		ug/L
									NI_T_R	Nickel, Total Recoverable	0.62		ug/L
									AG_T_R	Silver, Total Recoverable	ND(0.5)		ug/L
									TDS	Solids, Total Dissolved	34,000		ug/L
									TSS	Solids, Total Suspended	2,100		ug/L
									SULFATE	Sulfate	3,000		ug/L
									ZN_T_R	Zinc, Total Recoverable	ND(5)		ug/L
									FLOW	Flow	24280.08		gpm
									O2_DIS	Oxygen, Dissolved	8,700		ug/L
									PH	pH	6.69		Std Units
									SPCON_F	Conductance Field	25		umhos/cm
									TEMP	Temperature	7.4		oC
			10160853	10160853009					HG_T_R	Mercury, Total Recoverable	0.0336		ug/L

APPENDIX B-9. SURFACE WATER-MATRIX ANALYTICAL RESULTS
COMBINATION MILL AOC
BLACK PINE MINE

Location	Sample ID	Field Sample ID	Lab Batch ID	Lab Sample ID	Date Sampled	Matrix	X	Y	Tri Cas	Analyte[a]	Value	Reviewer Qualifier	Units
CML-SW-16	CML-SW-16	CML-SW-16	10160655	10160655005	6/15/2011	Water	988876.515	831915.386	ACIDITY	Acidity	8,200		ug/L
									ALKLNTY	Alkalinity	8,000		ug/L
									SB_T_R	Antimony, Total Recoverable	1.6		ug/L
									AS_T_R	Arsenic, Total Recoverable	1.2		ug/L
									BA_T_R	Barium, Total Recoverable	42.8		ug/L
									CD_T_R	Cadmium, Total Recoverable	0.11		ug/L
									CR_T_R	Chromium, Total Recoverable	0.78		ug/L
									CU_T_R	Copper, Total Recoverable	11.8		ug/L
									FE_T_R	Iron, Total Recoverable	356 J	J	ug/L
									PB_T_R	Lead, Total Recoverable	5.1		ug/L
									MN_T_R	Manganese, Total	5.5		ug/L
									NI_T_R	Nickel, Total Recoverable	0.72		ug/L
									AG_T_R	Silver, Total Recoverable	ND(0.5)		ug/L
									TDS	Solids, Total Dissolved	34,000		ug/L
									TSS	Solids, Total Suspended	ND(2,000)		ug/L
									SULFATE	Sulfate	2,800		ug/L
									ZN_T_R	Zinc, Total Recoverable	6.1		ug/L
									FLOW	Flow	21811.68		gpm
									O2_DIS	Oxygen, Dissolved	8,500		ug/L
									PH	pH	6.61		Std Units
									SPCON_F	Conductance Field	24		umhos/cm
									TEMP	Temperature	7.9		oC
			10160853	10160853005					HG_T_R	Mercury, Total Recoverable	0.12		ug/L
CML-SW-17	CML-SW-17	CML-SW-17	10160673	10160673005	6/14/2011	Water	988827.6611	832147.2885	ACIDITY	Acidity	15,800		ug/L
									ALKLNTY	Alkalinity	ND(5,000)		ug/L
									SB_T_R	Antimony, Total Recoverable	ND(0.5)		ug/L
									AS_T_R	Arsenic, Total Recoverable	ND(0.5)		ug/L
									BA_T_R	Barium, Total Recoverable	8.7		ug/L
									CD_T_R	Cadmium, Total Recoverable	ND(0.08)		ug/L
									CR_T_R	Chromium, Total Recoverable	ND(0.5)		ug/L
									CU_T_R	Copper, Total Recoverable	2.4		ug/L
									FE_T_R	Iron, Total Recoverable	115		ug/L
									PB_T_R	Lead, Total Recoverable	0.13/ND(0.13)U	U	ug/L
									MN_T_R	Manganese, Total	1.7		ug/L
									NI_T_R	Nickel, Total Recoverable	ND(0.5)		ug/L
									AG_T_R	Silver, Total Recoverable	ND(0.5)		ug/L
									TDS	Solids, Total Dissolved	42,000		ug/L
									TSS	Solids, Total Suspended	ND(1,000)		ug/L
									SULFATE	Sulfate	4,400		ug/L
									ZN_T_R	Zinc, Total Recoverable	12.5		ug/L
									FLOW	Flow	2939.64		gpm
									O2_DIS	Oxygen, Dissolved	NM		mg/L
									PH	pH	NM		Std Units
									SPCON_F	Conductance Field	NM		umhos/cm
									TEMP	Temperature	NM		oC
			10160851	10160851001					HG_T_R	Mercury, Total Recoverable	0.0056		ug/L

APPENDIX B-9. SURFACE WATER-MATRIX ANALYTICAL RESULTS
COMBINATION MILL AOC
BLACK PINE MINE

Location	Sample ID	Field Sample ID	Lab Batch ID	Lab Sample ID	Date Sampled	Matrix	X	Y	Tri Cas	Analyte[a]	Value	Reviewer Qualifier	Units
CML-SW-18	CML-SW-18	CML-SW-18	10160673	10160673006	6/14/2011	Water	987816.7525	836602.6021	ACIDITY	Acidity	ND(5,000)		ug/L
									ALKLNTY	Alkalinity	5,400		ug/L
									SB_T_R	Antimony, Total Recoverable	ND(0.5)		ug/L
									AS_T_R	Arsenic, Total Recoverable	ND(0.5)		ug/L
									BA_T_R	Barium, Total Recoverable	20.4		ug/L
									CD_T_R	Cadmium, Total Recoverable	ND(0.08)		ug/L
									CR_T_R	Chromium, Total Recoverable	ND(0.5)		ug/L
									CU_T_R	Copper, Total Recoverable	2		ug/L
									FE_T_R	Iron, Total Recoverable	158		ug/L
									PB_T_R	Lead, Total Recoverable	0.27/ND(0.27)U	U	ug/L
									MN_T_R	Manganese, Total	1		ug/L
									NI_T_R	Nickel, Total Recoverable	ND(0.5)		ug/L
									AG_T_R	Silver, Total Recoverable	ND(0.5)		ug/L
									TDS	Solids, Total Dissolved	53,000		ug/L
									TSS	Solids, Total Suspended	ND(2,000)		ug/L
									SULFATE	Sulfate	2,700		ug/L
									ZN_T_R	Zinc, Total Recoverable	ND(5)		ug/L
									FLOW	Flow	44.88		gpm
									O2_DIS	Oxygen, Dissolved	NM		mg/L
									PH	pH	NM		Std Units
									SPCON_F	Conductance Field	NM		umhos/cm
									TEMP	Temperature	NM		oC
			10160853	10160853008					HG_T_R	Mercury, Total Recoverable	0.0071		ug/L

APPENDIX B-9. SURFACE WATER-MATRIX ANALYTICAL RESULTS
COMBINATION MILL AOC
BLACK PINE MINE

Location	Sample ID	Field Sample ID	Lab Batch ID	Lab Sample ID	Date Sampled	Matrix	X	Y	Tri Cas	Analyte[a]	Value	Reviewer Qualifier	Units
CML-SW-19	CML-SW-19	CML-SW-19	10160756	10160756002	6/15/2011	Water	987941.839	827186.254	ACIDITY	Acidity	10,100		ug/L
									ALKLNTY	Alkalinity	7,600		ug/L
									SB_T_R	Antimony, Total Recoverable	ND(0.5)		ug/L
									AS_T_R	Arsenic, Total Recoverable	ND(0.5)		ug/L
									BA_T_R	Barium, Total Recoverable	44.6		ug/L
									CD_T_R	Cadmium, Total Recoverable	ND(0.08)		ug/L
									CR_T_R	Chromium, Total Recoverable	0.69		ug/L
									CU_T_R	Copper, Total Recoverable	3.6		ug/L
									FE_T_R	Iron, Total Recoverable	308 J	J	ug/L
									PB_T_R	Lead, Total Recoverable	0.37/ND(0.37)U	U	ug/L
									MN_T_R	Manganese, Total	4.1		ug/L
									NI_T_R	Nickel, Total Recoverable	0.61		ug/L
									AG_T_R	Silver, Total Recoverable	ND(0.5)	UJ	ug/L
									TDS	Solids, Total Dissolved	32,000		ug/L
									TSS	Solids, Total Suspended	1,300		ug/L
									SULFATE	Sulfate	2,400		ug/L
									ZN_T_R	Zinc, Total Recoverable	ND(5)		ug/L
									FLOW	Flow	19612.56		gpm
									O2_DIS	Oxygen, Dissolved	10,700		ug/L
									PH	pH	7.37		Std Units
									SPCON_F	Conductance Field	18		umhos/cm
									TEMP	Temperature	6.4		oC
			10160853	10160853015					HG_T_R	Mercury, Total Recoverable	0.0062		ug/L

[a] Silver was included in original laboratory analytical reports, but was removed in revised reports by the laboratory

J – Estimated concentration
JB – Estimated concentration due to blank contamination
U – Evaluated to be undetected at the reporting limit
UJ – Estimated reporting limit
oC - degrees Celsius
gpm - gallons per minute
ug/L - micrograms per liter
umhos/cm - micro hmos per centimeter
Std Units - Standard units
ND() - Analyte was not detected (reporting limit)

APPENDIX B10

RCRA METALS ANALYTICAL RESULTS, COMBINATION MILL AOC

APPENDIX B-10. RCRA METALS ANALYTICAL RESULTS
COMBINATION MILL AOC
BLACK PINE MINE

Location	Sample ID	Field Sample ID	Lab Batch ID	Lab Sample ID	Date Sampled	Matrix	Tri Cas	Analyte	Value	Reviewer	Units
CML-RCRA-01	CML-RCRA-01	BP-CML-RCRA-01	10166973	10166973006	8/17/2011	Soil	MOISTURE	Soil Moisture	0.19		%
							AS	Arsenic, Total	63.3		mg/kg
							BA	Barium, Total	197		mg/kg
							CD	Cadmium, Total	0.62		mg/kg
							CR	Chromium, Total	54.1		mg/kg
							CO_T_R	Cobalt, Total Recoverable	7.1 J	J	mg/kg
							PB	Lead, Total	164		mg/kg
							HG_T_R	Mercury, Total Recoverable	0.51		mg/kg
							SE	Selenium, Total	ND(0.48)		mg/kg
							AG	Silver, Total	3.3		mg/kg
CML-RCRA-02	CML-RCRA-02	BP-CML-RCRA-02	10166973	10166973007	8/17/2011	Soil	MOISTURE	Soil Moisture	6		%
							AS	Arsenic, Total	680		mg/kg
							BA	Barium, Total	191		mg/kg
							CD	Cadmium, Total	14.9		mg/kg
							CR	Chromium, Total	1.6		mg/kg
							CO_T_R	Cobalt, Total Recoverable	0.7 J	J	mg/kg
							PB	Lead, Total	2640		mg/kg
							HG_T_R	Mercury, Total Recoverable	5		mg/kg
							SE	Selenium, Total	0.56		mg/kg
							AG	Silver, Total	59.7		mg/kg
CML-RCRA-03	CML-RCRA-03	BP-CML-RCRA-03	10166973	10166973008	8/17/2011	Soil	MOISTURE	Soil Moisture	5.1		%
							AS	Arsenic, Total	12.7		mg/kg
							BA	Barium, Total	19.5		mg/kg
							CD	Cadmium, Total	0.88		mg/kg
							CR	Chromium, Total	ND(0.49)		mg/kg
							CO_T_R	Cobalt, Total Recoverable	ND(0.49)		mg/kg
							PB	Lead, Total	151		mg/kg
							HG_T_R	Mercury, Total Recoverable	4.4		mg/kg
							SE	Selenium, Total	ND(0.49)		mg/kg
							AG	Silver, Total	8.2		mg/kg
CML-RCRA-04	CML-RCRA-04	BP-CML-RCRA-04	10166973	10166973009	8/17/2011	Soil	MOISTURE	Soil Moisture	0.13		%
							AS	Arsenic, Total	138		mg/kg
							BA	Barium, Total	547		mg/kg
							CD	Cadmium, Total	1.7		mg/kg
							CR	Chromium, Total	33		mg/kg
							CO_T_R	Cobalt, Total Recoverable	4.8 J	J	mg/kg
							PB	Lead, Total	222		mg/kg
							HG_T_R	Mercury, Total Recoverable	1.7		mg/kg
							SE	Selenium, Total	ND(0.37)		mg/kg
							AG	Silver, Total	9		mg/kg

[a] Silver was included in original laboratory analytical reports, but was removed in revised reports by the laboratory

J – Estimated concentration

ft - feet

meq/100g - milliequivalents per hundred grams

mg/kg - milligrams per kilogram

mmhos/cm - micromhos per centimeter

% - percent

ND() - Analyte was not detected (reporting limit)

Std Units - Standard Units

t/1000t - tons per thousand tons

APPENDIX B11

QUALITY ASSURANCE/QUALITY CONTROL ANALYTICAL RESULTS

APPENDIX B-11. QUALITY ASSURANCE/QUALITY CONTROL ANALYTICAL RESULTS
BLACK PINE MINE

Location	Sample ID	Field Sample ID	Lab Batch ID	Lab Sample ID	Date Sampled	Matrix	X	Y	Tri Cas	Analyte[a]	Value	Reviewer Qualifier	Units
CML-SW-02	CML-SW-02 Dup	CML-Q1-T2	10160756	10160756004	6/15/2011	Water	988686.08	831557.87	SB_T_	Antimony, Total Recoverable	1.3 J	J	ug/L
									AS_T_	Arsenic, Total Recoverable	0.8 J	J	ug/L
									BA_T_	Barium, Total Recoverable	41.3		ug/L
									CD_T_	Cadmium, Total Recoverable	ND(0.08)		ug/L
									CR_T_	Chromium, Total Recoverable	1.1 J	J	ug/L
									CU_T_	Copper, Total Recoverable	9.9 J	J	ug/L
									FE_T_R	Iron, Total Recoverable	562 J	J	ug/L
									PB_T_	Lead, Total Recoverable	1 JB	JB	ug/L
									MN_T_	Manganese, Total Recoverable	6.8 J	J	ug/L
									AG_T_	Silver, Total Recoverable	ND(0.5)	UJ	ug/L
									ZN_T_	Zinc, Total Recoverable	5.9		ug/L
CML-SW-15	CML-SW-15 Dup	CML-Q1-T1	10160655	10160655007	6/15/2011	Water	988363.33	829506.22	SB_T_	Antimony, Total Recoverable	ND(0.5)		ug/L
									AS_T_	Arsenic, Total Recoverable	0.65		ug/L
									BA_T_	Barium, Total Recoverable	43.4		ug/L
									CD_T_	Cadmium, Total Recoverable	ND(0.08)		ug/L
									CR_T_	Chromium, Total Recoverable	0.79		ug/L
									CU_T_	Copper, Total Recoverable	6		ug/L
									FE_T_R	Iron, Total Recoverable	340 J	J	ug/L
									PB_T_	Lead, Total Recoverable	0.63 JB	JB	ug/L
									MN_T_	Manganese, Total Recoverable	5.8		ug/L
									NI_T_R	Nickel, Total Recoverable	0.75		ug/L
									AG_T_	Silver, Total Recoverable	ND(0.5)		ug/L
									ZN_T_	Zinc, Total Recoverable	5.2		ug/L
CMMW-1	CMMW-1 Dup	FIELD DUPLICATE	10156716	10156716010	5/5/2011	Water	995873.64	822600.34	ALKLNTY	Alkalinity	48,100		ug/L
									DAS	Arsenic, Dissolved	1.2		ug/L
									DCD	Cadmium, Dissolved	0.1		ug/L
									DCA	Calcium, Dissolved	7,020		ug/L
									DCU	Copper, Dissolved	0.93 J	J	ug/L
									DFE	Iron, Dissolved	73 J	J	ug/L
									DPB	Lead, Dissolved	0.15 J	J	ug/L
									DMG	Magnesium, Dissolved	3,840		ug/L
									DMN	Manganese, Dissolved	3.6 J	J	ug/L
									DK	Potassium, Dissolved	864 J	J	ug/L
									DNA	Sodium, Dissolved	10,100		ug/L
									TDS	Solids, Total Dissolved	231,000 J	J	ug/L
									TSS	Solids, Total Suspended	3,810,000 J	J	ug/L
									SULFATE	Sulfate	2,800		ug/L
									DZN	Zinc, Dissolved	ND(5)		ug/L

APPENDIX B-11. QUALITY ASSURANCE/QUALITY CONTROL ANALYTICAL RESULTS
BLACK PINE MINE

Location	Sample ID	Field Sample ID	Lab Batch ID	Lab Sample ID	Date Sampled	Matrix	X	Y	Tri Cas	Analyte[a]	Value	Reviewer Qualifier	Units
Equipment Rinsate	Equipment Rinsate	BP-QC-WT-T1	10163606	10163606005	7/13/2011	Water			SB_T_	Antimony, Total Recoverable	ND(0.5)		ug/L
									AS_T_	Arsenic, Total Recoverable	ND(0.5)		ug/L
									BA_T_	Barium, Total Recoverable	ND(0.3)		ug/L
									CD_T_	Cadmium, Total Recoverable	ND(0.08)		ug/L
									CR_T_	Chromium, Total Recoverable	ND(0.5)		ug/L
									CU_T_	Copper, Total Recoverable	ND(0.5)		ug/L
									FE_T_R	Iron, Total Recoverable	ND(50)		ug/L
									PB_T_	Lead, Total Recoverable	0.47		ug/L
									MN_T_	Manganese, Total Recoverable	ND(0.5)		ug/L
									HG_T_	Mercury, Total Recoverable	ND(0.2)		ug/L
									NI_T_R	Nickel, Total Recoverable	ND(0.5)		ug/L
									AG_T_	Silver, Total Recoverable	ND(0.5)		ug/L
									ZN_T_	Zinc, Total Recoverable	ND(5)		ug/L
Field Blank	Field Blank	FIELD BLANK 2	10160853	10160853016	6/13/2011	Water			HG_T_	Mercury, Total Recoverable	ND(0.0005)		ug/L
					6/16/2011				HG_T_	Mercury, Total Recoverable	ND(0.0005)		ug/L
North Area Spring (N)	North Area Spring (N) Dup	BD-1	10158290	10158290010	5/19/2011	Water			ACIDIT	Acidity	44,100 J	J	ug/L
									ALKLN	Alkalinity	13,200		ug/L
									AS_T_	Arsenic, Total Recoverable	2		ug/L
									CD_T_	Cadmium, Total Recoverable	13.7		ug/L
									CA	Calcium, Total	13,600		ug/L
									CU_T_	Copper, Total Recoverable	700 J	J	ug/L
									FE_T_R	Iron, Total Recoverable	1,670 J	J	ug/L
									PB_T_	Lead, Total Recoverable	3.3		ug/L
									MG	Magnesium, Total	5,290 J	J	ug/L
									MN_T_	Manganese, Total Recoverable	118		ug/L
									K	Potassium, Total	2,030 J	J	ug/L
									NA	Sodium, Total	4,130 J	J	ug/L
									TDS	Solids, Total Dissolved	126,000		ug/L
									TSS	Solids, Total Suspended	25,800 J	J	ug/L
									SULFA	Sulfate	41,700 J	J	ug/L
									ZN_T_	Zinc, Total Recoverable	1,130 J	J	ug/L

[a] Silver was included in original laboratory analytical reports, but was removed in revised reports by the laboratory

J – Estimated concentration

JB – Estimated concentration due to blank contamination

UJ – Estimated reporting limit

ug/L - micrograms per liter

ND() - Analyte was not detected (reporting limit)

APPENDIX B12

SOLID MATRIX ANALYTICAL RESULTS, REPOSITORY

APPENDIX B-12. SOLID-MATRIX ANALYTICAL RESULTS
REPOSITORY
BLACK PINE MINE

Location	Sample ID	Field Sample ID	Lab Batch ID	Lab Sample ID	Date Sampled	Matrix	X	Y	Sample Start Depth	Sample End Depth	Tri Cas	Analyte	Value	Reviewer Qualifier	Units
MW-RY-06	MW-RY-06 (0-0.5 ft)	BP-RY-06-00	10166973	10166973001	8/16/2011	Soil	993985.181	825544.529	0	0.5	MOISTURE	Soil Moisture	8.7		%
											SB	Antimony, Total	5.5		mg/kg
											AS	Arsenic, Total	13.1		mg/kg
											BA	Barium, Total	122		mg/kg
											CD	Cadmium, Total	0.58		mg/kg
											CR	Chromium, Total	13.2		mg/kg
											CO_T_R	Cobalt, Total Recoverable	7.8 J	J	mg/kg
											CU	Copper, Total	219		mg/kg
											FE	Iron, Total	13300		mg/kg
											PB	Lead, Total	45.6		mg/kg
											MN	Manganese, Total	384		mg/kg
											HG_T_R	Mercury, Total Recoverable	0.026		mg/kg
											NI	Nickel, Total	12.3		mg/kg
											AG	Silver, Total	1.5		mg/kg
											ZN	Zinc, Total	53.9		mg/kg
MW-RY-06	MW-RY-06 (4-5 ft)	BP-RY-06-04	10166973	10166973002	8/16/2011	Soil	993985.181	825544.529	4	5	MOISTURE	Soil Moisture	14.9		%
											SB	Antimony, Total	0.86		mg/kg
											AS	Arsenic, Total	7.9		mg/kg
											BA	Barium, Total	105		mg/kg
											CD	Cadmium, Total	0.46		mg/kg
											CR	Chromium, Total	17.9		mg/kg
											CO_T_R	Cobalt, Total Recoverable	4.6 J	J	mg/kg
											CU	Copper, Total	310		mg/kg
											FE	Iron, Total	19300		mg/kg
											PB	Lead, Total	11.2		mg/kg
											MN	Manganese, Total	110		mg/kg
											HG_T_R	Mercury, Total Recoverable	0.097		mg/kg
											NI	Nickel, Total	15		mg/kg
											AG	Silver, Total	ND(0.56)		mg/kg
											ZN	Zinc, Total	57.4		mg/kg
MW-RY-07	MW-RY-07 (0-0.5 ft)	BP-RY-07-00	10166973	10166973003	8/17/2011	Soil	993855.987	825763.984	0	0.5	MOISTURE	Soil Moisture	6.2		%
											SB	Antimony, Total	0.98		mg/kg
											AS	Arsenic, Total	7.2		mg/kg
											BA	Barium, Total	216		mg/kg
											CD	Cadmium, Total	0.2		mg/kg
											CR	Chromium, Total	7.6		mg/kg
											CO_T_R	Cobalt, Total Recoverable	8.1 J	J	mg/kg
											CU	Copper, Total	6.4		mg/kg
											FE	Iron, Total	9880		mg/kg
											PB	Lead, Total	13.7		mg/kg
											MN	Manganese, Total	1840		mg/kg
											HG_T_R	Mercury, Total Recoverable	0.037		mg/kg
											NI	Nickel, Total	9.6		mg/kg
											AG	Silver, Total	ND(0.48)		mg/kg
											ZN	Zinc, Total	32		mg/kg

APPENDIX B-12. SOLID-MATRIX ANALYTICAL RESULTS
REPOSITORY
BLACK PINE MINE

Location	Sample ID	Field Sample ID	Lab Batch ID	Lab Sample ID	Date Sampled	Matrix	X	Y	Sample Start Depth	Sample End Depth	Tri Cas	Analyte	Value	Reviewer Qualifier	Units
MW-RY-07	MW-RY-07 (10-11 ft)	BP-RY-07-10	10166973	10166973004	8/17/2011	Soil	993855.987	825763.984	10	11	MOISTURE	Soil Moisture	15		%
											SB	Antimony, Total	1.1		mg/kg
											AS	Arsenic, Total	8.3		mg/kg
											BA	Barium, Total	114		mg/kg
											CD	Cadmium, Total	ND(0.078)		mg/kg
											CR	Chromium, Total	14.1		mg/kg
											CO_T_R	Cobalt, Total Recoverable	15.9 J	J	mg/kg
											CU	Copper, Total	16.4		mg/kg
											FE	Iron, Total	17300		mg/kg
											PB	Lead, Total	15.8		mg/kg
											MN	Manganese, Total	216		mg/kg
											HG_T_R	Mercury, Total Recoverable	0.065		mg/kg
											NI	Nickel, Total	14.9		mg/kg
											AG	Silver, Total	ND(0.49)		mg/kg
											ZN	Zinc, Total	27.2		mg/kg
MW-RY-08	MW-RY-08 (0-0.5 ft)	BP-RY-08-00	10166973	10166973005	8/17/2011	Soil	994616.414	825997.986	0	0.5	FRAG_COARSE	Coarse Fragments	63.7		%
											OM	Organic Matter	2.4		%
											MOISTURE	Soil Moisture	8		%
											SULFUR_EX_HCL	Sulfur (HCL Extraction)	ND(0.05)		%
											SULFUR_EX_HNO3	Sulfur (HNO3 Extraction)	ND(0.05)		%
											SULFUR_HOTWATER_HNO3	Sulfur (Hot Water Extraction)	ND(0.05)		%
											SULFUR_RES	Sulfur, Residual	ND(0.05)		%
											SULFUR	Sulfur, Total	ND(0.05)		%
											CEC	Cation Exchange Capacity	11.2		meq/100g
											SB	Antimony, Total	19.3		mg/kg
											AS	Arsenic, Total	52.1		mg/kg
											BA	Barium, Total	90.2		mg/kg
											CD	Cadmium, Total	0.35		mg/kg
											CR	Chromium, Total	3.6		mg/kg
											CO_T_R	Cobalt, Total Recoverable	1.7 J	J	mg/kg
											CU	Copper, Total	70.7		mg/kg
											FE	Iron, Total	9240		mg/kg
											PB	Lead, Total	217		mg/kg
											MN	Manganese, Total	146		mg/kg
											HG_T_R	Mercury, Total Recoverable	0.02		mg/kg
											NI	Nickel, Total	4.4		mg/kg
											N_NO3	Nitrogen, Nitrate	ND(5)		mg/kg
											P_AVAIL	Phosphorous, Available	2.8		mg/kg
											K	Potassium, Total	86 J	J	mg/kg
											AG	Silver, Total	0.83		mg/kg
											ZN	Zinc, Total	129		mg/kg
											SPCON_SATPASTE	Specific Conductance, Saturated Paste	0.27		mmhos/cm
											PH_SATPASTE	pH, Saturated Paste	7.5		Std Units
											PH_SMPBUFFER	pH, SMP Buffer	7		Std Units
											ACIDBASE_POT	Acid Base Potential	2.4		t/1000t
											ACIDITY_POT	Acid Potential	ND(4.3)		t/1000t
											NEUT_POT	Neutralization Potential	2.4		t/1000t
											01305-78-8_REC	Recommended Lime	ND(5.4)		t/1000t
											SMPLIME_REQ	SMP Lime Requirement	0		t/1000t

APPENDIX B-12. SOLID-MATRIX ANALYTICAL RESULTS
REPOSITORY
BLACK PINE MINE

Location	Sample ID	Field Sample ID	Lab Batch ID	Lab Sample ID	Date Sampled	Matrix	X	Y	Sample Start Depth	Sample End Depth	Tri Cas	Analyte	Value	Reviewer Qualifier	Units
RY-SS-01	RY-SS-01 (0-1 ft)	BP-RY-SS-01-00	10163246	10163246002	7/12/2011	Soil	993940.974	823455.118	0	1	FRAG_COARSE	Coarse Fragments	67.1		%
											OM	Organic Matter	3.3		%
											MOISTURE	Soil Moisture	8.4		%
											SULFUR_EX_HCL	Sulfur (HCL Extraction)	ND(0.05)		%
											SULFUR_EX_HNO3	Sulfur (HNO3 Extraction)	ND(0.05)		%
											SULFUR_HOTWATER_HNO3	Sulfur (Hot Water Extraction)	ND(0.05)		%
											SULFUR_RES	Sulfur, Residual	ND(0.05)		%
											SULFUR	Sulfur, Total	ND(0.05)		%
											CEC	Cation Exchange Capacity	32.3		meq/100g
											SB_T_R	Antimony, Total Recoverable	0.48		mg/kg
											AS_T_R	Arsenic, Total Recoverable	4		mg/kg
											BA_T_R	Barium, Total Recoverable	284		mg/kg
											CD_T_R	Cadmium, Total Recoverable	0.093		mg/kg
											CR_T_R	Chromium, Total Recoverable	6.8		mg/kg
											CO_T_R	Cobalt, Total Recoverable	4.3		mg/kg
											CU_T_R	Copper, Total Recoverable	5.1		mg/kg
											FE_T_R	Iron, Total Recoverable	11800		mg/kg
											PB_T_R	Lead, Total Recoverable	6.8		mg/kg
											MN_T_R	Manganese, Total Recoverable	327		mg/kg
											HG_T_R	Mercury, Total Recoverable	0.025 J	J	mg/kg
											NI_T_R	Nickel, Total Recoverable	13.6		mg/kg
											N_NO3	Nitrogen, Nitrate	ND(5)		mg/kg
											P_AVAIL	Phosphorous, Available	18.1		mg/kg
											K	Potassium, Total	ND(277)		mg/kg
											AG_T_R	Silver, Total Recoverable	ND(0.37)		mg/kg
											ZN_T_R	Zinc, Total Recoverable	36.8		mg/kg
											SPCON_SATPASTE	Specific Conductance, Saturated Paste	0.17 J	J	mmhos/cm
											PH_SATPASTE	pH, Saturated Paste	7.1		Std Units
											PH_SMPBUFFER	pH, SMP Buffer	6.3		Std Units
											ACIDBASE_POT	Acid Base Potential	8.2		t/1000t
											ACIDITY_POT	Acid Potential	ND(4.3)		t/1000t
											NEUT_POT	Neutralization Potential	8.2		t/1000t
											01305-78-8_REC	Recommended Lime	6.3		t/1000t
											SMPLIME_REQ	SMP Lime Requirement	4.6		t/1000t

APPENDIX B-12. SOLID-MATRIX ANALYTICAL RESULTS
REPOSITORY
BLACK PINE MINE

Location	Sample ID	Field Sample ID	Lab Batch ID	Lab Sample ID	Date Sampled	Matrix	X	Y	Sample Start Depth	Sample End Depth	Tri Cas	Analyte	Value	Reviewer Qualifier	Units
RY-SS-02	RY-SS-02 (0-1 ft)	BP-RY-SS-02-00	10163246	10163246001	7/12/2011	Soil	994401.456	823444.65	0	1	FRAG_COARSE	Coarse Fragments	50.4		%
											OM	Organic Matter	8.7		%
											MOISTURE	Soil Moisture	6.6		%
											SULFUR_EX_HCL	Sulfur (HCL Extraction)	ND(0.05)		%
											SULFUR_EX_HNO3	Sulfur (HNO3 Extraction)	ND(0.05)		%
											SULFUR_HOTWATER_HNO3	Sulfur (Hot Water Extraction)	ND(0.05)		%
											SULFUR_RES	Sulfur, Residual	ND(0.05)		%
											SULFUR	Sulfur, Total	ND(0.05)		%
											CEC	Cation Exchange Capacity	49.8		meq/100g
											SB_T_R	Antimony, Total Recoverable	0.6		mg/kg
											AS_T_R	Arsenic, Total Recoverable	7.2		mg/kg
											BA_T_R	Barium, Total Recoverable	248		mg/kg
											CD_T_R	Cadmium, Total Recoverable	0.31		mg/kg
											CR_T_R	Chromium, Total Recoverable	4.4		mg/kg
											CO_T_R	Cobalt, Total Recoverable	3.3		mg/kg
											CU_T_R	Copper, Total Recoverable	5.7		mg/kg
											FE_T_R	Iron, Total Recoverable	6090		mg/kg
											PB_T_R	Lead, Total Recoverable	5.4		mg/kg
											MN_T_R	Manganese, Total Recoverable	782		mg/kg
											HG_T_R	Mercury, Total Recoverable	0.14 J	J	mg/kg
											NI_T_R	Nickel, Total Recoverable	8.5		mg/kg
											N_NO3	Nitrogen, Nitrate	ND(5)		mg/kg
											P_AVAIL	Phosphorous, Available	22		mg/kg
											K	Potassium, Total	ND(568)		mg/kg
											AG_T_R	Silver, Total Recoverable	ND(0.45)		mg/kg
											ZN_T_R	Zinc, Total Recoverable	42.7		mg/kg
											SPCON_SATPASTE	Specific Conductance, Saturated Paste	0.33 J	J	mmhos/cm
											PH_SATPASTE	pH, Saturated Paste	7.8		Std Units
											PH_SMPBUFFER	pH, SMP Buffer	7		Std Units
											ACIDBASE_POT	Acid Base Potential	124		t/1000t
											ACIDITY_POT	Acid Potential	ND(4.3)		t/1000t
											NEUT_POT	Neutralization Potential	125		t/1000t
											01305-78-8_REC	Recommended Lime	ND(5.4)		t/1000t
											SMPLIME_REQ	SMP Lime Requirement	0		t/1000t

APPENDIX B-12. SOLID-MATRIX ANALYTICAL RESULTS
REPOSITORY
BLACK PINE MINE

Location	Sample ID	Field Sample ID	Lab Batch ID	Lab Sample ID	Date Sampled	Matrix	X	Y	Sample Start Depth	Sample End Depth	Tri Cas	Analyte	Value	Reviewer Qualifier	Units
RY-SS-02	RY-SS-02 (2-4 ft)	BP-RY-SS-02-02	10163246	10163246005	7/12/2011	Soil	994401.456	823444.65	2	4	FRAG_COARSE	Coarse Fragments	27.3		%
											OM	Organic Matter	3.4		%
											MOISTURE	Soil Moisture	21.6		%
											SULFUR_EX_HCL	Sulfur (HCL Extraction)	ND(0.05)		%
											SULFUR_EX_HNO3	Sulfur (HNO3 Extraction)	ND(0.05)		%
											SULFUR_HOTWATER_HNO3	Sulfur (Hot Water Extraction)	ND(0.05)		%
											SULFUR_RES	Sulfur, Residual	ND(0.05)		%
											SULFUR	Sulfur, Total	ND(0.05)		%
											CEC	Cation Exchange Capacity	35.5		meq/100g
											SB_T_R	Antimony, Total Recoverable	0.5		mg/kg
											AS_T_R	Arsenic, Total Recoverable	7.8		mg/kg
											BA_T_R	Barium, Total Recoverable	239		mg/kg
											CD_T_R	Cadmium, Total Recoverable	ND(0.078)		mg/kg
											CR_T_R	Chromium, Total Recoverable	12.9		mg/kg
											CO_T_R	Cobalt, Total Recoverable	5.1		mg/kg
											CU_T_R	Copper, Total Recoverable	8.9		mg/kg
											FE_T_R	Iron, Total Recoverable	20400		mg/kg
											PB_T_R	Lead, Total Recoverable	11.8		mg/kg
											MN_T_R	Manganese, Total Recoverable	192		mg/kg
											HG_T_R	Mercury, Total Recoverable	ND(0.024)	UJ	mg/kg
											NI_T_R	Nickel, Total Recoverable	13		mg/kg
											N_NO3	Nitrogen, Nitrate	ND(5)		mg/kg
											P_AVAIL	Phosphorous, Available	14.7		mg/kg
											K	Potassium, Total	ND(124)		mg/kg
											AG_T_R	Silver, Total Recoverable	ND(0.49)		mg/kg
											ZN_T_R	Zinc, Total Recoverable	36.9		mg/kg
											SPCON_SATPASTE	Specific Conductance, Saturated Paste	0.12 J	J	mmhos/cm
											PH_SATPASTE	pH, Saturated Paste	7		Std Units
											PH_SMPBUFFER	pH, SMP Buffer	5.8		Std Units
											ACIDBASE_POT	Acid Base Potential	6.2		t/1000t
											ACIDITY_POT	Acid Potential	ND(4.3)		t/1000t
											NEUT_POT	Neutralization Potential	6.2		t/1000t
											01305-78-8_REC	Recommended Lime	8.2		t/1000t
											SMPLIME_REQ	SMP Lime Requirement	5.9		t/1000t

APPENDIX B-12. SOLID-MATRIX ANALYTICAL RESULTS
REPOSITORY
BLACK PINE MINE

Location	Sample ID	Field Sample ID	Lab Batch ID	Lab Sample ID	Date Sampled	Matrix	X	Y	Sample Start Depth	Sample End Depth	Tri Cas	Analyte	Value	Reviewer Qualifier	Units
RY-SS-03	RY-SS-03 (0-1 ft)	BP-RY-SS-03-00	10163246	10163246003	7/12/2011	Soil	994320.552	825228.684	0	1	FRAG_COARSE	Coarse Fragments	83.9		%
											OM	Organic Matter	0.35		%
											MOISTURE	Soil Moisture	10.5		%
											SULFUR_EX_HCL	Sulfur (HCL Extraction)	ND(0.05)		%
											SULFUR_EX_HNO3	Sulfur (HNO3 Extraction)	ND(0.05)		%
											SULFUR_HOTWATER_HNO3	Sulfur (Hot Water Extraction)	ND(0.05)		%
											SULFUR_RES	Sulfur, Residual	ND(0.05)		%
											SULFUR	Sulfur, Total	ND(0.05)		%
											CEC	Cation Exchange Capacity	14.1		meq/100g
											SB_T_R	Antimony, Total Recoverable	2.4		mg/kg
											AS_T_R	Arsenic, Total Recoverable	8.4		mg/kg
											BA_T_R	Barium, Total Recoverable	202		mg/kg
											CD_T_R	Cadmium, Total Recoverable	0.14		mg/kg
											CR_T_R	Chromium, Total Recoverable	10.1		mg/kg
											CO_T_R	Cobalt, Total Recoverable	8.7		mg/kg
											CU_T_R	Copper, Total Recoverable	12.9		mg/kg
											FE_T_R	Iron, Total Recoverable	17900		mg/kg
											PB_T_R	Lead, Total Recoverable	20.4		mg/kg
											MN_T_R	Manganese, Total Recoverable	399		mg/kg
											HG_T_R	Mercury, Total Recoverable	0.062 J	J	mg/kg
											NI_T_R	Nickel, Total Recoverable	12		mg/kg
											N_NO3	Nitrogen, Nitrate	ND(5)		mg/kg
											P_AVAIL	Phosphorous, Available	7.1		mg/kg
											K	Potassium, Total	ND(174)		mg/kg
											AG_T_R	Silver, Total Recoverable	ND(0.55)		mg/kg
											ZN_T_R	Zinc, Total Recoverable	37.2		mg/kg
											SPCON_SATPASTE	Specific Conductance, Saturated Paste	0.067 J	J	mmhos/cm
											PH_SATPASTE	pH, Saturated Paste	7		Std Units
											PH_SMPBUFFER	pH, SMP Buffer	6.8		Std Units
											ACIDBASE_POT	Acid Base Potential	6.5		t/1000t
											ACIDITY_POT	Acid Potential	ND(4.3)		t/1000t
											NEUT_POT	Neutralization Potential	6.5		t/1000t
											01305-78-8_REC	Recommended Lime	ND(5.4)		t/1000t
											SMPLIME_REQ	SMP Lime Requirement	0.3		t/1000t

APPENDIX B-12. SOLID-MATRIX ANALYTICAL RESULTS
REPOSITORY
BLACK PINE MINE

Location	Sample ID	Field Sample ID	Lab Batch ID	Lab Sample ID	Date Sampled	Matrix	X	Y	Sample Start Depth	Sample End Depth	Tri Cas	Analyte	Value	Reviewer Qualifier	Units
RY-SS-03	RY-SS-03 (14-16 ft)	BP-RY-SS-03-14	10163246	10163246004	7/12/2011	Soil	994320.552	825228.684	12	14	FRAG_COARSE	Coarse Fragments	22.3		%
											OM	Organic Matter	ND(0.1)		%
											MOISTURE	Soil Moisture	11.6		%
											SULFUR_EX_HCL	Sulfur (HCL Extraction)	ND(0.05)		%
											SULFUR_EX_HNO3	Sulfur (HNO3 Extraction)	ND(0.05)		%
											SULFUR_HOTWATER_HNO3	Sulfur (Hot Water Extraction)	ND(0.05)		%
											SULFUR_RES	Sulfur, Residual	ND(0.05)		%
											SULFUR	Sulfur, Total	ND(0.05)		%
											CEC	Cation Exchange Capacity	11.7		meq/100g
											SB_T_R	Antimony, Total Recoverable	1.8		mg/kg
											AS_T_R	Arsenic, Total Recoverable	11.3		mg/kg
											BA_T_R	Barium, Total Recoverable	132		mg/kg
											CD_T_R	Cadmium, Total Recoverable	0.089		mg/kg
											CR_T_R	Chromium, Total Recoverable	5.1		mg/kg
											CO_T_R	Cobalt, Total Recoverable	4.7		mg/kg
											CU_T_R	Copper, Total Recoverable	7.6		mg/kg
											FE_T_R	Iron, Total Recoverable	13000		mg/kg
											PB_T_R	Lead, Total Recoverable	12.9		mg/kg
											MN_T_R	Manganese, Total Recoverable	153		mg/kg
											HG_T_R	Mercury, Total Recoverable	0.069 J	J	mg/kg
											NI_T_R	Nickel, Total Recoverable	6.7		mg/kg
											N_NO3	Nitrogen, Nitrate	ND(5)		mg/kg
											P_AVAIL	Phosphorous, Available	2.8		mg/kg
											K	Potassium, Total	158		mg/kg
											AG_T_R	Silver, Total Recoverable	ND(0.38)		mg/kg
											ZN_T_R	Zinc, Total Recoverable	15.9		mg/kg
											SPCON_SATPASTE	Specific Conductance, Saturated Paste	0.091 J	J	mmhos/cm
											PH_SATPASTE	pH, Saturated Paste	7		Std Units
											PH_SMPBUFFER	pH, SMP Buffer	7		Std Units
											ACIDBASE_POT	Acid Base Potential	3.7		t/1000t
											ACIDITY_POT	Acid Potential	ND(4.3)		t/1000t
											NEUT_POT	Neutralization Potential	3.7		t/1000t
											01305-78-8_REC	Recommended Lime	ND(5.4)		t/1000t
											SMPLIME_REQ	SMP Lime Requirement	0		t/1000t

APPENDIX B-12. SOLID-MATRIX ANALYTICAL RESULTS
REPOSITORY
BLACK PINE MINE

Location	Sample ID	Field Sample ID	Lab Batch ID	Lab Sample ID	Date Sampled	Matrix	X	Y	Sample Start Depth	Sample End Depth	Tri Cas	Analyte	Value	Reviewer Qualifier	Units
RY-SS-04	RY-SS-04 (0-1 ft)	BP-RY-SS-04-00	10163246	10163246006	7/12/2011	Soil	994247.532	826012.278	0	1	FRAG_COARSE	Coarse Fragments	54.6		%
											OM	Organic Matter	3.1		%
											MOISTURE	Soil Moisture	14.7		%
											SULFUR_EX_HCL	Sulfur (HCL Extraction)	ND(0.05)		%
											SULFUR_EX_HNO3	Sulfur (HNO3 Extraction)	ND(0.05)		%
											SULFUR_HOTWATER_HNO3	Sulfur (Hot Water Extraction)	ND(0.05)		%
											SULFUR_RES	Sulfur, Residual	ND(0.05)		%
											SULFUR	Sulfur, Total	ND(0.05)		%
											CEC	Cation Exchange Capacity	21.1		meq/100g
											SB_T_R	Antimony, Total Recoverable	158		mg/kg
											AS_T_R	Arsenic, Total Recoverable	74.7		mg/kg
											BA_T_R	Barium, Total Recoverable	247		mg/kg
											CD_T_R	Cadmium, Total Recoverable	2.4		mg/kg
											CR_T_R	Chromium, Total Recoverable	3.4		mg/kg
											CO_T_R	Cobalt, Total Recoverable	4.0		mg/kg
											CU_T_R	Copper, Total Recoverable	82.5		mg/kg
											FE_T_R	Iron, Total Recoverable	16000		mg/kg
											PB_T_R	Lead, Total Recoverable	1030		mg/kg
											MN_T_R	Manganese, Total Recoverable	1300		mg/kg
											HG_T_R	Mercury, Total Recoverable	ND(0.021)	UJ	mg/kg
											NI_T_R	Nickel, Total Recoverable	8.3		mg/kg
											N_NO3	Nitrogen, Nitrate	ND(5)		mg/kg
											P_AVAIL	Phosphorous, Available	5.3		mg/kg
											K	Potassium, Total	ND(180)		mg/kg
											AG_T_R	Silver, Total Recoverable	2.7		mg/kg
											ZN_T_R	Zinc, Total Recoverable	141		mg/kg
											SPCON_SATPASTE	Specific Conductance, Saturated Paste	0.14 J	J	mmhos/cm
											PH_SATPASTE	pH, Saturated Paste	7		Std Units
											PH_SMPBUFFER	pH, SMP Buffer	6.2		Std Units
											ACIDBASE_POT	Acid Base Potential	7		t/1000t
											ACIDITY_POT	Acid Potential	ND(4.3)		t/1000t
											NEUT_POT	Neutralization Potential	7		t/1000t
											01305-78-8_REC	Recommended Lime	7		t/1000t
											SMPLIME_REQ	SMP Lime Requirement	5.3		t/1000t

APPENDIX C

LABORATORY ANALYTICAL REPORTS

C1 REVISED LABORATORY ANALYTICAL REPORTS
C2 ORIGINAL LABORATORY ANALYTICAL REPORTS

APPENDIX C1

REVISED LABORATORY ANALYTICAL REPORTS

Pace Analytical Services, Inc.
602 S 25th Street
Billings, MT 591014549
(406)254-7226

May 25, 2011

Kevin Houck
Herrera Environmental Consultants
101 East Broadway, Suite 610
Missoula, MT 59802

RE: Project: Black Pine Mine
Pace Project No.: 10156716

Dear Kevin Houck:
Enclosed are the analytical results for sample(s) received by the laboratory on May 07, 2011. The results relate only to the samples included in this report.

If you have any questions concerning this report, please feel free to contact me.

Sincerely,

Denise Jensen

denise.jensen@pacelabs.com
Project Manager

Enclosures

cc: Devin Clary, Montana Dept. of Environmental Quality

REPORT OF LABORATORY ANALYSIS

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Pace Analytical Services, Inc.
602 S 25th Street
Billings, MT 591014549
(406)254-7226

CERTIFICATIONS

Project: Black Pine Mine
Pace Project No.: 10156716

Minnesota Certification IDs

1700 Elm Street SE Suite 200, Minneapolis, MN 55414
A2LA Certification #: 2926.01
Alaska Certification #: UST-078
Alaska Certification #MN00064
Arizona Certification #: AZ-0014
Arkansas Certification #: 88-0680
California Certification #: 01155CA
EPA Region 8 Certification #: Pace
Florida/NELAP Certification #: E87605
Georgia Certification #: 959
Idaho Certification #: MN00064
Illinois Certification #: 200011
Iowa Certification #: 368
Kansas Certification #: E-10167
Louisiana Certification #: 03086
Louisiana Certification #: LA080009
Maine Certification #: 2007029
Maryland Certification #: 322
Michigan DEQ Certification #: 9909
Minnesota Certification #: 027-053-137
Mississippi Certification #: Pace
Montana Certification #: MT CERT0092
Nebraska Certification #: Pace
Nevada Certification #: MN_00064
New Jersey Certification #: MN-002
New Mexico Certification #: Pace
New York Certification #: 11647
North Carolina Certification #: 530
North Dakota Certification #: R-036
North Dakota Certification #: R-036A
Ohio VAP Certification #: CL101
Oklahoma Certification #: D9921
Oklahoma Certification #: 9507
Oregon Certification #: MN200001
Pennsylvania Certification #: 68-00563
Puerto Rico Certification
Tennessee Certification #: 02818
Texas Certification #: T104704192
Washington Certification #: C754
Wisconsin Certification #: 999407970

Montana Certification IDs

602 South 25th Street, Billings, MT 59101
EPA Region 8 Certification #: 8TMS-Q
Idaho Certification #: MT00012
Montana Certification #: MT CERT0040
NVLAP Certification #: 101292-0
Minnesota Dept of Health Certification #: 030-999-442

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Billings, MT 591014549
(406)254-7226

SAMPLE SUMMARY

Project: Black Pine Mine
Pace Project No.: 10156716

Lab ID	Sample ID	Matrix	Date Collected	Date Received
10156716001	**CMMW-1**	Water	05/05/11 17:00	05/07/11 10:00
10156716002	**CMMW-2**	Water	05/05/11 17:30	05/07/11 10:00
10156716003	**CMMW-3**	Water	05/05/11 15:40	05/07/11 10:00
10156716004	**CMMW-4**	Water	05/05/11 16:10	05/07/11 10:00
10156716005	**CMMW-5**	Water	05/05/11 18:00	05/07/11 10:00
10156716006	**CMMW-6**	Water	05/05/11 18:50	05/07/11 10:00
10156716007	**CMMW-7**	Water	05/05/11 14:50	05/07/11 10:00
10156716008	**CMMW-8**	Water	05/05/11 14:10	05/07/11 10:00
10156716009	**CMMW-9**	Water	05/05/11 16:30	05/07/11 10:00
10156716010	**FIELD DUPLICATE**	Water	05/05/11 00:00	05/07/11 10:00

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SAMPLE ANALYTE COUNT

Project: Black Pine Mine
Pace Project No.: 10156716

Lab ID	Sample ID	Method	Analysts	Analytes Reported	Laboratory
10156716001	**CMMW-1**	EPA 200.8	RJS	11	PASI-M
		SM 2540D	MP3	1	PASI-MT
		EPA 300.0	JH1	1	PASI-MT
		SM 2320B	MWD	1	PASI-M
		SM 2540C	CAP	1	PASI-M
10156716002	**CMMW-2**	EPA 200.8	RJS	11	PASI-M
		SM 2540D	MP3	1	PASI-MT
		EPA 300.0	JH1	1	PASI-MT
		SM 2320B	MWD	1	PASI-M
		SM 2540C	CAP	1	PASI-M
10156716003	**CMMW-3**	EPA 200.8	RJS	11	PASI-M
		SM 2540D	MP3	1	PASI-MT
		EPA 300.0	JH1	1	PASI-MT
		SM 2320B	MWD	1	PASI-M
		SM 2540C	CAP	1	PASI-M
10156716004	**CMMW-4**	EPA 200.8	RJS	11	PASI-M
		SM 2540D	MP3	1	PASI-MT
		EPA 300.0	JH1	1	PASI-MT
		SM 2320B	MWD	1	PASI-M
		SM 2540C	CAP	1	PASI-M
10156716005	**CMMW-5**	EPA 200.8	RJS	11	PASI-M
		SM 2540D	MP3	1	PASI-MT
		EPA 300.0	JH1	1	PASI-MT
		SM 2320B	MWD	1	PASI-M
		SM 2540C	CAP	1	PASI-M
10156716006	**CMMW-6**	EPA 200.8	RJS	11	PASI-M
		SM 2540D	MP3	1	PASI-MT
		EPA 300.0	JH1	1	PASI-MT
		SM 2320B	MWD	1	PASI-M
		SM 2540C	CAP	1	PASI-M
10156716007	**CMMW-7**	EPA 200.8	RJS	11	PASI-M
		SM 2540D	MP3	1	PASI-MT
		EPA 300.0	JH1	1	PASI-MT
		SM 2320B	MWD	1	PASI-M
		SM 2540C	CAP	1	PASI-M
10156716008	**CMMW-8**	EPA 200.8	RJS	11	PASI-M
		SM 2540D	MP3	1	PASI-MT

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SAMPLE ANALYTE COUNT

Project: Black Pine Mine
Pace Project No.: 10156716

Lab ID	Sample ID	Method	Analysts	Analytes Reported	Laboratory
		EPA 300.0	JH1	1	PASI-MT
		SM 2320B	MWD	1	PASI-M
		SM 2540C	CAP	1	PASI-M
10156716009	**CMMW-9**	EPA 200.8	RJS	11	PASI-M
		SM 2540D	MP3	1	PASI-MT
		EPA 300.0	JH1	1	PASI-MT
		SM 2320B	MWD	1	PASI-M
		SM 2540C	CAP	1	PASI-M
10156716010	**FIELD DUPLICATE**	EPA 200.8	RJS	11	PASI-M
		SM 2540D	MP3	1	PASI-MT
		EPA 300.0	JH1	1	PASI-MT
		SM 2320B	MWD	1	PASI-M
		SM 2540C	CAP	1	PASI-M

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PROJECT NARRATIVE

Project: Black Pine Mine
Pace Project No.: 10156716

Method: **EPA 200.8**
Description: 200.8 MET ICPMS, Dissolved
Client: Montana Dept. of Environmental Quality
Date: May 25, 2011

General Information:
10 samples were analyzed for EPA 200.8. All samples were received in acceptable condition with any exceptions noted below.

Hold Time:
The samples were analyzed within the method required hold times with any exceptions noted below.

Sample Preparation:
The samples were prepared in accordance with EPA 200.8 with any exceptions noted below.

Initial Calibrations (including MS Tune as applicable):
All criteria were within method requirements with any exceptions noted below.

Continuing Calibration:
All criteria were within method requirements with any exceptions noted below.

Internal Standards:
All internal standards were within QC limits with any exceptions noted below.

Method Blank:
All analytes were below the report limit in the method blank with any exceptions noted below.

Laboratory Control Spike:
All laboratory control spike compounds were within QC limits with any exceptions noted below.

Matrix Spikes:
All percent recoveries and relative percent differences (RPDs) were within acceptance criteria with any exceptions noted below.

QC Batch: MPRP/26002

A matrix spike and matrix spike duplicate (MS/MSD) were performed on the following sample(s): 10156716005,3046013001

M1: Matrix spike recovery exceeded QC limits. Batch accepted based on laboratory control sample (LCS) recovery.

- MS (Lab ID: 973524)
  - Potassium, Dissolved
- MS (Lab ID: 973526)
  - Calcium, Dissolved
- MSD (Lab ID: 973525)
  - Potassium, Dissolved

M6: Matrix spike and Matrix spike duplicate recovery not evaluated against control limits due to sample dilution.

- MS (Lab ID: 973524)
  - Calcium, Dissolved
  - Magnesium, Dissolved
  - Sodium, Dissolved
- MS (Lab ID: 973526)
  - Copper, Dissolved
  - Manganese, Dissolved

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PROJECT NARRATIVE

Project: Black Pine Mine
Pace Project No.: 10156716

Method: **EPA 200.8**
Description: 200.8 MET ICPMS, Dissolved
Client: Montana Dept. of Environmental Quality
Date: May 25, 2011

QC Batch: MPRP/26002

A matrix spike and matrix spike duplicate (MS/MSD) were performed on the following sample(s): 10156716005,3046013001

M6: Matrix spike and Matrix spike duplicate recovery not evaluated against control limits due to sample dilution.

- Zinc, Dissolved

- MSD (Lab ID: 973525)
  - Calcium, Dissolved
  - Magnesium, Dissolved
  - Sodium, Dissolved

Duplicate Sample:
All duplicate sample results were within method acceptance criteria with any exceptions noted below.

Additional Comments:

Analyte Comments:

QC Batch: MPRP/26002

E: Analyte concentration exceeded the calibration range. The reported result is estimated.

- MS (Lab ID: 973526)
  - Copper, Dissolved
  - Zinc, Dissolved

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PROJECT NARRATIVE

Project: Black Pine Mine
Pace Project No.: 10156716

Method: **SM 2540D**
Description: 2540D Total Suspended Solids
Client: Montana Dept. of Environmental Quality
Date: May 25, 2011

General Information:
10 samples were analyzed for SM 2540D. All samples were received in acceptable condition with any exceptions noted below.

Hold Time:
The samples were analyzed within the method required hold times with any exceptions noted below.

Initial Calibrations (including MS Tune as applicable):
All criteria were within method requirements with any exceptions noted below.

Continuing Calibration:
All criteria were within method requirements with any exceptions noted below.

Internal Standards:
All internal standards were within QC limits with any exceptions noted below.

Surrogates:
All surrogates were within QC limits with any exceptions noted below.

Method Blank:
All analytes were below the report limit in the method blank with any exceptions noted below.

Laboratory Control Spike:
All laboratory control spike compounds were within QC limits with any exceptions noted below.

Matrix Spikes:
All percent recoveries and relative percent differences (RPDs) were within acceptance criteria with any exceptions noted below.

Duplicate Sample:
All duplicate sample results were within method acceptance criteria with any exceptions noted below.

Additional Comments:

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PROJECT NARRATIVE

Project: Black Pine Mine
Pace Project No.: 10156716

Method: **EPA 300.0**
Description: 300.0 IC Anions
Client: Montana Dept. of Environmental Quality
Date: May 25, 2011

General Information:
10 samples were analyzed for EPA 300.0. All samples were received in acceptable condition with any exceptions noted below.

Hold Time:
The samples were analyzed within the method required hold times with any exceptions noted below.

Initial Calibrations (including MS Tune as applicable):
All criteria were within method requirements with any exceptions noted below.

Continuing Calibration:
All criteria were within method requirements with any exceptions noted below.

Internal Standards:
All internal standards were within QC limits with any exceptions noted below.

Surrogates:
All surrogates were within QC limits with any exceptions noted below.

Method Blank:
All analytes were below the report limit in the method blank with any exceptions noted below.

Laboratory Control Spike:
All laboratory control spike compounds were within QC limits with any exceptions noted below.

Matrix Spikes:
All percent recoveries and relative percent differences (RPDs) were within acceptance criteria with any exceptions noted below.

Duplicate Sample:
All duplicate sample results were within method acceptance criteria with any exceptions noted below.

Additional Comments:

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PROJECT NARRATIVE

Project: Black Pine Mine
Pace Project No.: 10156716

Method: **SM 2320B**
Description: 2320B Alkalinity
Client: Montana Dept. of Environmental Quality
Date: May 25, 2011

General Information:
10 samples were analyzed for SM 2320B. All samples were received in acceptable condition with any exceptions noted below.

Hold Time:
The samples were analyzed within the method required hold times with any exceptions noted below.

Method Blank:
All analytes were below the report limit in the method blank with any exceptions noted below.

Laboratory Control Spike:
All laboratory control spike compounds were within QC limits with any exceptions noted below.

Matrix Spikes:
All percent recoveries and relative percent differences (RPDs) were within acceptance criteria with any exceptions noted below.

QC Batch: WET/22267

A matrix spike and matrix spike duplicate (MS/MSD) were performed on the following sample(s): 10156475001,10156716006

M1: Matrix spike recovery exceeded QC limits. Batch accepted based on laboratory control sample (LCS) recovery.

- MSD (Lab ID: 974281)
  - Alkalinity, Total as CaCO3

Duplicate Sample:
All duplicate sample results were within method acceptance criteria with any exceptions noted below.

Additional Comments:

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PROJECT NARRATIVE

Project: Black Pine Mine
Pace Project No.: 10156716

Method: **SM 2540C**
Description: 2540C Total Dissolved Solids
Client: Montana Dept. of Environmental Quality
Date: May 25, 2011

General Information:
10 samples were analyzed for SM 2540C. All samples were received in acceptable condition with any exceptions noted below.

Hold Time:
The samples were analyzed within the method required hold times with any exceptions noted below.

Method Blank:
All analytes were below the report limit in the method blank with any exceptions noted below.

Laboratory Control Spike:
All laboratory control spike compounds were within QC limits with any exceptions noted below.

Matrix Spikes:
All percent recoveries and relative percent differences (RPDs) were within acceptance criteria with any exceptions noted below.

Duplicate Sample:
All duplicate sample results were within method acceptance criteria with any exceptions noted below.

Additional Comments:

Analyte Comments:

QC Batch: WET/22274

1M: Duplicate was analyzed out of hold for confirmation of failing RPD results of original analysis conducted within hold. Upon re-analysis the results were confirmed to original parent sample results; including passing RPD recovery. Results have been flagged and reported accordingly.

- DUP (Lab ID: 974435)
  - Total Dissolved Solids

This data package has been reviewed for quality and completeness and is approved for release.

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ANALYTICAL RESULTS

Project: Black Pine Mine
Pace Project No.: 10156716

Sample: CMMW-1 **Lab ID: 10156716001** Collected: 05/05/11 17:00 Received: 05/07/11 10:00 Matrix: Water

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
200.8 MET ICPMS, Dissolved	Analytical Method: EPA 200.8 Preparation Method: EPA 200.8							
Arsenic, Dissolved	**1.6**	ug/L	0.50	1	05/10/11 18:52	05/13/11 17:30	7440-38-2	
Cadmium, Dissolved	**0.13**	ug/L	0.080	1	05/10/11 18:52	05/13/11 17:30	7440-43-9	
Calcium, Dissolved	**7040**	ug/L	20.0	1	05/10/11 18:52	05/13/11 17:30	7440-70-2	
Copper, Dissolved	**1.3**	ug/L	0.50	1	05/10/11 18:52	05/13/11 17:30	7440-50-8	
Iron, Dissolved	**550**	ug/L	50.0	1	05/10/11 18:52	05/13/11 17:30	7439-89-6	
Lead, Dissolved	**0.90**	ug/L	0.10	1	05/10/11 18:52	05/13/11 17:30	7439-92-1	
Magnesium, Dissolved	**3960**	ug/L	5.0	1	05/10/11 18:52	05/13/11 17:30	7439-95-4	
Manganese, Dissolved	**7.1**	ug/L	0.50	1	05/10/11 18:52	05/13/11 17:30	7439-96-5	
Potassium, Dissolved	**1270**	ug/L	20.0	1	05/10/11 18:52	05/13/11 17:30	7440-09-7	
Sodium, Dissolved	**8380**	ug/L	250	5	05/10/11 18:52	05/16/11 13:11	7440-23-5	
Zinc, Dissolved	**6.1**	ug/L	5.0	1	05/10/11 18:52	05/13/11 17:30	7440-66-6	
2540D Total Suspended Solids	Analytical Method: SM 2540D							
Total Suspended Solids	**1930**	mg/L	4.0	1		05/10/11 08:45		
300.0 IC Anions	Analytical Method: EPA 300.0							
Sulfate	**2.3**	mg/L	1.0	1		05/16/11 14:20	14808-79-8	
2320B Alkalinity	Analytical Method: SM 2320B							
Alkalinity, Total as CaCO3	**42.6**	mg/L	5.0	1		05/11/11 10:01		
2540C Total Dissolved Solids	Analytical Method: SM 2540C							
Total Dissolved Solids	**86.0**	mg/L	20.0	1		05/12/11 08:38		

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ANALYTICAL RESULTS

Project: Black Pine Mine
Pace Project No.: 10156716

Sample: CMMW-2 **Lab ID: 10156716002** Collected: 05/05/11 17:30 Received: 05/07/11 10:00 Matrix: Water

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
200.8 MET ICPMS, Dissolved	Analytical Method: EPA 200.8 Preparation Method: EPA 200.8							
Arsenic, Dissolved	**108**	ug/L	0.50	1	05/10/11 18:52	05/13/11 17:39	7440-38-2	
Cadmium, Dissolved	**14.5**	ug/L	0.080	1	05/10/11 18:52	05/13/11 17:39	7440-43-9	
Calcium, Dissolved	**277000**	ug/L	1000	50	05/10/11 18:52	05/16/11 12:46	7440-70-2	
Copper, Dissolved	**239**	ug/L	0.50	1	05/10/11 18:52	05/13/11 17:39	7440-50-8	
Iron, Dissolved	**121**	ug/L	50.0	1	05/10/11 18:52	05/13/11 17:39	7439-89-6	
Lead, Dissolved	**8.6**	ug/L	0.10	1	05/10/11 18:52	05/13/11 17:39	7439-92-1	
Magnesium, Dissolved	**56500**	ug/L	25.0	5	05/10/11 18:52	05/13/11 17:44	7439-95-4	
Manganese, Dissolved	**103**	ug/L	0.50	1	05/10/11 18:52	05/13/11 17:39	7439-96-5	
Potassium, Dissolved	**17200**	ug/L	20.0	1	05/10/11 18:52	05/13/11 17:39	7440-09-7	
Sodium, Dissolved	**106000**	ug/L	2500	50	05/10/11 18:52	05/16/11 12:46	7440-23-5	
Zinc, Dissolved	**1410**	ug/L	25.0	5	05/10/11 18:52	05/13/11 17:44	7440-66-6	
2540D Total Suspended Solids	Analytical Method: SM 2540D							
Total Suspended Solids	**89.9**	mg/L	4.8	1		05/10/11 08:45		
300.0 IC Anions	Analytical Method: EPA 300.0							
Sulfate	**927**	mg/L	25.0	25		05/19/11 17:17	14808-79-8	
2320B Alkalinity	Analytical Method: SM 2320B							
Alkalinity, Total as CaCO3	**176**	mg/L	5.0	1		05/11/11 10:04		
2540C Total Dissolved Solids	Analytical Method: SM 2540C							
Total Dissolved Solids	**1600**	mg/L	20.0	1		05/12/11 08:39		

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ANALYTICAL RESULTS

Project: Black Pine Mine
Pace Project No.: 10156716

Sample: CMMW-3 **Lab ID: 10156716003** Collected: 05/05/11 15:40 Received: 05/07/11 10:00 Matrix: Water

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
200.8 MET ICPMS, Dissolved	Analytical Method: EPA 200.8 Preparation Method: EPA 200.8							
Arsenic, Dissolved	**<0.50**	ug/L	0.50	1	05/10/11 18:52	05/13/11 17:48	7440-38-2	
Cadmium, Dissolved	**170**	ug/L	0.080	1	05/10/11 18:52	05/13/11 17:48	7440-43-9	
Calcium, Dissolved	**57200**	ug/L	100	5	05/10/11 18:52	05/16/11 12:51	7440-70-2	
Copper, Dissolved	**12100**	ug/L	25.0	50	05/10/11 18:52	05/16/11 12:55	7440-50-8	
Iron, Dissolved	**<50.0**	ug/L	50.0	1	05/10/11 18:52	05/13/11 17:48	7439-89-6	
Lead, Dissolved	**0.31**	ug/L	0.10	1	05/10/11 18:52	05/13/11 17:48	7439-92-1	
Magnesium, Dissolved	**23400**	ug/L	25.0	5	05/10/11 18:52	05/16/11 12:51	7439-95-4	
Manganese, Dissolved	**4280**	ug/L	25.0	50	05/10/11 18:52	05/16/11 12:55	7439-96-5	
Potassium, Dissolved	**4250**	ug/L	20.0	1	05/10/11 18:52	05/13/11 17:48	7440-09-7	
Sodium, Dissolved	**6430**	ug/L	250	5	05/10/11 18:52	05/16/11 12:51	7440-23-5	
Zinc, Dissolved	**12200**	ug/L	250	50	05/10/11 18:52	05/16/11 12:55	7440-66-6	
2540D Total Suspended Solids	Analytical Method: SM 2540D							
Total Suspended Solids	**358**	mg/L	2.0	1		05/10/11 08:45		
300.0 IC Anions	Analytical Method: EPA 300.0							
Sulfate	**282**	mg/L	10.0	10		05/19/11 18:14	14808-79-8	
2320B Alkalinity	Analytical Method: SM 2320B							
Alkalinity, Total as CaCO3	**<5.0**	mg/L	5.0	1		05/11/11 10:07		
2540C Total Dissolved Solids	Analytical Method: SM 2540C							
Total Dissolved Solids	**516**	mg/L	22.2	1		05/12/11 08:40		

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ANALYTICAL RESULTS

Project: Black Pine Mine
Pace Project No.: 10156716

Sample: CMMW-4 **Lab ID: 10156716004** Collected: 05/05/11 16:10 Received: 05/07/11 10:00 Matrix: Water

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
200.8 MET ICPMS, Dissolved	Analytical Method: EPA 200.8 Preparation Method: EPA 200.8							
Arsenic, Dissolved	**<0.50**	ug/L	0.50	1	05/10/11 18:52	05/13/11 18:16	7440-38-2	
Cadmium, Dissolved	**51.9**	ug/L	0.080	1	05/10/11 18:52	05/13/11 18:16	7440-43-9	
Calcium, Dissolved	**39700**	ug/L	100	5	05/10/11 18:52	05/16/11 13:16	7440-70-2	
Copper, Dissolved	**3120**	ug/L	25.0	50	05/10/11 18:52	05/16/11 13:21	7440-50-8	
Iron, Dissolved	**<50.0**	ug/L	50.0	1	05/10/11 18:52	05/13/11 18:16	7439-89-6	
Lead, Dissolved	**0.12**	ug/L	0.10	1	05/10/11 18:52	05/13/11 18:16	7439-92-1	
Magnesium, Dissolved	**14500**	ug/L	5.0	1	05/10/11 18:52	05/13/11 18:16	7439-95-4	
Manganese, Dissolved	**884**	ug/L	2.5	5	05/10/11 18:52	05/16/11 13:16	7439-96-5	
Potassium, Dissolved	**2340**	ug/L	20.0	1	05/10/11 18:52	05/13/11 18:16	7440-09-7	
Sodium, Dissolved	**7000**	ug/L	250	5	05/10/11 18:52	05/16/11 13:16	7440-23-5	
Zinc, Dissolved	**3940**	ug/L	250	50	05/10/11 18:52	05/16/11 13:21	7440-66-6	
2540D Total Suspended Solids	Analytical Method: SM 2540D							
Total Suspended Solids	**21.9**	mg/L	1.0	1		05/10/11 08:45		
300.0 IC Anions	Analytical Method: EPA 300.0							
Sulfate	**174**	mg/L	5.0	5		05/19/11 18:42	14808-79-8	
2320B Alkalinity	Analytical Method: SM 2320B							
Alkalinity, Total as CaCO3	**<5.0**	mg/L	5.0	1		05/11/11 10:17		
2540C Total Dissolved Solids	Analytical Method: SM 2540C							
Total Dissolved Solids	**294**	mg/L	10.0	1		05/12/11 08:41		

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ANALYTICAL RESULTS

Project: Black Pine Mine
Pace Project No.: 10156716

Sample: CMMW-5 **Lab ID: 10156716005** Collected: 05/05/11 18:00 Received: 05/07/11 10:00 Matrix: Water

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
200.8 MET ICPMS, Dissolved	Analytical Method: EPA 200.8 Preparation Method: EPA 200.8							
Arsenic, Dissolved	**3.0**	ug/L	0.50	1	05/10/11 18:52	05/13/11 18:25	7440-38-2	
Cadmium, Dissolved	**152**	ug/L	0.080	1	05/10/11 18:52	05/13/11 18:25	7440-43-9	
Calcium, Dissolved	**23500**	ug/L	100	5	05/10/11 18:52	05/16/11 13:25	7440-70-2	M1
Copper, Dissolved	**7100**	ug/L	25.0	50	05/10/11 18:52	05/16/11 13:35	7440-50-8	M6
Iron, Dissolved	**988**	ug/L	50.0	1	05/10/11 18:52	05/13/11 18:25	7439-89-6	
Lead, Dissolved	**23.2**	ug/L	0.10	1	05/10/11 18:52	05/13/11 18:25	7439-92-1	
Magnesium, Dissolved	**8100**	ug/L	5.0	1	05/10/11 18:52	05/13/11 18:25	7439-95-4	
Manganese, Dissolved	**4040**	ug/L	25.0	50	05/10/11 18:52	05/16/11 13:35	7439-96-5	M6
Potassium, Dissolved	**3400**	ug/L	20.0	1	05/10/11 18:52	05/13/11 18:25	7440-09-7	
Sodium, Dissolved	**2670**	ug/L	250	5	05/10/11 18:52	05/16/11 13:25	7440-23-5	
Zinc, Dissolved	**10700**	ug/L	250	50	05/10/11 18:52	05/16/11 13:35	7440-66-6	M6
2540D Total Suspended Solids	Analytical Method: SM 2540D							
Total Suspended Solids	**782**	mg/L	4.9	1		05/10/11 08:45		
300.0 IC Anions	Analytical Method: EPA 300.0							
Sulfate	**113**	mg/L	3.0	3		05/19/11 19:11	14808-79-8	
2320B Alkalinity	Analytical Method: SM 2320B							
Alkalinity, Total as CaCO3	**<5.0**	mg/L	5.0	1		05/11/11 10:19		
2540C Total Dissolved Solids	Analytical Method: SM 2540C							
Total Dissolved Solids	**268**	mg/L	40.0	1		05/12/11 08:42		

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ANALYTICAL RESULTS

Project: Black Pine Mine
Pace Project No.: 10156716

Sample: CMMW-6 **Lab ID: 10156716006** Collected: 05/05/11 18:50 Received: 05/07/11 10:00 Matrix: Water

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
200.8 MET ICPMS, Dissolved	Analytical Method: EPA 200.8 Preparation Method: EPA 200.8							
Arsenic, Dissolved	**1.9**	ug/L	0.50	1	05/10/11 18:52	05/13/11 18:38	7440-38-2	
Cadmium, Dissolved	**0.53**	ug/L	0.080	1	05/10/11 18:52	05/13/11 18:38	7440-43-9	
Calcium, Dissolved	**11600**	ug/L	20.0	1	05/10/11 18:52	05/13/11 18:38	7440-70-2	
Copper, Dissolved	**19.4**	ug/L	0.50	1	05/10/11 18:52	05/13/11 18:38	7440-50-8	
Iron, Dissolved	**661**	ug/L	50.0	1	05/10/11 18:52	05/13/11 18:38	7439-89-6	
Lead, Dissolved	**4.1**	ug/L	0.10	1	05/10/11 18:52	05/13/11 18:38	7439-92-1	
Magnesium, Dissolved	**4920**	ug/L	5.0	1	05/10/11 18:52	05/13/11 18:38	7439-95-4	
Manganese, Dissolved	**19.9**	ug/L	0.50	1	05/10/11 18:52	05/13/11 18:38	7439-96-5	
Potassium, Dissolved	**2220**	ug/L	20.0	1	05/10/11 18:52	05/13/11 18:38	7440-09-7	
Sodium, Dissolved	**3270**	ug/L	250	5	05/10/11 18:52	05/16/11 13:39	7440-23-5	
Zinc, Dissolved	**33.3**	ug/L	5.0	1	05/10/11 18:52	05/13/11 18:38	7440-66-6	
2540D Total Suspended Solids	Analytical Method: SM 2540D							
Total Suspended Solids	**311**	mg/L	4.0	1		05/10/11 08:45		
300.0 IC Anions	Analytical Method: EPA 300.0							
Sulfate	**11.9**	mg/L	2.0	2		05/19/11 19:39	14808-79-8	
2320B Alkalinity	Analytical Method: SM 2320B							
Alkalinity, Total as CaCO3	**39.0**	mg/L	5.0	1		05/11/11 10:21		
2540C Total Dissolved Solids	Analytical Method: SM 2540C							
Total Dissolved Solids	**150**	mg/L	25.0	1		05/12/11 08:42		

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ANALYTICAL RESULTS

Project: Black Pine Mine
Pace Project No.: 10156716

Sample: CMMW-7 **Lab ID: 10156716007** Collected: 05/05/11 14:50 Received: 05/07/11 10:00 Matrix: Water

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
200.8 MET ICPMS, Dissolved	Analytical Method: EPA 200.8 Preparation Method: EPA 200.8							
Arsenic, Dissolved	**2.2**	ug/L	0.50	1	05/10/11 18:52	05/13/11 18:47	7440-38-2	
Cadmium, Dissolved	**305**	ug/L	0.080	1	05/10/11 18:52	05/13/11 18:47	7440-43-9	
Calcium, Dissolved	**95600**	ug/L	100	5	05/10/11 18:52	05/16/11 13:44	7440-70-2	
Copper, Dissolved	**22200**	ug/L	50.0	100	05/10/11 18:52	05/16/11 13:49	7440-50-8	
Iron, Dissolved	**2050**	ug/L	50.0	1	05/10/11 18:52	05/13/11 18:47	7439-89-6	
Lead, Dissolved	**2.6**	ug/L	0.10	1	05/10/11 18:52	05/13/11 18:47	7439-92-1	
Magnesium, Dissolved	**38800**	ug/L	25.0	5	05/10/11 18:52	05/16/11 13:44	7439-95-4	
Manganese, Dissolved	**7740**	ug/L	50.0	100	05/10/11 18:52	05/16/11 13:49	7439-96-5	
Potassium, Dissolved	**5650**	ug/L	20.0	1	05/10/11 18:52	05/13/11 18:47	7440-09-7	
Sodium, Dissolved	**7320**	ug/L	250	5	05/10/11 18:52	05/16/11 13:44	7440-23-5	
Zinc, Dissolved	**22300**	ug/L	500	100	05/10/11 18:52	05/16/11 13:49	7440-66-6	
2540D Total Suspended Solids	Analytical Method: SM 2540D							
Total Suspended Solids	**4170**	mg/L	8.8	1		05/10/11 08:45		
300.0 IC Anions	Analytical Method: EPA 300.0							
Sulfate	**480**	mg/L	50.0	50		05/23/11 19:17	14808-79-8	
2320B Alkalinity	Analytical Method: SM 2320B							
Alkalinity, Total as CaCO3	**13.0**	mg/L	5.0	1		05/11/11 10:41		
2540C Total Dissolved Solids	Analytical Method: SM 2540C							
Total Dissolved Solids	**802**	mg/L	25.0	1		05/12/11 08:43		

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ANALYTICAL RESULTS

Project: Black Pine Mine
Pace Project No.: 10156716

Sample: CMMW-8 **Lab ID: 10156716008** Collected: 05/05/11 14:10 Received: 05/07/11 10:00 Matrix: Water

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
200.8 MET ICPMS, Dissolved	Analytical Method: EPA 200.8 Preparation Method: EPA 200.8							
Arsenic, Dissolved	**0.57**	ug/L	0.50	1	05/10/11 18:52	05/13/11 19:10	7440-38-2	
Cadmium, Dissolved	**155**	ug/L	0.080	1	05/10/11 18:52	05/13/11 19:10	7440-43-9	
Calcium, Dissolved	**145000**	ug/L	1000	50	05/10/11 18:52	05/17/11 07:55	7440-70-2	
Copper, Dissolved	**8420**	ug/L	25.0	50	05/10/11 18:52	05/17/11 07:55	7440-50-8	
Iron, Dissolved	**281**	ug/L	50.0	1	05/10/11 18:52	05/13/11 19:10	7439-89-6	
Lead, Dissolved	**0.48**	ug/L	0.10	1	05/10/11 18:52	05/13/11 19:10	7439-92-1	
Magnesium, Dissolved	**63800**	ug/L	25.0	5	05/10/11 18:52	05/17/11 07:51	7439-95-4	
Manganese, Dissolved	**4550**	ug/L	25.0	50	05/10/11 18:52	05/17/11 07:55	7439-96-5	
Potassium, Dissolved	**5520**	ug/L	20.0	1	05/10/11 18:52	05/13/11 19:10	7440-09-7	
Sodium, Dissolved	**32900**	ug/L	250	5	05/10/11 18:52	05/17/11 07:51	7440-23-5	
Zinc, Dissolved	**12300**	ug/L	250	50	05/10/11 18:52	05/17/11 07:55	7440-66-6	
2540D Total Suspended Solids	Analytical Method: SM 2540D							
Total Suspended Solids	**350**	mg/L	9.8	1		05/10/11 08:45		
300.0 IC Anions	Analytical Method: EPA 300.0							
Sulfate	**656**	mg/L	50.0	50		05/23/11 19:45	14808-79-8	
2320B Alkalinity	Analytical Method: SM 2320B							
Alkalinity, Total as CaCO3	**18.6**	mg/L	5.0	1		05/11/11 10:44		
2540C Total Dissolved Solids	Analytical Method: SM 2540C							
Total Dissolved Solids	**1020**	mg/L	13.3	1		05/12/11 08:44		

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ANALYTICAL RESULTS

Project: Black Pine Mine
Pace Project No.: 10156716

Sample: CMMW-9 **Lab ID: 10156716009** Collected: 05/05/11 16:30 Received: 05/07/11 10:00 Matrix: Water

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
200.8 MET ICPMS, Dissolved	Analytical Method: EPA 200.8 Preparation Method: EPA 200.8							
Arsenic, Dissolved	**0.72**	ug/L	0.50	1	05/10/11 18:52	05/13/11 19:19	7440-38-2	
Cadmium, Dissolved	**6.9**	ug/L	0.080	1	05/10/11 18:52	05/13/11 19:19	7440-43-9	
Calcium, Dissolved	**87200**	ug/L	100	5	05/10/11 18:52	05/16/11 13:53	7440-70-2	
Copper, Dissolved	**24.1**	ug/L	0.50	1	05/10/11 18:52	05/13/11 19:19	7440-50-8	
Iron, Dissolved	**197**	ug/L	50.0	1	05/10/11 18:52	05/13/11 19:19	7439-89-6	
Lead, Dissolved	**0.38**	ug/L	0.10	1	05/10/11 18:52	05/13/11 19:19	7439-92-1	
Magnesium, Dissolved	**26800**	ug/L	25.0	5	05/10/11 18:52	05/16/11 13:53	7439-95-4	
Manganese, Dissolved	**86.4**	ug/L	0.50	1	05/10/11 18:52	05/13/11 19:19	7439-96-5	
Potassium, Dissolved	**4910**	ug/L	20.0	1	05/10/11 18:52	05/13/11 19:19	7440-09-7	
Sodium, Dissolved	**29400**	ug/L	250	5	05/10/11 18:52	05/16/11 13:53	7440-23-5	
Zinc, Dissolved	**709**	ug/L	25.0	5	05/10/11 18:52	05/16/11 13:53	7440-66-6	
2540D Total Suspended Solids	Analytical Method: SM 2540D							
Total Suspended Solids	**1330**	mg/L	9.4	1		05/10/11 08:45		
300.0 IC Anions	Analytical Method: EPA 300.0							
Sulfate	**299**	mg/L	25.0	25		05/23/11 20:14	14808-79-8	
2320B Alkalinity	Analytical Method: SM 2320B							
Alkalinity, Total as CaCO3	**23.4**	mg/L	5.0	1		05/11/11 10:46		
2540C Total Dissolved Solids	Analytical Method: SM 2540C							
Total Dissolved Solids	**616**	mg/L	40.0	1		05/12/11 08:45		

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ANALYTICAL RESULTS

Project: Black Pine Mine
Pace Project No.: 10156716

Sample: FIELD DUPLICATE **Lab ID: 10156716010** Collected: 05/05/11 00:00 Received: 05/07/11 10:00 Matrix: Water

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
200.8 MET ICPMS, Dissolved	Analytical Method: EPA 200.8 Preparation Method: EPA 200.8							
Arsenic, Dissolved	**1.2**	ug/L	0.50	1	05/10/11 18:52	05/13/11 19:28	7440-38-2	
Cadmium, Dissolved	**0.10**	ug/L	0.080	1	05/10/11 18:52	05/13/11 19:28	7440-43-9	
Calcium, Dissolved	**7020**	ug/L	20.0	1	05/10/11 18:52	05/13/11 19:28	7440-70-2	
Copper, Dissolved	**0.93**	ug/L	0.50	1	05/10/11 18:52	05/13/11 19:28	7440-50-8	
Iron, Dissolved	**73.0**	ug/L	50.0	1	05/10/11 18:52	05/13/11 19:28	7439-89-6	
Lead, Dissolved	**0.15**	ug/L	0.10	1	05/10/11 18:52	05/13/11 19:28	7439-92-1	
Magnesium, Dissolved	**3840**	ug/L	5.0	1	05/10/11 18:52	05/13/11 19:28	7439-95-4	
Manganese, Dissolved	**3.6**	ug/L	0.50	1	05/10/11 18:52	05/13/11 19:28	7439-96-5	
Potassium, Dissolved	**864**	ug/L	20.0	1	05/10/11 18:52	05/13/11 19:28	7440-09-7	
Sodium, Dissolved	**10100**	ug/L	250	5	05/10/11 18:52	05/16/11 14:40	7440-23-5	
Zinc, Dissolved	**<5.0**	ug/L	5.0	1	05/10/11 18:52	05/13/11 19:28	7440-66-6	
2540D Total Suspended Solids	Analytical Method: SM 2540D							
Total Suspended Solids	**3810**	mg/L	8.8	1		05/10/11 08:45		
300.0 IC Anions	Analytical Method: EPA 300.0							
Sulfate	**2.8**	mg/L	2.0	2		05/19/11 22:29	14808-79-8	
2320B Alkalinity	Analytical Method: SM 2320B							
Alkalinity, Total as CaCO3	**48.1**	mg/L	5.0	1		05/11/11 10:49		
2540C Total Dissolved Solids	Analytical Method: SM 2540C							
Total Dissolved Solids	**231**	mg/L	62.5	1		05/12/11 08:45		

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QUALITY CONTROL DATA

Project: Black Pine Mine
Pace Project No.: 10156716

QC Batch: MPRP/26002 Analysis Method: EPA 200.8
QC Batch Method: EPA 200.8 Analysis Description: 200.8 MET Dissolved
Associated Lab Samples: 10156716001, 10156716002, 10156716003, 10156716004, 10156716005, 10156716006, 10156716007, 10156716008, 10156716009, 10156716010

METHOD BLANK: 973522 Matrix: Water
Associated Lab Samples: 10156716001, 10156716002, 10156716003, 10156716004, 10156716005, 10156716006, 10156716007, 10156716008, 10156716009, 10156716010

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Arsenic, Dissolved	ug/L	<0.50	0.50	05/13/11 16:04	
Cadmium, Dissolved	ug/L	<0.080	0.080	05/13/11 16:04	
Calcium, Dissolved	ug/L	<20.0	20.0	05/13/11 16:04	
Copper, Dissolved	ug/L	<0.50	0.50	05/13/11 16:04	
Iron, Dissolved	ug/L	<50.0	50.0	05/13/11 16:04	
Lead, Dissolved	ug/L	<0.10	0.10	05/13/11 16:04	
Magnesium, Dissolved	ug/L	<5.0	5.0	05/13/11 16:04	
Manganese, Dissolved	ug/L	<0.50	0.50	05/13/11 16:04	
Potassium, Dissolved	ug/L	<20.0	20.0	05/13/11 16:04	
Sodium, Dissolved	ug/L	<50.0	50.0	05/16/11 14:07	
Zinc, Dissolved	ug/L	<5.0	5.0	05/13/11 16:04	

LABORATORY CONTROL SAMPLE: 973523

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Arsenic, Dissolved	ug/L	80	82.8	103	85-115	
Cadmium, Dissolved	ug/L	80	82.1	103	85-115	
Calcium, Dissolved	ug/L	1000	1040	104	85-115	
Copper, Dissolved	ug/L	80	83.0	104	85-115	
Iron, Dissolved	ug/L	1000	990	99	85-115	
Lead, Dissolved	ug/L	80	84.1	105	85-115	
Magnesium, Dissolved	ug/L	1000	1040	104	85-115	
Manganese, Dissolved	ug/L	80	85.5	107	85-115	
Potassium, Dissolved	ug/L	1000	1020	102	85-115	
Sodium, Dissolved	ug/L	1000	959	96	85-115	
Zinc, Dissolved	ug/L	80	82.3	103	85-115	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 973524 973525

Parameter	Units	3046013001 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Arsenic, Dissolved	ug/L	0.81	80	80	97.2	99.4	121	123	70-130	2	20	
Cadmium, Dissolved	ug/L	ND	80	80	89.6	92.2	112	115	70-130	3	20	
Calcium, Dissolved	ug/L	479000	1000	1000	394000	440000	-8540	-3900	70-130	11	20	M6
Copper, Dissolved	ug/L	1.3	80	80	92.0	94.0	113	116	70-130	2	20	
Iron, Dissolved	ug/L	ND	1000	1000	1100	1110	109	111	70-130	1	20	
Lead, Dissolved	ug/L	ND	80	80	87.6	91.3	109	114	70-130	4	20	
Magnesium, Dissolved	ug/L	170000	1000	1000	141000	156000	-2840	-1310	70-130	10	20	M6

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QUALITY CONTROL DATA

Project: Black Pine Mine
Pace Project No.: 10156716

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 973524 973525

Parameter	Units	3046013001 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Manganese, Dissolved	ug/L	44.2	80	80	139	143	119	123	70-130	3	20	
Potassium, Dissolved	ug/L	34600	1000	1000	36800	38500	214	382	70-130	4	20	M1
Sodium, Dissolved	ug/L	156000	1000	1000	133000	147000	-2310	-902	70-130	10	20	M6
Zinc, Dissolved	ug/L	ND	80	80	91.8	95.4	112	116	70-130	4	20	

MATRIX SPIKE SAMPLE: 973526

Parameter	Units	10156716005 Result	Spike Conc.	MS Result	MS % Rec	% Rec Limits	Qualifiers
Arsenic, Dissolved	ug/L	3.0	80	85.2	103	70-130	
Cadmium, Dissolved	ug/L	152	80	239	109	70-130	
Calcium, Dissolved	ug/L	23500	1000	23700	22	70-130	M1
Copper, Dissolved	ug/L	7100	80	7800	869	70-130	E,M6
Iron, Dissolved	ug/L	988	1000	2220	123	70-130	
Lead, Dissolved	ug/L	23.2	80	114	113	70-130	
Magnesium, Dissolved	ug/L	8100	1000	9360	126	70-130	
Manganese, Dissolved	ug/L	4040	80	4410	457	70-130	M6
Potassium, Dissolved	ug/L	3400	1000	4650	125	70-130	
Sodium, Dissolved	ug/L	2670	1000	3940	127	70-130	
Zinc, Dissolved	ug/L	10700	80	11400	819	70-130	E,M6

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QUALITY CONTROL DATA

Project: Black Pine Mine
Pace Project No.: 10156716

QC Batch: MT/5953 Analysis Method: SM 2540D
QC Batch Method: SM 2540D Analysis Description: 2540D Total Suspended Solids
Associated Lab Samples: 10156716001, 10156716002, 10156716003, 10156716004, 10156716005, 10156716006, 10156716007, 10156716008, 10156716009, 10156716010

METHOD BLANK: 973636 Matrix: Water
Associated Lab Samples: 10156716001, 10156716002, 10156716003, 10156716004, 10156716005, 10156716006, 10156716007, 10156716008, 10156716009, 10156716010

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Total Suspended Solids	mg/L	<1.0	1.0	05/10/11 08:45	

LABORATORY CONTROL SAMPLE: 973637

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Total Suspended Solids	mg/L	25	28.6	115	71-129	

SAMPLE DUPLICATE: 973638

Parameter	Units	10156585001 Result	Dup Result	RPD	Max RPD	Qualifiers
Total Suspended Solids	mg/L	281	304	8	20	

SAMPLE DUPLICATE: 973639

Parameter	Units	10156716007 Result	Dup Result	RPD	Max RPD	Qualifiers
Total Suspended Solids	mg/L	4170	3700	12	20	

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QUALITY CONTROL DATA

Project: Black Pine Mine
Pace Project No.: 10156716

QC Batch: MT/5963 Analysis Method: EPA 300.0
QC Batch Method: EPA 300.0 Analysis Description: 300.0 IC Anions
Associated Lab Samples: 10156716001, 10156716002, 10156716003, 10156716004, 10156716005, 10156716006, 10156716007, 10156716008, 10156716009, 10156716010

METHOD BLANK: 974467 Matrix: Water
Associated Lab Samples: 10156716001, 10156716002, 10156716003, 10156716004, 10156716005, 10156716006, 10156716007, 10156716008, 10156716009, 10156716010

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Sulfate	mg/L	<1.0	1.0	05/16/11 11:36	

LABORATORY CONTROL SAMPLE: 974468

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Sulfate	mg/L	20	18.6	93	90-110	

MATRIX SPIKE SAMPLE: 974470

Parameter	Units	10156915001 Result	Spike Conc.	MS Result	MS % Rec	% Rec Limits	Qualifiers
Sulfate	mg/L	542	500	1010	94	80-120	

MATRIX SPIKE SAMPLE: 974471

Parameter	Units	10156716001 Result	Spike Conc.	MS Result	MS % Rec	% Rec Limits	Qualifiers
Sulfate	mg/L	2.3	20	20.9	93	80-120	

SAMPLE DUPLICATE: 974469

Parameter	Units	10156435001 Result	Dup Result	RPD	Max RPD	Qualifiers
Sulfate	mg/L	1150	1160	1	20	

SAMPLE DUPLICATE: 974472

Parameter	Units	10156716002 Result	Dup Result	RPD	Max RPD	Qualifiers
Sulfate	mg/L	927	968	4	20	

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QUALITY CONTROL DATA

Project: Black Pine Mine
Pace Project No.: 10156716

QC Batch: WET/22267 Analysis Method: SM 2320B
QC Batch Method: SM 2320B Analysis Description: 2320B Alkalinity
Associated Lab Samples: 10156716001, 10156716002, 10156716003, 10156716004, 10156716005, 10156716006, 10156716007, 10156716008, 10156716009, 10156716010

METHOD BLANK: 974277 Matrix: Water
Associated Lab Samples: 10156716001, 10156716002, 10156716003, 10156716004, 10156716005, 10156716006, 10156716007, 10156716008, 10156716009, 10156716010

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Alkalinity, Total as CaCO3	mg/L	<5.0	5.0	05/11/11 09:24	

LABORATORY CONTROL SAMPLE & LCSD: 974278 974279

Parameter	Units	Spike Conc.	LCS Result	LCSD Result	LCS % Rec	LCSD % Rec	% Rec Limits	RPD	Max RPD	Qualifiers
Alkalinity, Total as CaCO3	mg/L	40	38.7	39.5	97	99	90-110	2	30	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 974280 974281

Parameter	Units	10156475001 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Alkalinity, Total as CaCO3	mg/L	565	40	40	599	617	86	132	80-120	3	30	M1

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 974282 974283

Parameter	Units	10156716006 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Alkalinity, Total as CaCO3	mg/L	39.0	40	40	80.7	80.5	104	104	80-120	.3	30	

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QUALITY CONTROL DATA

Project: Black Pine Mine
Pace Project No.: 10156716

QC Batch: WET/22274 Analysis Method: SM 2540C
QC Batch Method: SM 2540C Analysis Description: 2540C Total Dissolved Solids
Associated Lab Samples: 10156716001, 10156716002, 10156716003, 10156716004, 10156716005, 10156716006, 10156716007, 10156716008, 10156716009, 10156716010

METHOD BLANK: 974432 Matrix: Water
Associated Lab Samples: 10156716001, 10156716002, 10156716003, 10156716004, 10156716005, 10156716006, 10156716007, 10156716008, 10156716009, 10156716010

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Total Dissolved Solids	mg/L	<10.0	10.0	05/12/11 08:35	

LABORATORY CONTROL SAMPLE: 974433

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Total Dissolved Solids	mg/L	1000	1010	101	80-120	

SAMPLE DUPLICATE: 974434

Parameter	Units	10156585002 Result	Dup Result	RPD	Max RPD	Qualifiers
Total Dissolved Solids	mg/L	1750	1760	.5	20	

SAMPLE DUPLICATE: 974435

Parameter	Units	10156716001 Result	Dup Result	RPD	Max RPD	Qualifiers
Total Dissolved Solids	mg/L	86.0	72.0	18	20	1M

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QUALIFIERS

Project: Black Pine Mine
Pace Project No.: 10156716

DEFINITIONS

DF - Dilution Factor, if reported, represents the factor applied to the reported data due to changes in sample preparation, dilution of the sample aliquot, or moisture content.

ND - Not Detected at or above adjusted reporting limit.

J - Estimated concentration above the adjusted method detection limit and below the adjusted reporting limit.

MDL - Adjusted Method Detection Limit.

S - Surrogate

1,2-Diphenylhydrazine (8270 listed analyte) decomposes to Azobenzene.

Consistent with EPA guidelines, unrounded data are displayed and have been used to calculate % recovery and RPD values.

LCS(D) - Laboratory Control Sample (Duplicate)

MS(D) - Matrix Spike (Duplicate)

DUP - Sample Duplicate

RPD - Relative Percent Difference

NC - Not Calculable.

SG - Silica Gel - Clean-Up

U - Indicates the compound was analyzed for, but not detected.

N-Nitrosodiphenylamine decomposes and cannot be separated from Diphenylamine using Method 8270. The result reported for each analyte is a combined concentration.

LABORATORIES

PASI-M	Pace Analytical Services - Minneapolis
PASI-MT	Pace Analytical Services - Montana

ANALYTE QUALIFIERS

1M	Duplicate was analyzed out of hold for confirmation of failing RPD results of original analysis conducted within hold. Upon re-analysis the results were confirmed to original parent sample results; including passing RPD recovery. Results have been flagged and reported accordingly.
E	Analyte concentration exceeded the calibration range. The reported result is estimated.
M1	Matrix spike recovery exceeded QC limits. Batch accepted based on laboratory control sample (LCS) recovery.
M6	Matrix spike and Matrix spike duplicate recovery not evaluated against control limits due to sample dilution.

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QUALITY CONTROL DATA CROSS REFERENCE TABLE

Project: Black Pine Mine
Pace Project No.: 10156716

Lab ID	Sample ID	QC Batch Method	QC Batch	Analytical Method	Analytical Batch
10156716001	**CMMW-1**	EPA 200.8	MPRP/26002	EPA 200.8	ICPM/10641
10156716002	**CMMW-2**	EPA 200.8	MPRP/26002	EPA 200.8	ICPM/10641
10156716003	**CMMW-3**	EPA 200.8	MPRP/26002	EPA 200.8	ICPM/10641
10156716004	**CMMW-4**	EPA 200.8	MPRP/26002	EPA 200.8	ICPM/10641
10156716005	**CMMW-5**	EPA 200.8	MPRP/26002	EPA 200.8	ICPM/10641
10156716006	**CMMW-6**	EPA 200.8	MPRP/26002	EPA 200.8	ICPM/10641
10156716007	**CMMW-7**	EPA 200.8	MPRP/26002	EPA 200.8	ICPM/10641
10156716008	**CMMW-8**	EPA 200.8	MPRP/26002	EPA 200.8	ICPM/10641
10156716009	**CMMW-9**	EPA 200.8	MPRP/26002	EPA 200.8	ICPM/10641
10156716010	**FIELD DUPLICATE**	EPA 200.8	MPRP/26002	EPA 200.8	ICPM/10641
10156716001	**CMMW-1**	SM 2540D	MT/5953		
10156716002	**CMMW-2**	SM 2540D	MT/5953		
10156716003	**CMMW-3**	SM 2540D	MT/5953		
10156716004	**CMMW-4**	SM 2540D	MT/5953		
10156716005	**CMMW-5**	SM 2540D	MT/5953		
10156716006	**CMMW-6**	SM 2540D	MT/5953		
10156716007	**CMMW-7**	SM 2540D	MT/5953		
10156716008	**CMMW-8**	SM 2540D	MT/5953		
10156716009	**CMMW-9**	SM 2540D	MT/5953		
10156716010	**FIELD DUPLICATE**	SM 2540D	MT/5953		
10156716001	**CMMW-1**	EPA 300.0	MT/5963		
10156716002	**CMMW-2**	EPA 300.0	MT/5963		
10156716003	**CMMW-3**	EPA 300.0	MT/5963		
10156716004	**CMMW-4**	EPA 300.0	MT/5963		
10156716005	**CMMW-5**	EPA 300.0	MT/5963		
10156716006	**CMMW-6**	EPA 300.0	MT/5963		
10156716007	**CMMW-7**	EPA 300.0	MT/5963		
10156716008	**CMMW-8**	EPA 300.0	MT/5963		
10156716009	**CMMW-9**	EPA 300.0	MT/5963		
10156716010	**FIELD DUPLICATE**	EPA 300.0	MT/5963		
10156716001	**CMMW-1**	SM 2320B	WET/22267		
10156716002	**CMMW-2**	SM 2320B	WET/22267		
10156716003	**CMMW-3**	SM 2320B	WET/22267		
10156716004	**CMMW-4**	SM 2320B	WET/22267		
10156716005	**CMMW-5**	SM 2320B	WET/22267		
10156716006	**CMMW-6**	SM 2320B	WET/22267		
10156716007	**CMMW-7**	SM 2320B	WET/22267		
10156716008	**CMMW-8**	SM 2320B	WET/22267		
10156716009	**CMMW-9**	SM 2320B	WET/22267		
10156716010	**FIELD DUPLICATE**	SM 2320B	WET/22267		
10156716001	**CMMW-1**	SM 2540C	WET/22274		
10156716002	**CMMW-2**	SM 2540C	WET/22274		
10156716003	**CMMW-3**	SM 2540C	WET/22274		
10156716004	**CMMW-4**	SM 2540C	WET/22274		
10156716005	**CMMW-5**	SM 2540C	WET/22274		
10156716006	**CMMW-6**	SM 2540C	WET/22274		
10156716007	**CMMW-7**	SM 2540C	WET/22274		

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QUALITY CONTROL DATA CROSS REFERENCE TABLE

Project: Black Pine Mine
Pace Project No.: 10156716

Lab ID	Sample ID	QC Batch Method	QC Batch	Analytical Method	Analytical Batch
10156716008	**CMMW-8**	SM 2540C	WET/22274		
10156716009	**CMMW-9**	SM 2540C	WET/22274		
10156716010	**FIELD DUPLICATE**	SM 2540C	WET/22274		

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CHAIN-OF-CUSTODY / Analytical Request Document

The Chain-of-Custody is a LEGAL DOCUMENT. All relevant fields must be completed accurately.

Page: 1 of 1

Section A Required Client Information:

Company: Herrera
Address: 101 E. Broadway Ste 610, Missoula, MT 59802
Email To: Khourk@herreramail.com
Phone: 406 721 4204 Fax:
Requested Due Date/TAT:

Section B Required Project Information:

Report To: Kevin Hourk
Copy To: Mark Donner mdonner@b.hydro.com
Purchase Order No.:
Project Name: Black Pine Mine
Project Number:

Section C Invoice Information:

Attention:
Company Name:
Address:
Pace Quote Reference:
Pace Project Manager: Denise Jensen
Pace Profile #:

REGULATORY AGENCY
☐ NPDES ☐ GROUND WATER ☐ DRINKING WATER
☐ UST ☐ RCRA ☐ OTHER
Site Location STATE: Montana

Section D Required Client Information

SAMPLE ID (A-Z, 0-9 / ,-) Sample IDs MUST BE UNIQUE

Valid Matrix Codes

MATRIX	CODE
DRINKING WATER	DW
WATER	WT
WASTE WATER	WW
PRODUCT	P
SOIL/SOLID	SL
OIL	OL
WIPE	WP
AIR	AR
OTHER	OT
TISSUE	TS

ITEM #	SAMPLE ID	MATRIX CODE (see valid codes to left)	SAMPLE TYPE (G=GRAB C=COMP)	COLLECTED COMPOSITE START DATE	COLLECTED COMPOSITE START TIME	COLLECTED COMPOSITE END/GRAB DATE	COLLECTED COMPOSITE END/GRAB TIME	SAMPLE TEMP AT COLLECTION	# OF CONTAINERS	Preservatives: Unpreserved	H_2SO_4	HNO_3	HCl	NaOH	$Na_2S_2O_3$	Methanol	Other	Y/N	Analysis Test: Dissolved metals*	TSS, sulfate	TDS, alkalinity	Residual Chlorine (Y/N)	Pace Project No./ Lab I.D.
1	CMMW-1	WT		5/5/11	1700				3	2		1						x	x	x			001
2	CMMW-2	WT			1730				3	2		1						x	x	x			002
3	CMMW-3	WT			1740				3	2		1						x	x	x			003
4	CMMW-4	WT			1610				3	2		1						x	x	x			004
5	CMMW-5	WT			1500				3	2		1						x	x	x			005
6	CMMW-6	WT			1850				3	2		1						x	x	x			006
7	CMMW-7	WT			1450				3	2		1						x	x	x			007
8	CMMW-8	WT			1410				3	2		1						x	x	x			008
9	CMMW-9	WT			1630				3	2		1						x	x	x			009
10	FIELD DUPLICATE	WT			—				3	2		1						x	x	x			010
11																							
12																							

ADDITIONAL COMMENTS	RELINQUISHED BY / AFFILIATION	DATE	TIME	ACCEPTED BY / AFFILIATION	DATE	TIME	SAMPLE CONDITIONS: Temp in °C	Received on Ice (Y/N)	Custody Sealed Cooler (Y/N)	Samples Intact (Y/N)
* dissolved metals = As Cd Cu Fe Pb Mn Zn Ca Mg Na K	THC	5/6/11	1400							
	Fedex	5/7/11	10:00	Eric Sabourin / Pace	5/7/11	10:00	2.4	Y	Y	Y

SAMPLER NAME AND SIGNATURE
PRINT Name of SAMPLER: Luke Duque II
SIGNATURE of SAMPLER: [signature] DATE Signed (MM/DD/YY): 5/5/11

*Important Note: By signing this form you are accepting Pace's NET 30 day payment terms and agreeing to late charges of 1.5% per month for any invoices not paid within 30 days.

Sample Condition Upon Receipt

Pace Analytical

Client Name: Herrera / MDEQ Project # 10156716

Courier: ☒ Fed Ex ☐ UPS ☐ USPS ☐ Client ☐ Commercial ☐ Pace Other _____

Tracking #: 8636069622768636795538109728

Custody Seal on Cooler/Box Present: ☒ yes ☐ no JG 5/9/11 Seals intact: ☒ yes ☐ no

Optional: Proj. Due Date: Proj. Name:

Packing Material: ☐ Bubble Wrap ☐ Bubble Bags ☒ None ☐ Other _____ Temp Blank: Yes X No _____

Thermometer Used 1383045 or 135 Type of Ice: (Wet) Blue None ☒ Samples on ice, cooling process has begun

Cooler Temperature 2.4 Biological Tissue is Frozen: Yes No

Temp should be above freezing to 6°C

Date and Initials of person examining contents: JG 5/9/11

		Comments:
Chain of Custody Present:	☒Yes ☐No ☐N/A	1.
Chain of Custody Filled Out:	☒Yes ☐No ☐N/A	2.
Chain of Custody Relinquished:	☒Yes ☐No ☐N/A	3.
Sampler Name & Signature on COC:	☒Yes ☐No ☐N/A	4.
Samples Arrived within Hold Time:	☒Yes ☐No ☐N/A	5.
Short Hold Time Analysis (<72hr):	☐Yes ☒No ☐N/A	6.
Rush Turn Around Time Requested:	☐Yes ☒No ☐N/A	7.
Sufficient Volume:	☒Yes ☐No ☐N/A	8.
Correct Containers Used:	☒Yes ☐No ☐N/A	9.
-Pace Containers Used:	☒Yes ☐No ☐N/A	
Containers Intact:	☒Yes ☐No ☐N/A	10.
Filtered volume received for Dissolved tests	☒Yes ☐No ☐N/A	11.
Sample Labels match COC:	☒Yes ☐No ☐N/A	12.
-Includes date/time/ID/Analysis Matrix: Water		
All containers needing acid/base preservation have been checked. Noncompliance are noted in 13.	☒Yes ☐No ☐N/A	13. ☒ HNO3 (1/1) ☐ H2SO4 ☐ NaOH ☐ HCl Samp #1-10
All containers needing preservation are found to be in compliance with EPA recommendation.	☒Yes ☐No ☐N/A	Initial when completed JG Lot # of added preservative
Exceptions: VOA,Coliform, TOC, Oil and Grease, WI-DRO (water)	☐Yes ☒No	
Samples checked for dechlorination:	☐Yes ☐No ☒N/A	14.
Headspace in VOA Vials (>6mm):	☐Yes ☐No ☒N/A	15.
Trip Blank Present:	☐Yes ☐No ☒N/A	16.
Trip Blank Custody Seals Present	☐Yes ☐No ☒N/A	
Pace Trip Blank Lot # (if purchased): _____		

Client Notification/ Resolution: Field Data Required? Y / N

Person Contacted: _____ Date/Time: _____

Comments/ Resolution: _____

Project Manager Review: _____ **Date:** 5/9/11

Note: Whenever there is a discrepancy affecting North Carolina compliance samples, a copy of this form will be sent to the North Carolina DEHNR Certification Office (i.e out of hold, incorrect preservative, out of temp, incorrect containers)

Pace Analytical Services, Inc.
602 S 25th Street
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October 06, 2011

Kevin Houck
Herrera Environmental Consultants
101 East Broadway, Suite 610
Missoula, MT 59802

RE: Project: 776-012-002 Black Pine Mine SW
Pace Project No.: 10158290

Dear Kevin Houck:
Enclosed are the analytical results for sample(s) received by the laboratory on May 24, 2011. The results relate only to the samples included in this report.

Analysis for dissolved metals was requested. However the samples were not filtered in the field and were received acid preserved at the laboratory. The samples were acid digested and the analytical results are equivalent to total metals.

REVISION - Add the cover letter comment regarding dissolved and total metals analysis.

REVISION-add hardness to sample CPS-8.

If you have any questions concerning this report, please feel free to contact me.

Sincerely,

Carol Davy

carol.davy@pacelabs.com
Project Manager

Enclosures

cc: Devin Clary, Montana Dept. of Environmental Quality
Jamie Mongoven, Montana Dept. of Environmental
Mark Donner, Trihydro

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CERTIFICATIONS

Project: 776-012-002 Black Pine Mine SW
Pace Project No.: 10158290

Minnesota Certification IDs

1700 Elm Street SE Suite 200, Minneapolis, MN 55414
A2LA Certification #: 2926.01
Alaska Certification #: UST-078
Alaska Certification #MN00064
Arizona Certification #: AZ-0014
Arkansas Certification #: 88-0680
California Certification #: 01155CA
EPA Region 8 Certification #: Pace
Florida/NELAP Certification #: E87605
Georgia Certification #: 959
Idaho Certification #: MN00064
Illinois Certification #: 200011
Iowa Certification #: 368
Kansas Certification #: E-10167
Louisiana Certification #: 03086
Louisiana Certification #: LA080009
Maine Certification #: 2007029
Maryland Certification #: 322
Michigan DEQ Certification #: 9909
Minnesota Certification #: 027-053-137
Mississippi Certification #: Pace
Montana Certification #: MT CERT0092
Nevada Certification #: MN_00064
Nebraska Certification #: Pace
New Jersey Certification #: MN-002
New Mexico Certification #: Pace
New York Certification #: 11647
North Carolina Certification #: 530
North Dakota Certification #: R-036
North Dakota Certification #: R-036A
Ohio VAP Certification #: CL101
Oklahoma Certification #: D9921
Oklahoma Certification #: 9507
Oregon Certification #: MN200001
Pennsylvania Certification #: 68-00563
Puerto Rico Certification
Tennessee Certification #: 02818
Texas Certification #: T104704192
Washington Certification #: C754
Wisconsin Certification #: 999407970

Montana Certification IDs

602 South 25th Street, Billings, MT 59101
EPA Region 8 Certification #: 8TMS-Q
Idaho Certification #: MT00012
Montana Certification #: MT CERT0040
NVLAP Certification #: 101292-0
Minnesota Dept of Health Certification #: 030-999-442

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SAMPLE SUMMARY

Project: 776-012-002 Black Pine Mine SW
Pace Project No.: 10158290

Lab ID	Sample ID	Matrix	Date Collected	Date Received
10158290001	**CPS-1**	Water	05/19/11 13:10	05/24/11 10:25
10158290002	**CPS-10A**	Water	05/19/11 11:00	05/24/11 10:25
10158290003	**CPS-2**	Water	05/19/11 12:40	05/24/11 10:25
10158290004	**CPS-7A**	Water	05/19/11 15:15	05/24/11 10:25
10158290005	**CPS-8**	Water	05/19/11 14:55	05/24/11 10:25
10158290006	**CPSW-1**	Water	05/19/11 12:20	05/24/11 10:25
10158290007	**CPSW-2**	Water	05/19/11 11:55	05/24/11 10:25
10158290008	**NORTH RUNOFF**	Water	05/19/11 13:20	05/24/11 10:25
10158290009	**TSP-10**	Water	05/19/11 16:00	05/24/11 10:25
10158290010	**BD-1**	Water	05/19/11 00:00	05/24/11 10:25
10158290011	**CPS-10B**	Water	05/19/11 13:40	05/24/11 10:25
10158290012	**CPS-11**	Water	05/19/11 13:50	05/24/11 10:25
10158290013	**ROAD CUT**	Water	05/19/11 16:20	05/24/11 10:25

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SAMPLE ANALYTE COUNT

Project: 776-012-002 Black Pine Mine SW
Pace Project No.: 10158290

Lab ID	Sample ID	Method	Analysts	Analytes Reported	Laboratory
10158290001	**CPS-1**	EPA 200.8	RJS	11	PASI-M
		SM 2310	CAC	1	PASI-MT
		SM 2540D	MP3	1	PASI-MT
		EPA 300.0	JH1	1	PASI-MT
		SM 2320B	MWD	1	PASI-M
		SM 2540C	AS1	1	PASI-M
10158290002	**CPS-10A**	EPA 200.8	RJS	11	PASI-M
		SM 2310	CAC	1	PASI-MT
		SM 2540D	MP3	1	PASI-MT
		EPA 300.0	JH1	1	PASI-MT
		SM 2320B	MWD	1	PASI-M
		SM 2540C	AS1	1	PASI-M
10158290003	**CPS-2**	EPA 200.8	RJS	11	PASI-M
		SM 2310	CAC	1	PASI-MT
		SM 2540D	MP3	1	PASI-MT
		EPA 300.0	JH1	1	PASI-MT
		SM 2320B	MWD	1	PASI-M
		SM 2540C	AS1	1	PASI-M
10158290004	**CPS-7A**	EPA 200.8	RJS	11	PASI-M
		SM 2310	CAC	1	PASI-MT
		SM 2540D	MP3	1	PASI-MT
		EPA 300.0	JH1	1	PASI-MT
		SM 2320B	MWD	1	PASI-M
		SM 2540C	AS1	1	PASI-M
10158290005	**CPS-8**	EPA 200.8	RJS	12	PASI-M
		SM 2310	CAC	1	PASI-MT
		SM 2540D	MP3	1	PASI-MT
		EPA 300.0	JH1	1	PASI-MT
		SM 2320B	MWD	1	PASI-M
		SM 2540C	AS1	1	PASI-M
10158290006	**CPSW-1**	EPA 200.8	RJS	11	PASI-M
		SM 2310	CAC	1	PASI-MT
		SM 2540D	MP3	1	PASI-MT
		EPA 300.0	JH1	1	PASI-MT
		SM 2320B	MWD	1	PASI-M
		SM 2540C	AS1	1	PASI-M
10158290007	**CPSW-2**	EPA 200.8	RJS	11	PASI-M

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SAMPLE ANALYTE COUNT

Project: 776-012-002 Black Pine Mine SW
Pace Project No.: 10158290

Lab ID	Sample ID	Method	Analysts	Analytes Reported	Laboratory
		SM 2310	CAC	1	PASI-MT
		SM 2540D	MP3	1	PASI-MT
		EPA 300.0	JH1	1	PASI-MT
		SM 2320B	MWD	1	PASI-M
		SM 2540C	AS1	1	PASI-M
10158290008	**NORTH RUNOFF**	EPA 200.8	RJS	11	PASI-M
		SM 2310	CAC	1	PASI-MT
		SM 2540D	MP3	1	PASI-MT
		EPA 300.0	JH1	1	PASI-MT
		SM 2320B	MWD	1	PASI-M
		SM 2540C	AS1	1	PASI-M
10158290009	**TSP-10**	EPA 200.8	RJS	11	PASI-M
		SM 2310	CAC	1	PASI-MT
		SM 2540D	MP3	1	PASI-MT
		EPA 300.0	JH1	1	PASI-MT
		SM 2320B	MWD	1	PASI-M
		SM 2540C	AS1	1	PASI-M
10158290010	**BD-1**	EPA 200.8	RJS	11	PASI-M
		SM 2310	CAC	1	PASI-MT
		SM 2540D	MP3	1	PASI-MT
		EPA 300.0	JH1	1	PASI-MT
		SM 2320B	MWD	1	PASI-M
		SM 2540C	CAP	1	PASI-M
10158290011	**CPS-10B**	EPA 200.8	RJS	11	PASI-M
		SM 2310	CAC	1	PASI-MT
		SM 2540D	MP3	1	PASI-MT
		EPA 300.0	JH1	1	PASI-MT
		SM 2320B	MWD	1	PASI-M
		SM 2540C	CAP	1	PASI-M
10158290012	**CPS-11**	EPA 200.8	RJS	11	PASI-M
		SM 2310	CAC	1	PASI-MT
		SM 2540D	MP3	1	PASI-MT
		EPA 300.0	JH1	1	PASI-MT
		SM 2320B	MWD	1	PASI-M
		SM 2540C	CAP	1	PASI-M
10158290013	**ROAD CUT**	EPA 200.8	RJS	11	PASI-M
		SM 2310	CAC	1	PASI-MT

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SAMPLE ANALYTE COUNT

Project: 776-012-002 Black Pine Mine SW
Pace Project No.: 10158290

Lab ID	Sample ID	Method	Analysts	Analytes Reported	Laboratory
		SM 2540D	MP3	1	PASI-MT
		EPA 300.0	JH1	1	PASI-MT
		SM 2320B	MWD	1	PASI-M
		SM 2540C	CAP	1	PASI-M

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PROJECT NARRATIVE

Project: 776-012-002 Black Pine Mine SW
Pace Project No.: 10158290

Method: **EPA 200.8**
Description: 200.8 MET ICPMS, Dissolved
Client: Montana Dept. of Environmental Quality
Date: October 06, 2011

General Information:
13 samples were analyzed for EPA 200.8. All samples were received in acceptable condition with any exceptions noted below.

Hold Time:
The samples were analyzed within the method required hold times with any exceptions noted below.

Sample Preparation:
The samples were prepared in accordance with EPA 200.8 with any exceptions noted below.

Initial Calibrations (including MS Tune as applicable):
All criteria were within method requirements with any exceptions noted below.

Continuing Calibration:
All criteria were within method requirements with any exceptions noted below.

Internal Standards:
All internal standards were within QC limits with any exceptions noted below.

Method Blank:
All analytes were below the report limit in the method blank with any exceptions noted below.

Laboratory Control Spike:
All laboratory control spike compounds were within QC limits with any exceptions noted below.

Matrix Spikes:
All percent recoveries and relative percent differences (RPDs) were within acceptance criteria with any exceptions noted below.

QC Batch: MPRP/26262

A matrix spike and matrix spike duplicate (MS/MSD) were performed on the following sample(s): 10158057002,10158290007

M1: Matrix spike recovery exceeded QC limits. Batch accepted based on laboratory control sample (LCS) recovery.

- MS (Lab ID: 982837)
  - Calcium, Dissolved
- MS (Lab ID: 982838)
  - Calcium, Dissolved
  - Iron, Dissolved
  - Magnesium, Dissolved
  - Potassium, Dissolved
  - Zinc, Dissolved
- MSD (Lab ID: 982839)
  - Calcium, Dissolved
  - Copper, Dissolved
  - Iron, Dissolved
  - Magnesium, Dissolved
  - Potassium, Dissolved

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PROJECT NARRATIVE

Project: 776-012-002 Black Pine Mine SW
Pace Project No.: 10158290

Method: **EPA 200.8**
Description: 200.8 MET ICPMS, Dissolved
Client: Montana Dept. of Environmental Quality
Date: October 06, 2011

QC Batch: MPRP/26262

A matrix spike and matrix spike duplicate (MS/MSD) were performed on the following sample(s): 10158057002,10158290007

M1: Matrix spike recovery exceeded QC limits. Batch accepted based on laboratory control sample (LCS) recovery.

- Sodium, Dissolved
- Zinc, Dissolved

Duplicate Sample:
All duplicate sample results were within method acceptance criteria with any exceptions noted below.

Additional Comments:

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PROJECT NARRATIVE

Project: 776-012-002 Black Pine Mine SW
Pace Project No.: 10158290

Method: **SM 2310**
Description: 2310 Acidity
Client: Montana Dept. of Environmental Quality
Date: October 06, 2011

General Information:
13 samples were analyzed for SM 2310. All samples were received in acceptable condition with any exceptions noted below.

Hold Time:
The samples were analyzed within the method required hold times with any exceptions noted below.

Initial Calibrations (including MS Tune as applicable):
All criteria were within method requirements with any exceptions noted below.

Continuing Calibration:
All criteria were within method requirements with any exceptions noted below.

Internal Standards:
All internal standards were within QC limits with any exceptions noted below.

Surrogates:
All surrogates were within QC limits with any exceptions noted below.

Method Blank:
All analytes were below the report limit in the method blank with any exceptions noted below.

Laboratory Control Spike:
All laboratory control spike compounds were within QC limits with any exceptions noted below.

Matrix Spikes:
All percent recoveries and relative percent differences (RPDs) were within acceptance criteria with any exceptions noted below.

Duplicate Sample:
All duplicate sample results were within method acceptance criteria with any exceptions noted below.

QC Batch: MT/6058

R1: RPD value was outside control limits.

- DUP (Lab ID: 983751)
  - Acidity

Additional Comments:

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PROJECT NARRATIVE

Project: 776-012-002 Black Pine Mine SW
Pace Project No.: 10158290

Method: **SM 2540D**
Description: 2540D Total Suspended Solids
Client: Montana Dept. of Environmental Quality
Date: October 06, 2011

General Information:
13 samples were analyzed for SM 2540D. All samples were received in acceptable condition with any exceptions noted below.

Hold Time:
The samples were analyzed within the method required hold times with any exceptions noted below.

Initial Calibrations (including MS Tune as applicable):
All criteria were within method requirements with any exceptions noted below.

Continuing Calibration:
All criteria were within method requirements with any exceptions noted below.

Internal Standards:
All internal standards were within QC limits with any exceptions noted below.

Surrogates:
All surrogates were within QC limits with any exceptions noted below.

Method Blank:
All analytes were below the report limit in the method blank with any exceptions noted below.

Laboratory Control Spike:
All laboratory control spike compounds were within QC limits with any exceptions noted below.

Matrix Spikes:
All percent recoveries and relative percent differences (RPDs) were within acceptance criteria with any exceptions noted below.

Duplicate Sample:
All duplicate sample results were within method acceptance criteria with any exceptions noted below.

QC Batch: MT/6046

D6: The relative percent difference (RPD) between the sample and sample duplicate exceeded laboratory control limits.

- DUP (Lab ID: 982519)
  - Total Suspended Solids

Additional Comments:

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PROJECT NARRATIVE

Project: 776-012-002 Black Pine Mine SW
Pace Project No.: 10158290

Method: **EPA 300.0**
Description: 300.0 IC Anions
Client: Montana Dept. of Environmental Quality
Date: October 06, 2011

General Information:
13 samples were analyzed for EPA 300.0. All samples were received in acceptable condition with any exceptions noted below.

Hold Time:
The samples were analyzed within the method required hold times with any exceptions noted below.

Initial Calibrations (including MS Tune as applicable):
All criteria were within method requirements with any exceptions noted below.

Continuing Calibration:
All criteria were within method requirements with any exceptions noted below.

Internal Standards:
All internal standards were within QC limits with any exceptions noted below.

Surrogates:
All surrogates were within QC limits with any exceptions noted below.

Method Blank:
All analytes were below the report limit in the method blank with any exceptions noted below.

Laboratory Control Spike:
All laboratory control spike compounds were within QC limits with any exceptions noted below.

Matrix Spikes:
All percent recoveries and relative percent differences (RPDs) were within acceptance criteria with any exceptions noted below.

Duplicate Sample:
All duplicate sample results were within method acceptance criteria with any exceptions noted below.

Additional Comments:

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PROJECT NARRATIVE

Project: 776-012-002 Black Pine Mine SW
Pace Project No.: 10158290

Method: **SM 2320B**
Description: 2320B Alkalinity
Client: Montana Dept. of Environmental Quality
Date: October 06, 2011

General Information:
13 samples were analyzed for SM 2320B. All samples were received in acceptable condition with any exceptions noted below.

Hold Time:
The samples were analyzed within the method required hold times with any exceptions noted below.

Method Blank:
All analytes were below the report limit in the method blank with any exceptions noted below.

Laboratory Control Spike:
All laboratory control spike compounds were within QC limits with any exceptions noted below.

Matrix Spikes:
All percent recoveries and relative percent differences (RPDs) were within acceptance criteria with any exceptions noted below.

Duplicate Sample:
All duplicate sample results were within method acceptance criteria with any exceptions noted below.

Additional Comments:

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PROJECT NARRATIVE

Project: 776-012-002 Black Pine Mine SW
Pace Project No.: 10158290

Method: **SM 2540C**
Description: 2540C Total Dissolved Solids
Client: Montana Dept. of Environmental Quality
Date: October 06, 2011

General Information:
13 samples were analyzed for SM 2540C. All samples were received in acceptable condition with any exceptions noted below.

Hold Time:
The samples were analyzed within the method required hold times with any exceptions noted below.

Method Blank:
All analytes were below the report limit in the method blank with any exceptions noted below.

Laboratory Control Spike:
All laboratory control spike compounds were within QC limits with any exceptions noted below.

Matrix Spikes:
All percent recoveries and relative percent differences (RPDs) were within acceptance criteria with any exceptions noted below.

Duplicate Sample:
All duplicate sample results were within method acceptance criteria with any exceptions noted below.

Additional Comments:

This data package has been reviewed for quality and completeness and is approved for release.

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ANALYTICAL RESULTS

Project: 776-012-002 Black Pine Mine SW
Pace Project No.: 10158290

Sample: CPS-1 **Lab ID: 10158290001** Collected: 05/19/11 13:10 Received: 05/24/11 10:25 Matrix: Water

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
200.8 MET ICPMS, Dissolved	Analytical Method: EPA 200.8 Preparation Method: EPA 200.8							
Arsenic, Dissolved	**<0.50**	ug/L	0.50	1	05/25/11 14:56	05/27/11 19:08	7440-38-2	
Cadmium, Dissolved	**173**	ug/L	0.080	1	05/25/11 14:56	05/27/11 19:08	7440-43-9	
Calcium, Dissolved	**65400**	ug/L	100	5	05/25/11 14:56	05/27/11 19:13	7440-70-2	
Copper, Dissolved	**11100**	ug/L	25.0	50	05/25/11 14:56	05/31/11 13:22	7440-50-8	
Iron, Dissolved	**<50.0**	ug/L	50.0	1	05/25/11 14:56	05/27/11 19:08	7439-89-6	
Lead, Dissolved	**0.30**	ug/L	0.10	1	05/25/11 14:56	05/27/11 19:08	7439-92-1	
Magnesium, Dissolved	**27300**	ug/L	25.0	5	05/25/11 14:56	05/27/11 19:13	7439-95-4	
Manganese, Dissolved	**3680**	ug/L	25.0	50	05/25/11 14:56	05/31/11 13:22	7439-96-5	
Potassium, Dissolved	**3690**	ug/L	20.0	1	05/25/11 14:56	05/27/11 19:08	7440-09-7	
Sodium, Dissolved	**6450**	ug/L	50.0	1	05/25/11 14:56	05/27/11 19:08	7440-23-5	
Zinc, Dissolved	**12600**	ug/L	250	50	05/25/11 14:56	05/31/11 13:22	7440-66-6	
2310 Acidity	Analytical Method: SM 2310							
Acidity	**84.8**	mg/L	5.0	1		05/27/11 17:20		
2540D Total Suspended Solids	Analytical Method: SM 2540D							
Total Suspended Solids	**1.2**	mg/L	1.0	1		05/25/11 11:00		
300.0 IC Anions	Analytical Method: EPA 300.0							
Sulfate	**294**	mg/L	25.0	25		05/31/11 22:01	14808-79-8	
2320B Alkalinity	Analytical Method: SM 2320B							
Alkalinity, Total as CaCO3	**<5.0**	mg/L	5.0	1		05/26/11 11:39		
2540C Total Dissolved Solids	Analytical Method: SM 2540C							
Total Dissolved Solids	**584**	mg/L	10.0	1		05/25/11 14:08		

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ANALYTICAL RESULTS

Project: 776-012-002 Black Pine Mine SW
Pace Project No.: 10158290

Sample: CPS-10A **Lab ID: 10158290002** Collected: 05/19/11 11:00 Received: 05/24/11 10:25 Matrix: Water

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
200.8 MET ICPMS, Dissolved	Analytical Method: EPA 200.8 Preparation Method: EPA 200.8							
Arsenic, Dissolved	**2.9**	ug/L	0.50	1	05/25/11 14:56	05/27/11 19:18	7440-38-2	
Cadmium, Dissolved	**215**	ug/L	0.080	1	05/25/11 14:56	05/27/11 19:18	7440-43-9	
Calcium, Dissolved	**20000**	ug/L	20.0	1	05/25/11 14:56	05/27/11 19:18	7440-70-2	
Copper, Dissolved	**20900**	ug/L	25.0	50	05/25/11 14:56	05/31/11 02:34	7440-50-8	
Iron, Dissolved	**1140**	ug/L	50.0	1	05/25/11 14:56	05/27/11 19:18	7439-89-6	
Lead, Dissolved	**34.3**	ug/L	0.10	1	05/25/11 14:56	05/27/11 19:18	7439-92-1	
Magnesium, Dissolved	**9020**	ug/L	5.0	1	05/25/11 14:56	05/27/11 19:18	7439-95-4	
Manganese, Dissolved	**6640**	ug/L	25.0	50	05/25/11 14:56	05/31/11 02:34	7439-96-5	
Potassium, Dissolved	**2100**	ug/L	20.0	1	05/25/11 14:56	05/27/11 19:18	7440-09-7	
Sodium, Dissolved	**4180**	ug/L	50.0	1	05/25/11 14:56	05/27/11 19:18	7440-23-5	
Zinc, Dissolved	**20400**	ug/L	250	50	05/25/11 14:56	05/31/11 02:34	7440-66-6	
2310 Acidity	Analytical Method: SM 2310							
Acidity	**75.7**	mg/L	5.0	1		05/27/11 17:20		
2540D Total Suspended Solids	Analytical Method: SM 2540D							
Total Suspended Solids	**76.8**	mg/L	2.0	1		05/25/11 11:00		
300.0 IC Anions	Analytical Method: EPA 300.0							
Sulfate	**169**	mg/L	5.0	5		05/31/11 22:58	14808-79-8	
2320B Alkalinity	Analytical Method: SM 2320B							
Alkalinity, Total as CaCO3	**<5.0**	mg/L	5.0	1		05/26/11 11:41		
2540C Total Dissolved Solids	Analytical Method: SM 2540C							
Total Dissolved Solids	**284**	mg/L	10.0	1		05/25/11 14:09		

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ANALYTICAL RESULTS

Project: 776-012-002 Black Pine Mine SW
Pace Project No.: 10158290

Sample: CPS-2 **Lab ID: 10158290003** Collected: 05/19/11 12:40 Received: 05/24/11 10:25 Matrix: Water

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
200.8 MET ICPMS, Dissolved	Analytical Method: EPA 200.8 Preparation Method: EPA 200.8							
Arsenic, Dissolved	**3.5**	ug/L	0.50	1	05/25/11 14:56	05/27/11 19:37	7440-38-2	
Cadmium, Dissolved	**0.17**	ug/L	0.080	1	05/25/11 14:56	05/27/11 19:37	7440-43-9	
Calcium, Dissolved	**5160**	ug/L	20.0	1	05/25/11 14:56	05/27/11 19:37	7440-70-2	
Copper, Dissolved	**21.2**	ug/L	0.50	1	05/25/11 14:56	05/27/11 19:37	7440-50-8	
Iron, Dissolved	**1580**	ug/L	50.0	1	05/25/11 14:56	05/27/11 19:37	7439-89-6	
Lead, Dissolved	**6.6**	ug/L	0.10	1	05/25/11 14:56	05/27/11 19:37	7439-92-1	
Magnesium, Dissolved	**1760**	ug/L	5.0	1	05/25/11 14:56	05/27/11 19:37	7439-95-4	
Manganese, Dissolved	**13.9**	ug/L	0.50	1	05/25/11 14:56	05/27/11 19:37	7439-96-5	
Potassium, Dissolved	**1660**	ug/L	20.0	1	05/25/11 14:56	05/27/11 19:37	7440-09-7	
Sodium, Dissolved	**3000**	ug/L	100	2	05/25/11 14:56	05/31/11 02:39	7440-23-5	
Zinc, Dissolved	**20.2**	ug/L	5.0	1	05/25/11 14:56	05/27/11 19:37	7440-66-6	
2310 Acidity	Analytical Method: SM 2310							
Acidity	**17.9**	mg/L	5.0	1		05/27/11 17:20		
2540D Total Suspended Solids	Analytical Method: SM 2540D							
Total Suspended Solids	**2.2**	mg/L	1.0	1		05/25/11 11:00		
300.0 IC Anions	Analytical Method: EPA 300.0							
Sulfate	**6.1**	mg/L	2.0	2		05/27/11 16:55	14808-79-8	
2320B Alkalinity	Analytical Method: SM 2320B							
Alkalinity, Total as CaCO3	**16.4**	mg/L	5.0	1		05/26/11 11:46		
2540C Total Dissolved Solids	Analytical Method: SM 2540C							
Total Dissolved Solids	**98.0**	mg/L	10.0	1		05/25/11 14:10		

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ANALYTICAL RESULTS

Project: 776-012-002 Black Pine Mine SW
Pace Project No.: 10158290

Sample: CPS-7A **Lab ID: 10158290004** Collected: 05/19/11 15:15 Received: 05/24/11 10:25 Matrix: Water

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
200.8 MET ICPMS, Dissolved	Analytical Method: EPA 200.8 Preparation Method: EPA 200.8							
Arsenic, Dissolved	**54.7**	ug/L	0.50	1	05/25/11 14:56	05/27/11 19:47	7440-38-2	
Cadmium, Dissolved	**52.9**	ug/L	0.080	1	05/25/11 14:56	05/27/11 19:47	7440-43-9	
Calcium, Dissolved	**28200**	ug/L	100	5	05/25/11 14:56	05/27/11 19:51	7440-70-2	
Copper, Dissolved	**4320**	ug/L	5.0	10	05/25/11 14:56	05/31/11 02:44	7440-50-8	
Iron, Dissolved	**41400**	ug/L	250	5	05/25/11 14:56	05/27/11 19:51	7439-89-6	
Lead, Dissolved	**363**	ug/L	0.10	1	05/25/11 14:56	05/27/11 19:47	7439-92-1	
Magnesium, Dissolved	**16700**	ug/L	5.0	1	05/25/11 14:56	05/27/11 19:47	7439-95-4	
Manganese, Dissolved	**938**	ug/L	2.5	5	05/25/11 14:56	05/27/11 19:51	7439-96-5	
Potassium, Dissolved	**7140**	ug/L	20.0	1	05/25/11 14:56	05/27/11 19:47	7440-09-7	
Sodium, Dissolved	**3720**	ug/L	250	5	05/25/11 14:56	05/27/11 19:51	7440-23-5	
Zinc, Dissolved	**4650**	ug/L	250	50	05/25/11 14:56	05/31/11 13:27	7440-66-6	
2310 Acidity	Analytical Method: SM 2310							
Acidity	**37.3**	mg/L	5.0	1		05/27/11 17:20		R1
2540D Total Suspended Solids	Analytical Method: SM 2540D							
Total Suspended Solids	**2670**	mg/L	20.4	1		05/25/11 11:00		
300.0 IC Anions	Analytical Method: EPA 300.0							
Sulfate	**75.6**	mg/L	5.0	5		05/27/11 18:29	14808-79-8	
2320B Alkalinity	Analytical Method: SM 2320B							
Alkalinity, Total as CaCO3	**<5.0**	mg/L	5.0	1		05/26/11 11:49		
2540C Total Dissolved Solids	Analytical Method: SM 2540C							
Total Dissolved Solids	**320**	mg/L	33.3	1		05/25/11 14:10		

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ANALYTICAL RESULTS

Project: 776-012-002 Black Pine Mine SW
Pace Project No.: 10158290

Sample: CPS-8 **Lab ID: 10158290005** Collected: 05/19/11 14:55 Received: 05/24/11 10:25 Matrix: Water

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
200.8 MET ICPMS, Dissolved	Analytical Method: EPA 200.8 Preparation Method: EPA 200.8							
Arsenic, Dissolved	**3.8**	ug/L	0.50	1	05/25/11 14:56	05/27/11 19:56	7440-38-2	
Cadmium, Dissolved	**7.8**	ug/L	0.080	1	05/25/11 14:56	05/27/11 19:56	7440-43-9	
Calcium, Dissolved	**10300**	ug/L	20.0	1	05/25/11 14:56	05/27/11 19:56	7440-70-2	
Copper, Dissolved	**339**	ug/L	0.50	1	05/25/11 14:56	05/27/11 19:56	7440-50-8	
Iron, Dissolved	**1950**	ug/L	50.0	1	05/25/11 14:56	05/27/11 19:56	7439-89-6	
Lead, Dissolved	**7.7**	ug/L	0.10	1	05/25/11 14:56	05/27/11 19:56	7439-92-1	
Magnesium, Dissolved	**3820**	ug/L	5.0	1	05/25/11 14:56	05/27/11 19:56	7439-95-4	
Manganese, Dissolved	**31.9**	ug/L	0.50	1	05/25/11 14:56	05/27/11 19:56	7439-96-5	
Potassium, Dissolved	**1770**	ug/L	20.0	1	05/25/11 14:56	05/27/11 19:56	7440-09-7	
Sodium, Dissolved	**3900**	ug/L	100	2	05/25/11 14:56	05/31/11 02:58	7440-23-5	
Total Hardness by 2340B, Dissolved	**41500**	ug/L	71.0	1	05/25/11 14:56	05/27/11 19:56		
Zinc, Dissolved	**361**	ug/L	5.0	1	05/25/11 14:56	05/27/11 19:56	7440-66-6	
2310 Acidity	Analytical Method: SM 2310							
Acidity	**23.7**	mg/L	5.0	1		05/27/11 17:20		
2540D Total Suspended Solids	Analytical Method: SM 2540D							
Total Suspended Solids	**258**	mg/L	4.1	1		05/25/11 11:00		
300.0 IC Anions	Analytical Method: EPA 300.0							
Sulfate	**19.6**	mg/L	3.0	3		05/27/11 18:57	14808-79-8	
2320B Alkalinity	Analytical Method: SM 2320B							
Alkalinity, Total as CaCO3	**22.5**	mg/L	5.0	1		05/26/11 11:51		
2540C Total Dissolved Solids	Analytical Method: SM 2540C							
Total Dissolved Solids	**122**	mg/L	20.0	1		05/25/11 14:11		

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ANALYTICAL RESULTS

Project: 776-012-002 Black Pine Mine SW
Pace Project No.: 10158290

Sample: CPSW-1 **Lab ID: 10158290006** Collected: 05/19/11 12:20 Received: 05/24/11 10:25 Matrix: Water

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
200.8 MET ICPMS, Dissolved	Analytical Method: EPA 200.8 Preparation Method: EPA 200.8							
Arsenic, Dissolved	**3.1**	ug/L	0.50	1	05/25/11 14:56	05/27/11 20:35	7440-38-2	
Cadmium, Dissolved	**2.2**	ug/L	0.080	1	05/25/11 14:56	05/27/11 20:35	7440-43-9	
Calcium, Dissolved	**6200**	ug/L	20.0	1	05/25/11 14:56	05/27/11 20:35	7440-70-2	
Copper, Dissolved	**89.9**	ug/L	0.50	1	05/25/11 14:56	05/27/11 20:35	7440-50-8	
Iron, Dissolved	**1380**	ug/L	50.0	1	05/25/11 14:56	05/27/11 20:35	7439-89-6	
Lead, Dissolved	**4.6**	ug/L	0.10	1	05/25/11 14:56	05/27/11 20:35	7439-92-1	
Magnesium, Dissolved	**2130**	ug/L	5.0	1	05/25/11 14:56	05/27/11 20:35	7439-95-4	
Manganese, Dissolved	**26.7**	ug/L	0.50	1	05/25/11 14:56	05/27/11 20:35	7439-96-5	
Potassium, Dissolved	**1920**	ug/L	20.0	1	05/25/11 14:56	05/27/11 20:35	7440-09-7	
Sodium, Dissolved	**3200**	ug/L	100	2	05/25/11 14:56	05/31/11 03:03	7440-23-5	
Zinc, Dissolved	**184**	ug/L	5.0	1	05/25/11 14:56	05/27/11 20:35	7440-66-6	
2310 Acidity	Analytical Method: SM 2310							
Acidity	**26.6**	mg/L	5.0	1		05/27/11 17:20		
2540D Total Suspended Solids	Analytical Method: SM 2540D							
Total Suspended Solids	**5.0**	mg/L	1.3	1		05/25/11 11:00		
300.0 IC Anions	Analytical Method: EPA 300.0							
Sulfate	**14.8**	mg/L	2.0	2		05/27/11 20:51	14808-79-8	
2320B Alkalinity	Analytical Method: SM 2320B							
Alkalinity, Total as CaCO3	**12.8**	mg/L	5.0	1		05/26/11 12:02		
2540C Total Dissolved Solids	Analytical Method: SM 2540C							
Total Dissolved Solids	**104**	mg/L	10.0	1		05/25/11 14:12		

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ANALYTICAL RESULTS

Project: 776-012-002 Black Pine Mine SW
Pace Project No.: 10158290

Sample: CPSW-2 **Lab ID: 10158290007** Collected: 05/19/11 11:55 Received: 05/24/11 10:25 Matrix: Water

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
200.8 MET ICPMS, Dissolved	Analytical Method: EPA 200.8 Preparation Method: EPA 200.8							
Arsenic, Dissolved	**2.3**	ug/L	0.50	1	05/25/11 14:56	05/27/11 20:06	7440-38-2	
Cadmium, Dissolved	**2.3**	ug/L	0.080	1	05/25/11 14:56	05/27/11 20:06	7440-43-9	
Calcium, Dissolved	**6960**	ug/L	20.0	1	05/25/11 14:56	05/27/11 20:06	7440-70-2	M1
Copper, Dissolved	**126**	ug/L	0.50	1	05/25/11 14:56	05/27/11 20:06	7440-50-8	M1
Iron, Dissolved	**777**	ug/L	50.0	1	05/25/11 14:56	05/27/11 20:06	7439-89-6	M1
Lead, Dissolved	**3.1**	ug/L	0.10	1	05/25/11 14:56	05/27/11 20:06	7439-92-1	
Magnesium, Dissolved	**2320**	ug/L	5.0	1	05/25/11 14:56	05/27/11 20:06	7439-95-4	M1
Manganese, Dissolved	**19.3**	ug/L	0.50	1	05/25/11 14:56	05/27/11 20:06	7439-96-5	
Potassium, Dissolved	**2030**	ug/L	20.0	1	05/25/11 14:56	05/27/11 20:06	7440-09-7	M1
Sodium, Dissolved	**3280**	ug/L	100	2	05/25/11 14:56	05/31/11 03:07	7440-23-5	M1
Zinc, Dissolved	**199**	ug/L	5.0	1	05/25/11 14:56	05/27/11 20:06	7440-66-6	M1
2310 Acidity	Analytical Method: SM 2310							
Acidity	**36.3**	mg/L	5.0	1		05/27/11 17:20		
2540D Total Suspended Solids	Analytical Method: SM 2540D							
Total Suspended Solids	**4.5**	mg/L	1.0	1		05/25/11 11:00		
300.0 IC Anions	Analytical Method: EPA 300.0							
Sulfate	**21.9**	mg/L	2.0	2		05/27/11 21:19	14808-79-8	
2320B Alkalinity	Analytical Method: SM 2320B							
Alkalinity, Total as CaCO3	**10.2**	mg/L	5.0	1		05/26/11 12:05		
2540C Total Dissolved Solids	Analytical Method: SM 2540C							
Total Dissolved Solids	**116**	mg/L	10.0	1		05/25/11 14:13		

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ANALYTICAL RESULTS

Project: 776-012-002 Black Pine Mine SW
Pace Project No.: 10158290

Sample: NORTH RUNOFF **Lab ID: 10158290008** Collected: 05/19/11 13:20 Received: 05/24/11 10:25 Matrix: Water

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
200.8 MET ICPMS, Dissolved	Analytical Method: EPA 200.8 Preparation Method: EPA 200.8							
Arsenic, Dissolved	**2.1**	ug/L	0.50	1	05/25/11 14:56	05/27/11 20:44	7440-38-2	
Cadmium, Dissolved	**17.9**	ug/L	0.080	1	05/25/11 14:56	05/27/11 20:44	7440-43-9	
Calcium, Dissolved	**16600**	ug/L	20.0	1	05/25/11 14:56	05/27/11 20:44	7440-70-2	
Copper, Dissolved	**666**	ug/L	2.5	5	05/25/11 14:56	05/31/11 03:22	7440-50-8	
Iron, Dissolved	**1460**	ug/L	50.0	1	05/25/11 14:56	05/27/11 20:44	7439-89-6	
Lead, Dissolved	**3.2**	ug/L	0.10	1	05/25/11 14:56	05/27/11 20:44	7439-92-1	
Magnesium, Dissolved	**6460**	ug/L	5.0	1	05/25/11 14:56	05/27/11 20:44	7439-95-4	
Manganese, Dissolved	**152**	ug/L	0.50	1	05/25/11 14:56	05/27/11 20:44	7439-96-5	
Potassium, Dissolved	**2210**	ug/L	20.0	1	05/25/11 14:56	05/27/11 20:44	7440-09-7	
Sodium, Dissolved	**3800**	ug/L	250	5	05/25/11 14:56	05/31/11 03:22	7440-23-5	
Zinc, Dissolved	**1310**	ug/L	25.0	5	05/25/11 14:56	05/31/11 03:22	7440-66-6	
2310 Acidity	Analytical Method: SM 2310							
Acidity	**36.3**	mg/L	5.0	1		05/27/11 17:20		
2540D Total Suspended Solids	Analytical Method: SM 2540D							
Total Suspended Solids	**26.9**	mg/L	1.0	1		05/25/11 11:00		
300.0 IC Anions	Analytical Method: EPA 300.0							
Sulfate	**60.5**	mg/L	2.0	2		05/27/11 21:48	14808-79-8	
2320B Alkalinity	Analytical Method: SM 2320B							
Alkalinity, Total as CaCO3	**10.5**	mg/L	5.0	1		05/26/11 12:09		
2540C Total Dissolved Solids	Analytical Method: SM 2540C							
Total Dissolved Solids	**161**	mg/L	10.0	1		05/25/11 14:13		

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ANALYTICAL RESULTS

Project: 776-012-002 Black Pine Mine SW
Pace Project No.: 10158290

Sample: TSP-10 **Lab ID: 10158290009** Collected: 05/19/11 16:00 Received: 05/24/11 10:25 Matrix: Water

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
200.8 MET ICPMS, Dissolved	Analytical Method: EPA 200.8 Preparation Method: EPA 200.8							
Arsenic, Dissolved	**2.0**	ug/L	0.50	1	05/25/11 14:56	05/27/11 20:54	7440-38-2	
Cadmium, Dissolved	**0.080**	ug/L	0.080	1	05/25/11 14:56	05/27/11 20:54	7440-43-9	
Calcium, Dissolved	**3280**	ug/L	20.0	1	05/25/11 14:56	05/27/11 20:54	7440-70-2	
Copper, Dissolved	**6.3**	ug/L	0.50	1	05/25/11 14:56	05/27/11 20:54	7440-50-8	
Iron, Dissolved	**2990**	ug/L	50.0	1	05/25/11 14:56	05/27/11 20:54	7439-89-6	
Lead, Dissolved	**2.7**	ug/L	0.10	1	05/25/11 14:56	05/27/11 20:54	7439-92-1	
Magnesium, Dissolved	**2130**	ug/L	5.0	1	05/25/11 14:56	05/27/11 20:54	7439-95-4	
Manganese, Dissolved	**52.6**	ug/L	0.50	1	05/25/11 14:56	05/27/11 20:54	7439-96-5	
Potassium, Dissolved	**1500**	ug/L	20.0	1	05/25/11 14:56	05/27/11 20:54	7440-09-7	
Sodium, Dissolved	**2050**	ug/L	100	2	05/25/11 14:56	05/31/11 03:27	7440-23-5	
Zinc, Dissolved	**17.1**	ug/L	5.0	1	05/25/11 14:56	05/27/11 20:54	7440-66-6	
2310 Acidity	Analytical Method: SM 2310							
Acidity	**<5.0**	mg/L	5.0	1		05/27/11 17:20		
2540D Total Suspended Solids	Analytical Method: SM 2540D							
Total Suspended Solids	**28.1**	mg/L	1.3	1		05/25/11 11:00		
300.0 IC Anions	Analytical Method: EPA 300.0							
Sulfate	**3.3**	mg/L	3.0	3		05/27/11 22:16	14808-79-8	
2320B Alkalinity	Analytical Method: SM 2320B							
Alkalinity, Total as CaCO3	**13.8**	mg/L	5.0	1		05/26/11 12:52		
2540C Total Dissolved Solids	Analytical Method: SM 2540C							
Total Dissolved Solids	**100**	mg/L	10.0	1		05/25/11 14:14		

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ANALYTICAL RESULTS

Project: 776-012-002 Black Pine Mine SW
Pace Project No.: 10158290

Sample: BD-1 **Lab ID: 10158290010** Collected: 05/19/11 00:00 Received: 05/24/11 10:25 Matrix: Water

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
200.8 MET ICPMS, Dissolved	Analytical Method: EPA 200.8 Preparation Method: EPA 200.8							
Arsenic, Dissolved	**2.0**	ug/L	0.50	1	05/25/11 14:56	05/27/11 21:03	7440-38-2	
Cadmium, Dissolved	**13.7**	ug/L	0.080	1	05/25/11 14:56	05/27/11 21:03	7440-43-9	
Calcium, Dissolved	**13600**	ug/L	20.0	1	05/25/11 14:56	05/27/11 21:03	7440-70-2	
Copper, Dissolved	**700**	ug/L	2.5	5	05/25/11 14:56	05/31/11 03:31	7440-50-8	
Iron, Dissolved	**1670**	ug/L	50.0	1	05/25/11 14:56	05/27/11 21:03	7439-89-6	
Lead, Dissolved	**3.3**	ug/L	0.10	1	05/25/11 14:56	05/27/11 21:03	7439-92-1	
Magnesium, Dissolved	**5290**	ug/L	5.0	1	05/25/11 14:56	05/27/11 21:03	7439-95-4	
Manganese, Dissolved	**118**	ug/L	0.50	1	05/25/11 14:56	05/27/11 21:03	7439-96-5	
Potassium, Dissolved	**2030**	ug/L	20.0	1	05/25/11 14:56	05/27/11 21:03	7440-09-7	
Sodium, Dissolved	**4130**	ug/L	250	5	05/25/11 14:56	05/31/11 03:31	7440-23-5	
Zinc, Dissolved	**1130**	ug/L	25.0	5	05/25/11 14:56	05/31/11 03:31	7440-66-6	
2310 Acidity	Analytical Method: SM 2310							
Acidity	**44.1**	mg/L	5.0	1		05/27/11 17:20		
2540D Total Suspended Solids	Analytical Method: SM 2540D							
Total Suspended Solids	**25.8**	mg/L	1.0	1		05/25/11 11:00		
300.0 IC Anions	Analytical Method: EPA 300.0							
Sulfate	**41.7**	mg/L	2.0	2		05/27/11 22:44	14808-79-8	
2320B Alkalinity	Analytical Method: SM 2320B							
Alkalinity, Total as CaCO3	**13.2**	mg/L	5.0	1		05/26/11 12:55		
2540C Total Dissolved Solids	Analytical Method: SM 2540C							
Total Dissolved Solids	**126**	mg/L	10.0	1		05/26/11 10:52		

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ANALYTICAL RESULTS

Project: 776-012-002 Black Pine Mine SW
Pace Project No.: 10158290

Sample: CPS-10B **Lab ID: 10158290011** Collected: 05/19/11 13:40 Received: 05/24/11 10:25 Matrix: Water

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
200.8 MET ICPMS, Dissolved	Analytical Method: EPA 200.8 Preparation Method: EPA 200.8							
Arsenic, Dissolved	**4.5**	ug/L	0.50	1	05/25/11 14:56	05/27/11 21:13	7440-38-2	
Cadmium, Dissolved	**132**	ug/L	0.080	1	05/25/11 14:56	05/27/11 21:13	7440-43-9	
Calcium, Dissolved	**58600**	ug/L	100	5	05/25/11 14:56	05/31/11 03:36	7440-70-2	
Copper, Dissolved	**8600**	ug/L	25.0	50	05/25/11 14:56	05/31/11 03:41	7440-50-8	
Iron, Dissolved	**4700**	ug/L	50.0	1	05/25/11 14:56	05/27/11 21:13	7439-89-6	
Lead, Dissolved	**9.2**	ug/L	0.10	1	05/25/11 14:56	05/27/11 21:13	7439-92-1	
Magnesium, Dissolved	**24300**	ug/L	25.0	5	05/25/11 14:56	05/31/11 03:36	7439-95-4	
Manganese, Dissolved	**2590**	ug/L	25.0	50	05/25/11 14:56	05/31/11 03:41	7439-96-5	
Potassium, Dissolved	**4630**	ug/L	20.0	1	05/25/11 14:56	05/27/11 21:13	7440-09-7	
Sodium, Dissolved	**6680**	ug/L	250	5	05/25/11 14:56	05/31/11 03:36	7440-23-5	
Zinc, Dissolved	**9720**	ug/L	250	50	05/25/11 14:56	05/31/11 03:41	7440-66-6	
2310 Acidity	Analytical Method: SM 2310							
Acidity	**40.2**	mg/L	5.0	1		05/27/11 17:20		
2540D Total Suspended Solids	Analytical Method: SM 2540D							
Total Suspended Solids	**644**	mg/L	2.7	1		05/25/11 11:00		
300.0 IC Anions	Analytical Method: EPA 300.0							
Sulfate	**266**	mg/L	5.0	5		05/31/11 17:17	14808-79-8	
2320B Alkalinity	Analytical Method: SM 2320B							
Alkalinity, Total as CaCO3	**<5.0**	mg/L	5.0	1		05/26/11 12:57		
2540C Total Dissolved Solids	Analytical Method: SM 2540C							
Total Dissolved Solids	**462**	mg/L	20.0	1		05/26/11 10:53		

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ANALYTICAL RESULTS

Project: 776-012-002 Black Pine Mine SW
Pace Project No.: 10158290

Sample: CPS-11 **Lab ID: 10158290012** Collected: 05/19/11 13:50 Received: 05/24/11 10:25 Matrix: Water

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
200.8 MET ICPMS, Dissolved	Analytical Method: EPA 200.8 Preparation Method: EPA 200.8							
Arsenic, Dissolved	**1.7**	ug/L	0.50	1	05/25/11 14:56	05/27/11 21:32	7440-38-2	
Cadmium, Dissolved	**13.4**	ug/L	0.080	1	05/25/11 14:56	05/27/11 21:32	7440-43-9	
Calcium, Dissolved	**13300**	ug/L	20.0	1	05/25/11 14:56	05/27/11 21:32	7440-70-2	
Copper, Dissolved	**638**	ug/L	2.5	5	05/25/11 14:56	05/27/11 21:37	7440-50-8	
Iron, Dissolved	**1340**	ug/L	50.0	1	05/25/11 14:56	05/27/11 21:32	7439-89-6	
Lead, Dissolved	**2.8**	ug/L	0.10	1	05/25/11 14:56	05/27/11 21:32	7439-92-1	
Magnesium, Dissolved	**5120**	ug/L	5.0	1	05/25/11 14:56	05/27/11 21:32	7439-95-4	
Manganese, Dissolved	**113**	ug/L	0.50	1	05/25/11 14:56	05/27/11 21:32	7439-96-5	
Potassium, Dissolved	**1930**	ug/L	20.0	1	05/25/11 14:56	05/27/11 21:32	7440-09-7	
Sodium, Dissolved	**3260**	ug/L	50.0	1	05/25/11 14:56	05/27/11 21:32	7440-23-5	
Zinc, Dissolved	**1010**	ug/L	25.0	5	05/25/11 14:56	05/27/11 21:37	7440-66-6	
2310 Acidity	Analytical Method: SM 2310							
Acidity	**34.4**	mg/L	5.0	1		05/27/11 17:20		
2540D Total Suspended Solids	Analytical Method: SM 2540D							
Total Suspended Solids	**21.0**	mg/L	1.0	1		05/25/11 11:00		
300.0 IC Anions	Analytical Method: EPA 300.0							
Sulfate	**28.5**	mg/L	2.0	2		05/27/11 23:41	14808-79-8	
2320B Alkalinity	Analytical Method: SM 2320B							
Alkalinity, Total as CaCO3	**12.9**	mg/L	5.0	1		05/26/11 13:00		
2540C Total Dissolved Solids	Analytical Method: SM 2540C							
Total Dissolved Solids	**144**	mg/L	10.0	1		05/26/11 10:54		

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ANALYTICAL RESULTS

Project: 776-012-002 Black Pine Mine SW
Pace Project No.: 10158290

Sample: ROAD CUT **Lab ID: 10158290013** Collected: 05/19/11 16:20 Received: 05/24/11 10:25 Matrix: Water

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
200.8 MET ICPMS, Dissolved	Analytical Method: EPA 200.8 Preparation Method: EPA 200.8							
Arsenic, Dissolved	**3.3**	ug/L	0.50	1	05/25/11 14:56	05/27/11 21:42	7440-38-2	
Cadmium, Dissolved	**<0.080**	ug/L	0.080	1	05/25/11 14:56	05/27/11 21:42	7440-43-9	
Calcium, Dissolved	**3190**	ug/L	20.0	1	05/25/11 14:56	05/27/11 21:42	7440-70-2	
Copper, Dissolved	**16.8**	ug/L	0.50	1	05/25/11 14:56	05/27/11 21:42	7440-50-8	
Iron, Dissolved	**1810**	ug/L	50.0	1	05/25/11 14:56	05/27/11 21:42	7439-89-6	
Lead, Dissolved	**5.3**	ug/L	0.10	1	05/25/11 14:56	05/27/11 21:42	7439-92-1	
Magnesium, Dissolved	**1560**	ug/L	5.0	1	05/25/11 14:56	05/27/11 21:42	7439-95-4	
Manganese, Dissolved	**16.0**	ug/L	0.50	1	05/25/11 14:56	05/27/11 21:42	7439-96-5	
Potassium, Dissolved	**1700**	ug/L	20.0	1	05/25/11 14:56	05/27/11 21:42	7440-09-7	
Sodium, Dissolved	**2270**	ug/L	50.0	1	05/25/11 14:56	05/27/11 21:42	7440-23-5	
Zinc, Dissolved	**9.2**	ug/L	5.0	1	05/25/11 14:56	05/27/11 21:42	7440-66-6	
2310 Acidity	Analytical Method: SM 2310							
Acidity	**11.1**	mg/L	5.0	1		05/27/11 17:20		
2540D Total Suspended Solids	Analytical Method: SM 2540D							
Total Suspended Solids	**7.3**	mg/L	1.0	1		05/25/11 11:00		
300.0 IC Anions	Analytical Method: EPA 300.0							
Sulfate	**6.7**	mg/L	5.0	5		05/28/11 00:10	14808-79-8	
2320B Alkalinity	Analytical Method: SM 2320B							
Alkalinity, Total as CaCO3	**13.1**	mg/L	5.0	1		05/26/11 13:03		
2540C Total Dissolved Solids	Analytical Method: SM 2540C							
Total Dissolved Solids	**58.0**	mg/L	10.0	1		05/26/11 10:54		

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Billings, MT 591014549
(406)254-7226

QUALITY CONTROL DATA

Project: 776-012-002 Black Pine Mine SW
Pace Project No.: 10158290

QC Batch: MPRP/26262 Analysis Method: EPA 200.8
QC Batch Method: EPA 200.8 Analysis Description: 200.8 MET Dissolved
Associated Lab Samples: 10158290001, 10158290002, 10158290003, 10158290004, 10158290005, 10158290006, 10158290007, 10158290008, 10158290009, 10158290010

METHOD BLANK: 982391 Matrix: Water
Associated Lab Samples: 10158290001, 10158290002, 10158290003, 10158290004, 10158290005, 10158290006, 10158290007, 10158290008, 10158290009, 10158290010, 10158290011, 10158290012, 10158290013

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Arsenic, Dissolved	ug/L	<0.50	0.50	05/31/11 02:29	
Cadmium, Dissolved	ug/L	<0.080	0.080	05/31/11 02:29	
Calcium, Dissolved	ug/L	<20.0	20.0	05/31/11 02:29	
Copper, Dissolved	ug/L	<0.50	0.50	05/31/11 02:29	
Iron, Dissolved	ug/L	<50.0	50.0	05/31/11 02:29	
Lead, Dissolved	ug/L	<0.10	0.10	05/31/11 02:29	
Magnesium, Dissolved	ug/L	<5.0	5.0	05/31/11 02:29	
Manganese, Dissolved	ug/L	<0.50	0.50	05/31/11 02:29	
Potassium, Dissolved	ug/L	<20.0	20.0	05/31/11 02:29	
Sodium, Dissolved	ug/L	<50.0	50.0	05/31/11 02:29	
Zinc, Dissolved	ug/L	<5.0	5.0	05/31/11 02:29	

LABORATORY CONTROL SAMPLE: 982392

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Arsenic, Dissolved	ug/L	80	81.1	101	85-115	
Cadmium, Dissolved	ug/L	80	79.3	99	85-115	
Calcium, Dissolved	ug/L	1000	956	96	85-115	
Copper, Dissolved	ug/L	80	79.5	99	85-115	
Iron, Dissolved	ug/L	1000	1020	102	85-115	
Lead, Dissolved	ug/L	80	77.8	97	85-115	
Magnesium, Dissolved	ug/L	1000	1020	102	85-115	
Manganese, Dissolved	ug/L	80	81.7	102	85-115	
Potassium, Dissolved	ug/L	1000	1010	101	85-115	
Sodium, Dissolved	ug/L	1000	943	94	85-115	
Zinc, Dissolved	ug/L	80	80.0	100	85-115	

MATRIX SPIKE SAMPLE: 982837

Parameter	Units	10158057002 Result	Spike Conc.	MS Result	MS % Rec	% Rec Limits	Qualifiers
Arsenic, Dissolved	ug/L	<0.50	80	81.6	102	70-130	
Cadmium, Dissolved	ug/L	0.00025 mg/L	80	81.8	102	70-130	
Calcium, Dissolved	ug/L	30200	1000	30800	58	70-130	M1
Copper, Dissolved	ug/L	0.0022 mg/L	80	81.2	99	70-130	
Iron, Dissolved	ug/L	0.12 mg/L	1000	1120	100	70-130	
Lead, Dissolved	ug/L	0.0019 mg/L	80	79.2	97	70-130	
Magnesium, Dissolved	ug/L	10300	1000	11600	130	70-130	
Manganese, Dissolved	ug/L	0.0021 mg/L	80	82.3	100	70-130	

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QUALITY CONTROL DATA

Project: 776-012-002 Black Pine Mine SW
Pace Project No.: 10158290

MATRIX SPIKE SAMPLE: 982837

Parameter	Units	10158057002 Result	Spike Conc.	MS Result	MS % Rec	% Rec Limits	Qualifiers
Potassium, Dissolved	ug/L	5670	1000	6760	108	70-130	
Sodium, Dissolved	ug/L	7700	1000	8680	97	70-130	
Zinc, Dissolved	ug/L	<0.0050 mg/L	80	83.4	99	70-130	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 982838 982839

Parameter	Units	10158290007 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Arsenic, Dissolved	ug/L	2.3	80	80	88.8	97.4	108	119	70-130	9	20	
Cadmium, Dissolved	ug/L	2.3	80	80	85.4	92.6	104	113	70-130	8	20	
Calcium, Dissolved	ug/L	6960	1000	1000	8590	9350	163	239	70-130	8	20	M1
Copper, Dissolved	ug/L	126	80	80	221	242	120	146	70-130	9	20	M1
Iron, Dissolved	ug/L	777	1000	1000	3190	3450	242	268	70-130	8	20	M1
Lead, Dissolved	ug/L	3.1	80	80	88.2	96.5	106	117	70-130	9	20	
Magnesium, Dissolved	ug/L	2320	1000	1000	3760	4080	143	176	70-130	8	20	M1
Manganese, Dissolved	ug/L	19.3	80	80	109	119	113	124	70-130	8	20	
Potassium, Dissolved	ug/L	2030	1000	1000	3690	3950	167	192	70-130	7	20	M1
Sodium, Dissolved	ug/L	3280	1000	1000	4440	4890	116	161	70-130	10	20	M1
Zinc, Dissolved	ug/L	199	80	80	308	343	137	180	70-130	11	20	M1

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QUALITY CONTROL DATA

Project: 776-012-002 Black Pine Mine SW
Pace Project No.: 10158290

QC Batch: MT/6058 Analysis Method: SM 2310
QC Batch Method: SM 2310 Analysis Description: 2310 Acidity
Associated Lab Samples: 10158290001, 10158290002, 10158290003, 10158290004, 10158290005, 10158290006, 10158290007, 10158290008, 10158290009, 10158290010, 10158290011, 10158290012, 10158290013

METHOD BLANK: 983749 Matrix: Water
Associated Lab Samples: 10158290001, 10158290002, 10158290003, 10158290004, 10158290005, 10158290006, 10158290007, 10158290008, 10158290009, 10158290010, 10158290011, 10158290012, 10158290013

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Acidity	mg/L	<5.0	5.0	05/27/11 17:20	

SAMPLE DUPLICATE: 983750

Parameter	Units	10158057001 Result	Dup Result	RPD	Max RPD	Qualifiers
Acidity	mg/L	<5.0	<5.0		20	

SAMPLE DUPLICATE: 983751

Parameter	Units	10158290004 Result	Dup Result	RPD	Max RPD	Qualifiers
Acidity	mg/L	37.3	46.0	21	20	R1

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QUALITY CONTROL DATA

Project: 776-012-002 Black Pine Mine SW
Pace Project No.: 10158290

QC Batch: MT/6046 Analysis Method: SM 2540D
QC Batch Method: SM 2540D Analysis Description: 2540D Total Suspended Solids
Associated Lab Samples: 10158290001, 10158290002, 10158290003, 10158290004, 10158290005, 10158290006, 10158290007, 10158290008, 10158290009, 10158290010, 10158290011, 10158290012, 10158290013

METHOD BLANK: 982517 Matrix: Water
Associated Lab Samples: 10158290001, 10158290002, 10158290003, 10158290004, 10158290005, 10158290006, 10158290007, 10158290008, 10158290009, 10158290010, 10158290011, 10158290012, 10158290013

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Total Suspended Solids	mg/L	<1.0	1.0	05/25/11 11:00	

LABORATORY CONTROL SAMPLE: 982518

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Total Suspended Solids	mg/L	25	28.2	113	71-129	

SAMPLE DUPLICATE: 982519

Parameter	Units	10158290004 Result	Dup Result	RPD	Max RPD	Qualifiers
Total Suspended Solids	mg/L	2670	3580	29	20	D6

SAMPLE DUPLICATE: 982520

Parameter	Units	10158114001 Result	Dup Result	RPD	Max RPD	Qualifiers
Total Suspended Solids	mg/L	268	243	10	20	

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QUALITY CONTROL DATA

Project: 776-012-002 Black Pine Mine SW
Pace Project No.: 10158290

QC Batch: MT/6064 Analysis Method: EPA 300.0
QC Batch Method: EPA 300.0 Analysis Description: 300.0 IC Anions
Associated Lab Samples: 10158290001, 10158290002, 10158290003, 10158290004, 10158290005, 10158290006, 10158290007, 10158290008, 10158290009, 10158290010, 10158290011, 10158290012, 10158290013

METHOD BLANK: 984127 Matrix: Water
Associated Lab Samples: 10158290001, 10158290002, 10158290003, 10158290004, 10158290005, 10158290006, 10158290007, 10158290008, 10158290009, 10158290010, 10158290011, 10158290012, 10158290013

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Sulfate	mg/L	<1.0	1.0	05/27/11 14:04	

LABORATORY CONTROL SAMPLE: 984128

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Sulfate	mg/L	20	19.3	97	90-110	

MATRIX SPIKE SAMPLE: 984129

Parameter	Units	10158290001 Result	Spike Conc.	MS Result	MS % Rec	% Rec Limits	Qualifiers
Sulfate	mg/L	294	500	798	101	80-120	

MATRIX SPIKE SAMPLE: 984131

Parameter	Units	10158316001 Result	Spike Conc.	MS Result	MS % Rec	% Rec Limits	Qualifiers
Sulfate	mg/L	742	1000	1730	99	80-120	

SAMPLE DUPLICATE: 984130

Parameter	Units	10158290005 Result	Dup Result	RPD	Max RPD	Qualifiers
Sulfate	mg/L	19.6	18.5	6	20	

SAMPLE DUPLICATE: 984132

Parameter	Units	10158316003 Result	Dup Result	RPD	Max RPD	Qualifiers
Sulfate	mg/L	255	224	13	20	

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QUALITY CONTROL DATA

Project: 776-012-002 Black Pine Mine SW
Pace Project No.: 10158290

QC Batch: WET/22431 Analysis Method: SM 2320B
QC Batch Method: SM 2320B Analysis Description: 2320B Alkalinity
Associated Lab Samples: 10158290001, 10158290002, 10158290003, 10158290004, 10158290005, 10158290006, 10158290007, 10158290008, 10158290009, 10158290010, 10158290011, 10158290012, 10158290013

METHOD BLANK: 983335 Matrix: Water
Associated Lab Samples: 10158290001, 10158290002, 10158290003, 10158290004, 10158290005, 10158290006, 10158290007, 10158290008, 10158290009, 10158290010, 10158290011, 10158290012, 10158290013

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Alkalinity, Total as CaCO3	mg/L	<5.0	5.0	05/26/11 11:15	

LABORATORY CONTROL SAMPLE & LCSD: 983336 983337

Parameter	Units	Spike Conc.	LCS Result	LCSD Result	LCS % Rec	LCSD % Rec	% Rec Limits	RPD	Max RPD	Qualifiers
Alkalinity, Total as CaCO3	mg/L	40	39.8	39.8	100	100	90-110	.08	30	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 983338 983339

Parameter	Units	10157782001 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Alkalinity, Total as CaCO3	mg/L	266	40	40	306	304	101	96	80-120	.7	30	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 983340 983341

Parameter	Units	10158290008 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Alkalinity, Total as CaCO3	mg/L	10.5	40	40	48.3	49.3	94	97	80-120	2	30	

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QUALITY CONTROL DATA

Project: 776-012-002 Black Pine Mine SW
Pace Project No.: 10158290

QC Batch: WET/22417 Analysis Method: SM 2540C
QC Batch Method: SM 2540C Analysis Description: 2540C Total Dissolved Solids
Associated Lab Samples: 10158290001, 10158290002, 10158290003, 10158290004, 10158290005, 10158290006, 10158290007, 10158290008, 10158290009

METHOD BLANK: 982593 Matrix: Water
Associated Lab Samples: 10158290001, 10158290002, 10158290003, 10158290004, 10158290005, 10158290006, 10158290007, 10158290008, 10158290009

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Total Dissolved Solids	mg/L	<10.0	10.0	05/25/11 14:00	

LABORATORY CONTROL SAMPLE: 982594

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Total Dissolved Solids	mg/L	1000	1000	100	80-120	

SAMPLE DUPLICATE: 982595

Parameter	Units	10158240001 Result	Dup Result	RPD	Max RPD	Qualifiers
Total Dissolved Solids	mg/L	723	732	1	20	

SAMPLE DUPLICATE: 982596

Parameter	Units	10158290001 Result	Dup Result	RPD	Max RPD	Qualifiers
Total Dissolved Solids	mg/L	584	514	13	20	

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QUALITY CONTROL DATA

Project: 776-012-002 Black Pine Mine SW
Pace Project No.: 10158290

QC Batch: WET/22430 Analysis Method: SM 2540C
QC Batch Method: SM 2540C Analysis Description: 2540C Total Dissolved Solids
Associated Lab Samples: 10158290010, 10158290011, 10158290012, 10158290013

METHOD BLANK: 983331 Matrix: Water
Associated Lab Samples: 10158290010, 10158290011, 10158290012, 10158290013

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Total Dissolved Solids	mg/L	<10.0	10.0	05/27/11 11:57	

LABORATORY CONTROL SAMPLE: 983332

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Total Dissolved Solids	mg/L	1000	992	99	80-120	

SAMPLE DUPLICATE: 983333

Parameter	Units	10158290013 Result	Dup Result	RPD	Max RPD	Qualifiers
Total Dissolved Solids	mg/L	58.0	62.0	7	20	

SAMPLE DUPLICATE: 983334

Parameter	Units	10158146003 Result	Dup Result	RPD	Max RPD	Qualifiers
Total Dissolved Solids	mg/L	150	154	3	20	

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QUALIFIERS

Project: 776-012-002 Black Pine Mine SW
Pace Project No.: 10158290

DEFINITIONS

DF - Dilution Factor, if reported, represents the factor applied to the reported data due to changes in sample preparation, dilution of the sample aliquot, or moisture content.

ND - Not Detected at or above adjusted reporting limit.

J - Estimated concentration above the adjusted method detection limit and below the adjusted reporting limit.

MDL - Adjusted Method Detection Limit.

S - Surrogate

1,2-Diphenylhydrazine (8270 listed analyte) decomposes to Azobenzene.

Consistent with EPA guidelines, unrounded data are displayed and have been used to calculate % recovery and RPD values.

LCS(D) - Laboratory Control Sample (Duplicate)

MS(D) - Matrix Spike (Duplicate)

DUP - Sample Duplicate

RPD - Relative Percent Difference

NC - Not Calculable.

SG - Silica Gel - Clean-Up

U - Indicates the compound was analyzed for, but not detected.

N-Nitrosodiphenylamine decomposes and cannot be separated from Diphenylamine using Method 8270. The result reported for each analyte is a combined concentration.

LABORATORIES

PASI-M	Pace Analytical Services - Minneapolis
PASI-MT	Pace Analytical Services - Montana

ANALYTE QUALIFIERS

D6	The relative percent difference (RPD) between the sample and sample duplicate exceeded laboratory control limits.
M1	Matrix spike recovery exceeded QC limits. Batch accepted based on laboratory control sample (LCS) recovery.
R1	RPD value was outside control limits.

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QUALITY CONTROL DATA CROSS REFERENCE TABLE

Project: 776-012-002 Black Pine Mine SW
Pace Project No.: 10158290

Lab ID	Sample ID	QC Batch Method	QC Batch	Analytical Method	Analytical Batch
10158290001	**CPS-1**	EPA 200.8	MPRP/26262	EPA 200.8	ICPM/10726
10158290002	**CPS-10A**	EPA 200.8	MPRP/26262	EPA 200.8	ICPM/10726
10158290003	**CPS-2**	EPA 200.8	MPRP/26262	EPA 200.8	ICPM/10726
10158290004	**CPS-7A**	EPA 200.8	MPRP/26262	EPA 200.8	ICPM/10726
10158290005	**CPS-8**	EPA 200.8	MPRP/26262	EPA 200.8	ICPM/10726
10158290006	**CPSW-1**	EPA 200.8	MPRP/26262	EPA 200.8	ICPM/10726
10158290007	**CPSW-2**	EPA 200.8	MPRP/26262	EPA 200.8	ICPM/10726
10158290008	**NORTH RUNOFF**	EPA 200.8	MPRP/26262	EPA 200.8	ICPM/10726
10158290009	**TSP-10**	EPA 200.8	MPRP/26262	EPA 200.8	ICPM/10726
10158290010	**BD-1**	EPA 200.8	MPRP/26262	EPA 200.8	ICPM/10726
10158290011	**CPS-10B**	EPA 200.8	MPRP/26262	EPA 200.8	ICPM/10726
10158290012	**CPS-11**	EPA 200.8	MPRP/26262	EPA 200.8	ICPM/10726
10158290013	**ROAD CUT**	EPA 200.8	MPRP/26262	EPA 200.8	ICPM/10726
10158290001	**CPS-1**	SM 2310	MT/6058		
10158290002	**CPS-10A**	SM 2310	MT/6058		
10158290003	**CPS-2**	SM 2310	MT/6058		
10158290004	**CPS-7A**	SM 2310	MT/6058		
10158290005	**CPS-8**	SM 2310	MT/6058		
10158290006	**CPSW-1**	SM 2310	MT/6058		
10158290007	**CPSW-2**	SM 2310	MT/6058		
10158290008	**NORTH RUNOFF**	SM 2310	MT/6058		
10158290009	**TSP-10**	SM 2310	MT/6058		
10158290010	**BD-1**	SM 2310	MT/6058		
10158290011	**CPS-10B**	SM 2310	MT/6058		
10158290012	**CPS-11**	SM 2310	MT/6058		
10158290013	**ROAD CUT**	SM 2310	MT/6058		
10158290001	**CPS-1**	SM 2540D	MT/6046		
10158290002	**CPS-10A**	SM 2540D	MT/6046		
10158290003	**CPS-2**	SM 2540D	MT/6046		
10158290004	**CPS-7A**	SM 2540D	MT/6046		
10158290005	**CPS-8**	SM 2540D	MT/6046		
10158290006	**CPSW-1**	SM 2540D	MT/6046		
10158290007	**CPSW-2**	SM 2540D	MT/6046		
10158290008	**NORTH RUNOFF**	SM 2540D	MT/6046		
10158290009	**TSP-10**	SM 2540D	MT/6046		
10158290010	**BD-1**	SM 2540D	MT/6046		
10158290011	**CPS-10B**	SM 2540D	MT/6046		
10158290012	**CPS-11**	SM 2540D	MT/6046		
10158290013	**ROAD CUT**	SM 2540D	MT/6046		
10158290001	**CPS-1**	EPA 300.0	MT/6064		
10158290002	**CPS-10A**	EPA 300.0	MT/6064		
10158290003	**CPS-2**	EPA 300.0	MT/6064		
10158290004	**CPS-7A**	EPA 300.0	MT/6064		
10158290005	**CPS-8**	EPA 300.0	MT/6064		
10158290006	**CPSW-1**	EPA 300.0	MT/6064		
10158290007	**CPSW-2**	EPA 300.0	MT/6064		
10158290008	**NORTH RUNOFF**	EPA 300.0	MT/6064		

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QUALITY CONTROL DATA CROSS REFERENCE TABLE

Project: 776-012-002 Black Pine Mine SW
Pace Project No.: 10158290

Lab ID	Sample ID	QC Batch Method	QC Batch	Analytical Method	Analytical Batch
10158290009	**TSP-10**	EPA 300.0	MT/6064		
10158290010	**BD-1**	EPA 300.0	MT/6064		
10158290011	**CPS-10B**	EPA 300.0	MT/6064		
10158290012	**CPS-11**	EPA 300.0	MT/6064		
10158290013	**ROAD CUT**	EPA 300.0	MT/6064		
10158290001	**CPS-1**	SM 2320B	WET/22431		
10158290002	**CPS-10A**	SM 2320B	WET/22431		
10158290003	**CPS-2**	SM 2320B	WET/22431		
10158290004	**CPS-7A**	SM 2320B	WET/22431		
10158290005	**CPS-8**	SM 2320B	WET/22431		
10158290006	**CPSW-1**	SM 2320B	WET/22431		
10158290007	**CPSW-2**	SM 2320B	WET/22431		
10158290008	**NORTH RUNOFF**	SM 2320B	WET/22431		
10158290009	**TSP-10**	SM 2320B	WET/22431		
10158290010	**BD-1**	SM 2320B	WET/22431		
10158290011	**CPS-10B**	SM 2320B	WET/22431		
10158290012	**CPS-11**	SM 2320B	WET/22431		
10158290013	**ROAD CUT**	SM 2320B	WET/22431		
10158290001	**CPS-1**	SM 2540C	WET/22417		
10158290002	**CPS-10A**	SM 2540C	WET/22417		
10158290003	**CPS-2**	SM 2540C	WET/22417		
10158290004	**CPS-7A**	SM 2540C	WET/22417		
10158290005	**CPS-8**	SM 2540C	WET/22417		
10158290006	**CPSW-1**	SM 2540C	WET/22417		
10158290007	**CPSW-2**	SM 2540C	WET/22417		
10158290008	**NORTH RUNOFF**	SM 2540C	WET/22417		
10158290009	**TSP-10**	SM 2540C	WET/22417		
10158290010	**BD-1**	SM 2540C	WET/22430		
10158290011	**CPS-10B**	SM 2540C	WET/22430		
10158290012	**CPS-11**	SM 2540C	WET/22430		
10158290013	**ROAD CUT**	SM 2540C	WET/22430		

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June 30, 2011

Kevin Houck
Herrera Environmental Consultants
101 East Broadway, Suite 610
Missoula, MT 59802

RE: Project: Black Pine Mine
Pace Project No.: 10160655

Dear Kevin Houck:
Enclosed are the analytical results for sample(s) received by the laboratory on June 17, 2011. The results relate only to the samples included in this report.

If you have any questions concerning this report, please feel free to contact me.

Sincerely,

Denise Jensen

denise.jensen@pacelabs.com
Project Manager

Enclosures

cc: Devin Clary, Montana Dept. of Environmental Quality
Mark Donner, Trihydro

REPORT OF LABORATORY ANALYSIS

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CERTIFICATIONS

Project: Black Pine Mine
Pace Project No.: 10160655

Minnesota Certification IDs

1700 Elm Street SE Suite 200, Minneapolis, MN 55414
A2LA Certification #: 2926.01
Alaska Certification #: UST-078
Alaska Certification #MN00064
Arizona Certification #: AZ-0014
Arkansas Certification #: 88-0680
California Certification #: 01155CA
EPA Region 8 Certification #: Pace
Florida/NELAP Certification #: E87605
Georgia Certification #: 959
Idaho Certification #: MN00064
Illinois Certification #: 200011
Iowa Certification #: 368
Kansas Certification #: E-10167
Louisiana Certification #: 03086
Louisiana Certification #: LA080009
Maine Certification #: 2007029
Maryland Certification #: 322
Michigan DEQ Certification #: 9909
Minnesota Certification #: 027-053-137
Mississippi Certification #: Pace
Montana Certification #: MT CERT0092
Nebraska Certification #: Pace
Nevada Certification #: MN_00064
New Jersey Certification #: MN-002
New Mexico Certification #: Pace
New York Certification #: 11647
North Carolina Certification #: 530
North Dakota Certification #: R-036
North Dakota Certification #: R-036A
Ohio VAP Certification #: CL101
Oklahoma Certification #: D9921
Oklahoma Certification #: 9507
Oregon Certification #: MN200001
Pennsylvania Certification #: 68-00563
Puerto Rico Certification
Tennessee Certification #: 02818
Texas Certification #: T104704192
Washington Certification #: C754
Wisconsin Certification #: 999407970

Montana Certification IDs

602 South 25th Street, Billings, MT 59101
EPA Region 8 Certification #: 8TMS-Q
Idaho Certification #: MT00012
Montana Certification #: MT CERT0040
NVLAP Certification #: 101292-0
Minnesota Dept of Health Certification #: 030-999-442

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SAMPLE SUMMARY

Project: Black Pine Mine
Pace Project No.: 10160655

Lab ID	Sample ID	Matrix	Date Collected	Date Received
10160655001	**CML-SW-07**	Water	06/14/11 10:05	06/17/11 08:50
10160655002	**CML-SW-03**	Water	06/15/11 08:20	06/17/11 08:50
10160655003	**CML-SW-08**	Water	06/15/11 15:20	06/17/11 08:50
10160655004	**CML-SW-10**	Water	06/15/11 14:51	06/17/11 08:50
10160655005	**CML-SW-16**	Water	06/15/11 14:09	06/17/11 08:50
10160655006	**CML-SW-15**	Water	06/15/11 13:35	06/17/11 08:50
10160655007	**CML-Q1-T1**	Water	06/15/11 13:39	06/17/11 08:50
10160655008	**CML-SW-04**	Water	06/15/11 13:20	06/17/11 08:50
10160655009	**CML-SW-13**	Water	06/15/11 12:39	06/17/11 08:50
10160655010	**CML-SW-05**	Water	06/15/11 12:35	06/17/11 08:50
10160655011	**CML-SW-11**	Water	06/15/11 14:16	06/17/11 08:50

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SAMPLE ANALYTE COUNT

Project: Black Pine Mine
Pace Project No.: 10160655

Lab ID	Sample ID	Method	Analysts	Analytes Reported	Laboratory
10160655001	**CML-SW-07**	EPA 200.8	CJS, TL1	12	PASI-M
		SM 2310	CAC	1	PASI-MT
		SM 2540D	SR1	1	PASI-MT
		EPA 300.0	JH1	1	PASI-MT
		SM 2320B	MWD	1	PASI-M
		SM 2540C	PH1	1	PASI-M
10160655002	**CML-SW-03**	EPA 200.8	CJS, TL1	12	PASI-M
		SM 2310	CAC	1	PASI-MT
		SM 2540D	SR1	1	PASI-MT
		EPA 300.0	JH1	1	PASI-MT
		SM 2320B	MWD	1	PASI-M
		SM 2540C	PH1	1	PASI-M
10160655003	**CML-SW-08**	EPA 200.8	CJS, TL1	12	PASI-M
		SM 2310	CAC	1	PASI-MT
		SM 2540D	SR1	1	PASI-MT
		EPA 300.0	JH1	1	PASI-MT
		SM 2320B	MWD	1	PASI-M
		SM 2540C	PH1	1	PASI-M
10160655004	**CML-SW-10**	EPA 200.8	CJS, TL1	12	PASI-M
		SM 2310	CAC	1	PASI-MT
		SM 2540D	SR1	1	PASI-MT
		EPA 300.0	JH1	1	PASI-MT
		SM 2320B	MWD	1	PASI-M
		SM 2540C	PH1	1	PASI-M
10160655005	**CML-SW-16**	EPA 200.8	CJS, TL1	12	PASI-M
		SM 2310	CAC	1	PASI-MT
		SM 2540D	SR1	1	PASI-MT
		EPA 300.0	JH1	1	PASI-MT
		SM 2320B	MWD	1	PASI-M
		SM 2540C	CAP	1	PASI-M
10160655006	**CML-SW-15**	EPA 200.8	CJS, TL1	12	PASI-M
		SM 2310	CAC	1	PASI-MT
		SM 2540D	SR1	1	PASI-MT
		EPA 300.0	JH1	1	PASI-MT
		SM 2320B	MWD	1	PASI-M
		SM 2540C	CAP	1	PASI-M
10160655007	**CML-Q1-T1**	EPA 200.8	CJS, TL1	12	PASI-M

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SAMPLE ANALYTE COUNT

Project: Black Pine Mine
Pace Project No.: 10160655

Lab ID	Sample ID	Method	Analysts	Analytes Reported	Laboratory
10160655008	**CML-SW-04**	EPA 200.8	CJS, TL1	12	PASI-M
		SM 2310	CAC	1	PASI-MT
		SM 2540D	SR1	1	PASI-MT
		EPA 300.0	JH1	1	PASI-MT
		SM 2320B	MWD	1	PASI-M
		SM 2540C	CAP	1	PASI-M
10160655009	**CML-SW-13**	EPA 200.8	CJS, TL1	12	PASI-M
		SM 2310	CAC	1	PASI-MT
		SM 2540D	SR1	1	PASI-MT
		EPA 300.0	JH1	1	PASI-MT
		SM 2320B	MWD	1	PASI-M
		SM 2540C	CAP	1	PASI-M
10160655010	**CML-SW-05**	EPA 200.8	CJS, TL1	12	PASI-M
		SM 2310	CAC	1	PASI-MT
		SM 2540D	SR1	1	PASI-MT
		EPA 300.0	JH1	1	PASI-MT
		SM 2320B	MWD	1	PASI-M
		SM 2540C	CAP	1	PASI-M
10160655011	**CML-SW-11**	EPA 200.8	CJS, TL1	12	PASI-M
		SM 2310	CAC	1	PASI-MT
		SM 2540D	SR1	1	PASI-MT
		EPA 300.0	JH1	1	PASI-MT
		SM 2320B	MWD	1	PASI-M
		SM 2540C	CAP	1	PASI-M

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PROJECT NARRATIVE

Project: Black Pine Mine
Pace Project No.: 10160655

Method: **EPA 200.8**
Description: 200.8 MET ICPMS
Client: Montana Dept. of Environmental Quality
Date: June 30, 2011

General Information:
11 samples were analyzed for EPA 200.8. All samples were received in acceptable condition with any exceptions noted below.

Hold Time:
The samples were analyzed within the method required hold times with any exceptions noted below.

Sample Preparation:
The samples were prepared in accordance with EPA 200.8 with any exceptions noted below.

Initial Calibrations (including MS Tune as applicable):
All criteria were within method requirements with any exceptions noted below.

Continuing Calibration:
All criteria were within method requirements with any exceptions noted below.

Internal Standards:
All internal standards were within QC limits with any exceptions noted below.

Method Blank:
All analytes were below the report limit in the method blank with any exceptions noted below.

Laboratory Control Spike:
All laboratory control spike compounds were within QC limits with any exceptions noted below.

Matrix Spikes:
All percent recoveries and relative percent differences (RPDs) were within acceptance criteria with any exceptions noted below.

QC Batch: MPRP/26726

A matrix spike and matrix spike duplicate (MS/MSD) were performed on the following sample(s): 10160655001,10160673004

M1: Matrix spike recovery exceeded QC limits. Batch accepted based on laboratory control sample (LCS) recovery.

- MS (Lab ID: 998292)
  - Iron
- MS (Lab ID: 998294)
  - Iron
- MSD (Lab ID: 998293)
  - Iron

Duplicate Sample:
All duplicate sample results were within method acceptance criteria with any exceptions noted below.

Additional Comments:

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PROJECT NARRATIVE

Project: Black Pine Mine
Pace Project No.: 10160655

Method: **SM 2310**
Description: 2310 Acidity
Client: Montana Dept. of Environmental Quality
Date: June 30, 2011

General Information:
10 samples were analyzed for SM 2310. All samples were received in acceptable condition with any exceptions noted below.

Hold Time:
The samples were analyzed within the method required hold times with any exceptions noted below.

Initial Calibrations (including MS Tune as applicable):
All criteria were within method requirements with any exceptions noted below.

Continuing Calibration:
All criteria were within method requirements with any exceptions noted below.

Internal Standards:
All internal standards were within QC limits with any exceptions noted below.

Surrogates:
All surrogates were within QC limits with any exceptions noted below.

Method Blank:
All analytes were below the report limit in the method blank with any exceptions noted below.

Laboratory Control Spike:
All laboratory control spike compounds were within QC limits with any exceptions noted below.

Matrix Spikes:
All percent recoveries and relative percent differences (RPDs) were within acceptance criteria with any exceptions noted below.

Duplicate Sample:
All duplicate sample results were within method acceptance criteria with any exceptions noted below.

Additional Comments:

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PROJECT NARRATIVE

Project: Black Pine Mine
Pace Project No.: 10160655

Method: **SM 2540D**
Description: 2540D Total Suspended Solids
Client: Montana Dept. of Environmental Quality
Date: June 30, 2011

General Information:
10 samples were analyzed for SM 2540D. All samples were received in acceptable condition with any exceptions noted below.

Hold Time:
The samples were analyzed within the method required hold times with any exceptions noted below.

Initial Calibrations (including MS Tune as applicable):
All criteria were within method requirements with any exceptions noted below.

Continuing Calibration:
All criteria were within method requirements with any exceptions noted below.

Internal Standards:
All internal standards were within QC limits with any exceptions noted below.

Surrogates:
All surrogates were within QC limits with any exceptions noted below.

Method Blank:
All analytes were below the report limit in the method blank with any exceptions noted below.

Laboratory Control Spike:
All laboratory control spike compounds were within QC limits with any exceptions noted below.

Matrix Spikes:
All percent recoveries and relative percent differences (RPDs) were within acceptance criteria with any exceptions noted below.

Duplicate Sample:
All duplicate sample results were within method acceptance criteria with any exceptions noted below.

Additional Comments:

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PROJECT NARRATIVE

Project: Black Pine Mine
Pace Project No.: 10160655

Method: **EPA 300.0**
Description: 300.0 IC Anions
Client: Montana Dept. of Environmental Quality
Date: June 30, 2011

General Information:
10 samples were analyzed for EPA 300.0. All samples were received in acceptable condition with any exceptions noted below.

Hold Time:
The samples were analyzed within the method required hold times with any exceptions noted below.

Initial Calibrations (including MS Tune as applicable):
All criteria were within method requirements with any exceptions noted below.

Continuing Calibration:
All criteria were within method requirements with any exceptions noted below.

Internal Standards:
All internal standards were within QC limits with any exceptions noted below.

Surrogates:
All surrogates were within QC limits with any exceptions noted below.

Method Blank:
All analytes were below the report limit in the method blank with any exceptions noted below.

Laboratory Control Spike:
All laboratory control spike compounds were within QC limits with any exceptions noted below.

Matrix Spikes:
All percent recoveries and relative percent differences (RPDs) were within acceptance criteria with any exceptions noted below.

Duplicate Sample:
All duplicate sample results were within method acceptance criteria with any exceptions noted below.

QC Batch: MT/6195

D6: The relative percent difference (RPD) between the sample and sample duplicate exceeded laboratory control limits.

- DUP (Lab ID: 998641)
  - Sulfate

Additional Comments:

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PROJECT NARRATIVE

Project: Black Pine Mine
Pace Project No.: 10160655

Method: **SM 2320B**
Description: 2320B Alkalinity
Client: Montana Dept. of Environmental Quality
Date: June 30, 2011

General Information:
10 samples were analyzed for SM 2320B. All samples were received in acceptable condition with any exceptions noted below.

Hold Time:
The samples were analyzed within the method required hold times with any exceptions noted below.

Method Blank:
All analytes were below the report limit in the method blank with any exceptions noted below.

Laboratory Control Spike:
All laboratory control spike compounds were within QC limits with any exceptions noted below.

Matrix Spikes:
All percent recoveries and relative percent differences (RPDs) were within acceptance criteria with any exceptions noted below.

QC Batch: WET/22674

A matrix spike and matrix spike duplicate (MS/MSD) were performed on the following sample(s): 10160707001,10160722002

M1: Matrix spike recovery exceeded QC limits. Batch accepted based on laboratory control sample (LCS) recovery.

- MS (Lab ID: 998343)
  - Alkalinity, Total as CaCO3
- MSD (Lab ID: 998344)
  - Alkalinity, Total as CaCO3

Duplicate Sample:
All duplicate sample results were within method acceptance criteria with any exceptions noted below.

Additional Comments:

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PROJECT NARRATIVE

Project: Black Pine Mine
Pace Project No.: 10160655

Method: **SM 2540C**
Description: 2540C Total Dissolved Solids
Client: Montana Dept. of Environmental Quality
Date: June 30, 2011

General Information:
10 samples were analyzed for SM 2540C. All samples were received in acceptable condition with any exceptions noted below.

Hold Time:
The samples were analyzed within the method required hold times with any exceptions noted below.

Method Blank:
All analytes were below the report limit in the method blank with any exceptions noted below.

Laboratory Control Spike:
All laboratory control spike compounds were within QC limits with any exceptions noted below.

Matrix Spikes:
All percent recoveries and relative percent differences (RPDs) were within acceptance criteria with any exceptions noted below.

Duplicate Sample:
All duplicate sample results were within method acceptance criteria with any exceptions noted below.

Additional Comments:

This data package has been reviewed for quality and completeness and is approved for release.

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ANALYTICAL RESULTS

Project: Black Pine Mine
Pace Project No.: 10160655

Sample: CML-SW-07 **Lab ID: 10160655001** Collected: 06/14/11 10:05 Received: 06/17/11 08:50 Matrix: Water

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
200.8 MET ICPMS	Analytical Method: EPA 200.8 Preparation Method: EPA 200.8							
Antimony	**42.9**	ug/L	0.50	1	06/28/11 15:18	06/30/11 05:30	7440-36-0	
Arsenic	**12.8**	ug/L	0.50	1	06/28/11 15:18	06/30/11 05:30	7440-38-2	
Barium	**81.7**	ug/L	0.30	1	06/28/11 15:18	06/30/11 05:30	7440-39-3	
Cadmium	**1.2**	ug/L	0.080	1	06/28/11 15:18	06/30/11 05:30	7440-43-9	
Chromium	**1.3**	ug/L	0.50	1	06/28/11 15:18	06/30/11 05:30	7440-47-3	
Copper	**221**	ug/L	0.50	1	06/28/11 15:18	06/30/11 05:30	7440-50-8	
Iron	**1430**	ug/L	50.0	1	06/28/11 15:18	06/30/11 05:30	7439-89-6	M1
Lead	**49.0**	ug/L	0.10	1	06/28/11 15:18	06/30/11 05:30	7439-92-1	
Manganese	**12.9**	ug/L	0.50	1	06/28/11 15:18	06/30/11 05:30	7439-96-5	
Nickel	**2.1**	ug/L	0.50	1	06/28/11 15:18	06/30/11 05:30	7440-02-0	
Silver	**0.64**	ug/L	0.50	1	06/28/11 15:18	06/30/11 13:56	7440-22-4	
Zinc	**40.5**	ug/L	5.0	1	06/28/11 15:18	06/30/11 05:30	7440-66-6	
2310 Acidity	Analytical Method: SM 2310							
Acidity	**23.4**	mg/L	5.0	1		06/24/11 16:00		
2540D Total Suspended Solids	Analytical Method: SM 2540D							
Total Suspended Solids	**1.8**	mg/L	1.0	1		06/20/11 10:40		
300.0 IC Anions	Analytical Method: EPA 300.0							
Sulfate	**8.0**	mg/L	1.0	1		06/24/11 09:10	14808-79-8	
2320B Alkalinity	Analytical Method: SM 2320B							
Alkalinity, Total as CaCO3	**12.1**	mg/L	5.0	1		06/20/11 11:46		
2540C Total Dissolved Solids	Analytical Method: SM 2540C							
Total Dissolved Solids	**94.0**	mg/L	10.0	1		06/20/11 11:21		

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ANALYTICAL RESULTS

Project: Black Pine Mine
Pace Project No.: 10160655

Sample: CML-SW-03 **Lab ID: 10160655002** Collected: 06/15/11 08:20 Received: 06/17/11 08:50 Matrix: Water

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
200.8 MET ICPMS	Analytical Method: EPA 200.8 Preparation Method: EPA 200.8							
Antimony	**1.9**	ug/L	0.50	1	06/28/11 15:18	06/30/11 05:17	7440-36-0	
Arsenic	**2.3**	ug/L	0.50	1	06/28/11 15:18	06/30/11 05:17	7440-38-2	
Barium	**59.1**	ug/L	0.30	1	06/28/11 15:18	06/30/11 05:17	7440-39-3	
Cadmium	**<0.080**	ug/L	0.080	1	06/28/11 15:18	06/30/11 05:17	7440-43-9	
Chromium	**1.2**	ug/L	0.50	1	06/28/11 15:18	06/30/11 05:17	7440-47-3	
Copper	**20.8**	ug/L	0.50	1	06/28/11 15:18	06/30/11 05:17	7440-50-8	
Iron	**1450**	ug/L	50.0	1	06/28/11 15:18	06/30/11 05:17	7439-89-6	
Lead	**2.9**	ug/L	0.10	1	06/28/11 15:18	06/30/11 05:17	7439-92-1	
Manganese	**8.8**	ug/L	0.50	1	06/28/11 15:18	06/30/11 05:17	7439-96-5	
Nickel	**1.7**	ug/L	0.50	1	06/28/11 15:18	06/30/11 05:17	7440-02-0	
Silver	**<0.50**	ug/L	0.50	1	06/28/11 15:18	06/30/11 13:59	7440-22-4	
Zinc	**10.5**	ug/L	5.0	1	06/28/11 15:18	06/30/11 05:17	7440-66-6	
2310 Acidity	Analytical Method: SM 2310							
Acidity	**13.9**	mg/L	5.0	1		06/24/11 16:00		
2540D Total Suspended Solids	Analytical Method: SM 2540D							
Total Suspended Solids	**2.0**	mg/L	1.0	1		06/20/11 10:40		
300.0 IC Anions	Analytical Method: EPA 300.0							
Sulfate	**6.7**	mg/L	1.0	1		06/24/11 02:03	14808-79-8	
2320B Alkalinity	Analytical Method: SM 2320B							
Alkalinity, Total as CaCO3	**11.7**	mg/L	5.0	1		06/20/11 12:27		
2540C Total Dissolved Solids	Analytical Method: SM 2540C							
Total Dissolved Solids	**103**	mg/L	10.0	1		06/20/11 11:28		

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ANALYTICAL RESULTS

Project: Black Pine Mine
Pace Project No.: 10160655

Sample: CML-SW-08 **Lab ID: 10160655003** Collected: 06/15/11 15:20 Received: 06/17/11 08:50 Matrix: Water

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
200.8 MET ICPMS	Analytical Method: EPA 200.8 Preparation Method: EPA 200.8							
Antimony	**3.4**	ug/L	0.50	1	06/28/11 15:18	06/30/11 05:21	7440-36-0	
Arsenic	**1.7**	ug/L	0.50	1	06/28/11 15:18	06/30/11 05:21	7440-38-2	
Barium	**37.7**	ug/L	0.30	1	06/28/11 15:18	06/30/11 05:21	7440-39-3	
Cadmium	**0.12**	ug/L	0.080	1	06/28/11 15:18	06/30/11 05:21	7440-43-9	
Chromium	**0.68**	ug/L	0.50	1	06/28/11 15:18	06/30/11 05:21	7440-47-3	
Copper	**16.7**	ug/L	0.50	1	06/28/11 15:18	06/30/11 05:21	7440-50-8	
Iron	**381**	ug/L	50.0	1	06/28/11 15:18	06/30/11 05:21	7439-89-6	
Lead	**3.7**	ug/L	0.10	1	06/28/11 15:18	06/30/11 05:21	7439-92-1	
Manganese	**5.8**	ug/L	0.50	1	06/28/11 15:18	06/30/11 05:21	7439-96-5	
Nickel	**0.72**	ug/L	0.50	1	06/28/11 15:18	06/30/11 05:21	7440-02-0	
Silver	**<0.50**	ug/L	0.50	1	06/28/11 15:18	06/30/11 14:03	7440-22-4	
Zinc	**12.5**	ug/L	5.0	1	06/28/11 15:18	06/30/11 05:21	7440-66-6	
2310 Acidity	Analytical Method: SM 2310							
Acidity	**16.7**	mg/L	5.0	1		06/24/11 16:00		
2540D Total Suspended Solids	Analytical Method: SM 2540D							
Total Suspended Solids	**2.1**	mg/L	1.0	1		06/20/11 10:40		
300.0 IC Anions	Analytical Method: EPA 300.0							
Sulfate	**3.4**	mg/L	1.0	1		06/24/11 02:31	14808-79-8	
2320B Alkalinity	Analytical Method: SM 2320B							
Alkalinity, Total as CaCO3	**7.4**	mg/L	5.0	1		06/20/11 12:30		
2540C Total Dissolved Solids	Analytical Method: SM 2540C							
Total Dissolved Solids	**50.0**	mg/L	10.0	1		06/20/11 11:31		

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ANALYTICAL RESULTS

Project: Black Pine Mine
Pace Project No.: 10160655

Sample: CML-SW-10 **Lab ID: 10160655004** Collected: 06/15/11 14:51 Received: 06/17/11 08:50 Matrix: Water

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
200.8 MET ICPMS	Analytical Method: EPA 200.8 Preparation Method: EPA 200.8							
Antimony	**2.4**	ug/L	0.50	1	06/28/11 15:18	06/30/11 05:26	7440-36-0	
Arsenic	**1.2**	ug/L	0.50	1	06/28/11 15:18	06/30/11 05:26	7440-38-2	
Barium	**37.0**	ug/L	0.30	1	06/28/11 15:18	06/30/11 05:26	7440-39-3	
Cadmium	**0.12**	ug/L	0.080	1	06/28/11 15:18	06/30/11 05:26	7440-43-9	
Chromium	**0.90**	ug/L	0.50	1	06/28/11 15:18	06/30/11 05:26	7440-47-3	
Copper	**13.8**	ug/L	0.50	1	06/28/11 15:18	06/30/11 05:26	7440-50-8	
Iron	**338**	ug/L	50.0	1	06/28/11 15:18	06/30/11 05:26	7439-89-6	
Lead	**2.7**	ug/L	0.10	1	06/28/11 15:18	06/30/11 05:26	7439-92-1	
Manganese	**5.2**	ug/L	0.50	1	06/28/11 15:18	06/30/11 05:26	7439-96-5	
Nickel	**1.6**	ug/L	0.50	1	06/28/11 15:18	06/30/11 05:26	7440-02-0	
Silver	**<0.50**	ug/L	0.50	1	06/28/11 15:18	06/30/11 14:07	7440-22-4	
Zinc	**9.4**	ug/L	5.0	1	06/28/11 15:18	06/30/11 05:26	7440-66-6	
2310 Acidity	Analytical Method: SM 2310							
Acidity	**21.5**	mg/L	5.0	1		06/24/11 16:00		
2540D Total Suspended Solids	Analytical Method: SM 2540D							
Total Suspended Solids	**2.0**	mg/L	1.0	1		06/20/11 10:40		
300.0 IC Anions	Analytical Method: EPA 300.0							
Sulfate	**3.3**	mg/L	1.0	1		06/24/11 03:00	14808-79-8	
2320B Alkalinity	Analytical Method: SM 2320B							
Alkalinity, Total as CaCO3	**7.3**	mg/L	5.0	1		06/20/11 12:33		
2540C Total Dissolved Solids	Analytical Method: SM 2540C							
Total Dissolved Solids	**63.0**	mg/L	10.0	1		06/20/11 11:31		

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ANALYTICAL RESULTS

Project: Black Pine Mine
Pace Project No.: 10160655

Sample: CML-SW-16 **Lab ID: 10160655005** Collected: 06/15/11 14:09 Received: 06/17/11 08:50 Matrix: Water

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
200.8 MET ICPMS	Analytical Method: EPA 200.8 Preparation Method: EPA 200.8							
Antimony	**1.6**	ug/L	0.50	1	06/28/11 15:18	06/30/11 06:06	7440-36-0	
Arsenic	**1.2**	ug/L	0.50	1	06/28/11 15:18	06/30/11 06:06	7440-38-2	
Barium	**42.8**	ug/L	0.30	1	06/28/11 15:18	06/30/11 06:06	7440-39-3	
Cadmium	**0.11**	ug/L	0.080	1	06/28/11 15:18	06/30/11 06:06	7440-43-9	
Chromium	**0.78**	ug/L	0.50	1	06/28/11 15:18	06/30/11 06:06	7440-47-3	
Copper	**11.8**	ug/L	0.50	1	06/28/11 15:18	06/30/11 06:06	7440-50-8	
Iron	**356**	ug/L	50.0	1	06/28/11 15:18	06/30/11 06:06	7439-89-6	
Lead	**5.1**	ug/L	0.10	1	06/28/11 15:18	06/30/11 06:06	7439-92-1	
Manganese	**5.5**	ug/L	0.50	1	06/28/11 15:18	06/30/11 06:06	7439-96-5	
Nickel	**0.72**	ug/L	0.50	1	06/28/11 15:18	06/30/11 06:06	7440-02-0	
Silver	**<0.50**	ug/L	0.50	1	06/28/11 15:18	06/30/11 14:10	7440-22-4	
Zinc	**6.1**	ug/L	5.0	1	06/28/11 15:18	06/30/11 06:06	7440-66-6	
2310 Acidity	Analytical Method: SM 2310							
Acidity	**8.2**	mg/L	5.0	1		06/24/11 16:00		
2540D Total Suspended Solids	Analytical Method: SM 2540D							
Total Suspended Solids	**<2.0**	mg/L	2.0	1		06/20/11 10:40		
300.0 IC Anions	Analytical Method: EPA 300.0							
Sulfate	**2.8**	mg/L	1.0	1		06/24/11 03:28	14808-79-8	
2320B Alkalinity	Analytical Method: SM 2320B							
Alkalinity, Total as CaCO3	**8.0**	mg/L	5.0	1		06/20/11 12:37		
2540C Total Dissolved Solids	Analytical Method: SM 2540C							
Total Dissolved Solids	**34.0**	mg/L	10.0	1		06/22/11 11:27		

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ANALYTICAL RESULTS

Project: Black Pine Mine
Pace Project No.: 10160655

Sample: CML-SW-15 **Lab ID: 10160655006** Collected: 06/15/11 13:35 Received: 06/17/11 08:50 Matrix: Water

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
200.8 MET ICPMS	Analytical Method: EPA 200.8 Preparation Method: EPA 200.8							
Antimony	**<0.50**	ug/L	0.50	1	06/28/11 15:18	06/30/11 06:10	7440-36-0	
Arsenic	**0.68**	ug/L	0.50	1	06/28/11 15:18	06/30/11 06:10	7440-38-2	
Barium	**42.5**	ug/L	0.30	1	06/28/11 15:18	06/30/11 06:10	7440-39-3	
Cadmium	**<0.080**	ug/L	0.080	1	06/28/11 15:18	06/30/11 06:10	7440-43-9	
Chromium	**0.64**	ug/L	0.50	1	06/28/11 15:18	06/30/11 06:10	7440-47-3	
Copper	**5.8**	ug/L	0.50	1	06/28/11 15:18	06/30/11 06:10	7440-50-8	
Iron	**321**	ug/L	50.0	1	06/28/11 15:18	06/30/11 06:10	7439-89-6	
Lead	**0.61**	ug/L	0.10	1	06/28/11 15:18	06/30/11 06:10	7439-92-1	
Manganese	**5.6**	ug/L	0.50	1	06/28/11 15:18	06/30/11 06:10	7439-96-5	
Nickel	**0.62**	ug/L	0.50	1	06/28/11 15:18	06/30/11 06:10	7440-02-0	
Silver	**<0.50**	ug/L	0.50	1	06/28/11 15:18	06/30/11 14:14	7440-22-4	
Zinc	**<5.0**	ug/L	5.0	1	06/28/11 15:18	06/30/11 06:10	7440-66-6	
2310 Acidity	Analytical Method: SM 2310							
Acidity	**12.0**	mg/L	5.0	1		06/24/11 16:00		
2540D Total Suspended Solids	Analytical Method: SM 2540D							
Total Suspended Solids	**2.1**	mg/L	1.0	1		06/20/11 10:40		
300.0 IC Anions	Analytical Method: EPA 300.0							
Sulfate	**3.0**	mg/L	1.0	1		06/24/11 03:57	14808-79-8	
2320B Alkalinity	Analytical Method: SM 2320B							
Alkalinity, Total as CaCO3	**8.3**	mg/L	5.0	1		06/20/11 12:40		
2540C Total Dissolved Solids	Analytical Method: SM 2540C							
Total Dissolved Solids	**34.0**	mg/L	10.0	1		06/22/11 11:27		

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ANALYTICAL RESULTS

Project: Black Pine Mine
Pace Project No.: 10160655

Sample: CML-Q1-T1 **Lab ID: 10160655007** Collected: 06/15/11 13:39 Received: 06/17/11 08:50 Matrix: Water

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
200.8 MET ICPMS	Analytical Method: EPA 200.8 Preparation Method: EPA 200.8							
Antimony	**<0.50**	ug/L	0.50	1	06/28/11 15:18	06/30/11 06:15	7440-36-0	
Arsenic	**0.65**	ug/L	0.50	1	06/28/11 15:18	06/30/11 06:15	7440-38-2	
Barium	**43.4**	ug/L	0.30	1	06/28/11 15:18	06/30/11 06:15	7440-39-3	
Cadmium	**<0.080**	ug/L	0.080	1	06/28/11 15:18	06/30/11 06:15	7440-43-9	
Chromium	**0.79**	ug/L	0.50	1	06/28/11 15:18	06/30/11 06:15	7440-47-3	
Copper	**6.0**	ug/L	0.50	1	06/28/11 15:18	06/30/11 06:15	7440-50-8	
Iron	**340**	ug/L	50.0	1	06/28/11 15:18	06/30/11 06:15	7439-89-6	
Lead	**0.63**	ug/L	0.10	1	06/28/11 15:18	06/30/11 06:15	7439-92-1	
Manganese	**5.8**	ug/L	0.50	1	06/28/11 15:18	06/30/11 06:15	7439-96-5	
Nickel	**0.75**	ug/L	0.50	1	06/28/11 15:18	06/30/11 06:15	7440-02-0	
Silver	**<0.50**	ug/L	0.50	1	06/28/11 15:18	06/30/11 14:38	7440-22-4	
Zinc	**5.2**	ug/L	5.0	1	06/28/11 15:18	06/30/11 06:15	7440-66-6	

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ANALYTICAL RESULTS

Project: Black Pine Mine
Pace Project No.: 10160655

Sample: CML-SW-04 **Lab ID: 10160655008** Collected: 06/15/11 13:20 Received: 06/17/11 08:50 Matrix: Water

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
200.8 MET ICPMS	Analytical Method: EPA 200.8 Preparation Method: EPA 200.8							
Antimony	**<0.50**	ug/L	0.50	1	06/28/11 15:18	06/30/11 06:19	7440-36-0	
Arsenic	**0.53**	ug/L	0.50	1	06/28/11 15:18	06/30/11 06:19	7440-38-2	
Barium	**41.1**	ug/L	0.30	1	06/28/11 15:18	06/30/11 06:19	7440-39-3	
Cadmium	**<0.080**	ug/L	0.080	1	06/28/11 15:18	06/30/11 06:19	7440-43-9	
Chromium	**0.62**	ug/L	0.50	1	06/28/11 15:18	06/30/11 06:19	7440-47-3	
Copper	**3.8**	ug/L	0.50	1	06/28/11 15:18	06/30/11 06:19	7440-50-8	
Iron	**288**	ug/L	50.0	1	06/28/11 15:18	06/30/11 06:19	7439-89-6	
Lead	**0.31**	ug/L	0.10	1	06/28/11 15:18	06/30/11 06:19	7439-92-1	
Manganese	**4.7**	ug/L	0.50	1	06/28/11 15:18	06/30/11 06:19	7439-96-5	
Nickel	**0.54**	ug/L	0.50	1	06/28/11 15:18	06/30/11 06:19	7440-02-0	
Silver	**<0.50**	ug/L	0.50	1	06/28/11 15:18	06/30/11 14:41	7440-22-4	
Zinc	**<5.0**	ug/L	5.0	1	06/28/11 15:18	06/30/11 06:19	7440-66-6	
2310 Acidity	Analytical Method: SM 2310							
Acidity	**10.1**	mg/L	5.0	1		06/24/11 16:00		
2540D Total Suspended Solids	Analytical Method: SM 2540D							
Total Suspended Solids	**1.5**	mg/L	1.0	1		06/20/11 10:40		
300.0 IC Anions	Analytical Method: EPA 300.0							
Sulfate	**2.6**	mg/L	1.0	1		06/24/11 04:25	14808-79-8	
2320B Alkalinity	Analytical Method: SM 2320B							
Alkalinity, Total as CaCO3	**7.8**	mg/L	5.0	1		06/20/11 12:52		
2540C Total Dissolved Solids	Analytical Method: SM 2540C							
Total Dissolved Solids	**29.0**	mg/L	10.0	1		06/22/11 11:28		

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ANALYTICAL RESULTS

Project: Black Pine Mine
Pace Project No.: 10160655

Sample: CML-SW-13 **Lab ID: 10160655009** Collected: 06/15/11 12:39 Received: 06/17/11 08:50 Matrix: Water

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
200.8 MET ICPMS	Analytical Method: EPA 200.8 Preparation Method: EPA 200.8							
Antimony	**<0.50**	ug/L	0.50	1	06/28/11 15:18	06/30/11 06:23	7440-36-0	
Arsenic	**<0.50**	ug/L	0.50	1	06/28/11 15:18	06/30/11 06:23	7440-38-2	
Barium	**40.3**	ug/L	0.30	1	06/28/11 15:18	06/30/11 06:23	7440-39-3	
Cadmium	**<0.080**	ug/L	0.080	1	06/28/11 15:18	06/30/11 06:23	7440-43-9	
Chromium	**0.54**	ug/L	0.50	1	06/28/11 15:18	06/30/11 06:23	7440-47-3	
Copper	**2.1**	ug/L	0.50	1	06/28/11 15:18	06/30/11 06:23	7440-50-8	
Iron	**168**	ug/L	50.0	1	06/28/11 15:18	06/30/11 06:23	7439-89-6	
Lead	**0.18**	ug/L	0.10	1	06/28/11 15:18	06/30/11 06:23	7439-92-1	
Manganese	**3.4**	ug/L	0.50	1	06/28/11 15:18	06/30/11 06:23	7439-96-5	
Nickel	**0.77**	ug/L	0.50	1	06/28/11 15:18	06/30/11 06:23	7440-02-0	
Silver	**<0.50**	ug/L	0.50	1	06/28/11 15:18	06/30/11 14:45	7440-22-4	
Zinc	**6.8**	ug/L	5.0	1	06/28/11 15:18	06/30/11 06:23	7440-66-6	
2310 Acidity	Analytical Method: SM 2310							
Acidity	**<5.0**	mg/L	5.0	1		06/24/11 16:00		
2540D Total Suspended Solids	Analytical Method: SM 2540D							
Total Suspended Solids	**1.1**	mg/L	1.0	1		06/20/11 10:40		
300.0 IC Anions	Analytical Method: EPA 300.0							
Sulfate	**2.0**	mg/L	1.0	1		06/24/11 04:54	14808-79-8	
2320B Alkalinity	Analytical Method: SM 2320B							
Alkalinity, Total as CaCO3	**7.6**	mg/L	5.0	1		06/20/11 12:55		
2540C Total Dissolved Solids	Analytical Method: SM 2540C							
Total Dissolved Solids	**26.0**	mg/L	10.0	1		06/22/11 11:29		

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ANALYTICAL RESULTS

Project: Black Pine Mine
Pace Project No.: 10160655

Sample: CML-SW-05 **Lab ID: 10160655010** Collected: 06/15/11 12:35 Received: 06/17/11 08:50 Matrix: Water

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
200.8 MET ICPMS	Analytical Method: EPA 200.8 Preparation Method: EPA 200.8							
Antimony	**<0.50**	ug/L	0.50	1	06/28/11 15:18	06/30/11 06:28	7440-36-0	
Arsenic	**<0.50**	ug/L	0.50	1	06/28/11 15:18	06/30/11 06:28	7440-38-2	
Barium	**39.6**	ug/L	0.30	1	06/28/11 15:18	06/30/11 06:28	7440-39-3	
Cadmium	**<0.080**	ug/L	0.080	1	06/28/11 15:18	06/30/11 06:28	7440-43-9	
Chromium	**<0.50**	ug/L	0.50	1	06/28/11 15:18	06/30/11 06:28	7440-47-3	
Copper	**1.0**	ug/L	0.50	1	06/28/11 15:18	06/30/11 06:28	7440-50-8	
Iron	**162**	ug/L	50.0	1	06/28/11 15:18	06/30/11 06:28	7439-89-6	
Lead	**0.12**	ug/L	0.10	1	06/28/11 15:18	06/30/11 06:28	7439-92-1	
Manganese	**2.5**	ug/L	0.50	1	06/28/11 15:18	06/30/11 06:28	7439-96-5	
Nickel	**<0.50**	ug/L	0.50	1	06/28/11 15:18	06/30/11 06:28	7440-02-0	
Silver	**<0.50**	ug/L	0.50	1	06/28/11 15:18	06/30/11 14:48	7440-22-4	
Zinc	**<5.0**	ug/L	5.0	1	06/28/11 15:18	06/30/11 06:28	7440-66-6	
2310 Acidity	Analytical Method: SM 2310							
Acidity	**20.5**	mg/L	5.0	1		06/24/11 16:00		
2540D Total Suspended Solids	Analytical Method: SM 2540D							
Total Suspended Solids	**1.4**	mg/L	1.1	1		06/20/11 10:40		
300.0 IC Anions	Analytical Method: EPA 300.0							
Sulfate	**2.0**	mg/L	1.0	1		06/24/11 05:22	14808-79-8	
2320B Alkalinity	Analytical Method: SM 2320B							
Alkalinity, Total as CaCO3	**7.2**	mg/L	5.0	1		06/20/11 12:58		
2540C Total Dissolved Solids	Analytical Method: SM 2540C							
Total Dissolved Solids	**24.0**	mg/L	10.0	1		06/22/11 11:29		

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ANALYTICAL RESULTS

Project: Black Pine Mine
Pace Project No.: 10160655

Sample: CML-SW-11 **Lab ID: 10160655011** Collected: 06/15/11 14:16 Received: 06/17/11 08:50 Matrix: Water

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
200.8 MET ICPMS	Analytical Method: EPA 200.8 Preparation Method: EPA 200.8							
Antimony	**1.7**	ug/L	0.50	1	06/28/11 15:18	06/30/11 06:32	7440-36-0	
Arsenic	**0.90**	ug/L	0.50	1	06/28/11 15:18	06/30/11 06:32	7440-38-2	
Barium	**42.0**	ug/L	0.30	1	06/28/11 15:18	06/30/11 06:32	7440-39-3	
Cadmium	**0.090**	ug/L	0.080	1	06/28/11 15:18	06/30/11 06:32	7440-43-9	
Chromium	**0.75**	ug/L	0.50	1	06/28/11 15:18	06/30/11 06:32	7440-47-3	
Copper	**11.6**	ug/L	0.50	1	06/28/11 15:18	06/30/11 06:32	7440-50-8	
Iron	**400**	ug/L	50.0	1	06/28/11 15:18	06/30/11 06:32	7439-89-6	
Lead	**1.7**	ug/L	0.10	1	06/28/11 15:18	06/30/11 06:32	7439-92-1	
Manganese	**5.8**	ug/L	0.50	1	06/28/11 15:18	06/30/11 06:32	7439-96-5	
Nickel	**0.77**	ug/L	0.50	1	06/28/11 15:18	06/30/11 06:32	7440-02-0	
Silver	**<0.50**	ug/L	0.50	1	06/28/11 15:18	06/30/11 14:51	7440-22-4	
Zinc	**7.2**	ug/L	5.0	1	06/28/11 15:18	06/30/11 06:32	7440-66-6	
2310 Acidity	Analytical Method: SM 2310							
Acidity	**7.3**	mg/L	5.0	1		06/24/11 16:00		
2540D Total Suspended Solids	Analytical Method: SM 2540D							
Total Suspended Solids	**1.8**	mg/L	1.0	1		06/20/11 10:40		
300.0 IC Anions	Analytical Method: EPA 300.0							
Sulfate	**2.9**	mg/L	1.0	1		06/24/11 05:51	14808-79-8	
2320B Alkalinity	Analytical Method: SM 2320B							
Alkalinity, Total as CaCO3	**9.2**	mg/L	5.0	1		06/20/11 13:02		
2540C Total Dissolved Solids	Analytical Method: SM 2540C							
Total Dissolved Solids	**36.0**	mg/L	10.0	1		06/22/11 11:30		

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QUALITY CONTROL DATA

Project: Black Pine Mine
Pace Project No.: 10160655

QC Batch: MPRP/26726 Analysis Method: EPA 200.8
QC Batch Method: EPA 200.8 Analysis Description: 200.8 MET
Associated Lab Samples: 10160655001, 10160655002, 10160655003, 10160655004, 10160655005, 10160655006, 10160655007, 10160655008, 10160655009, 10160655010, 10160655011

METHOD BLANK: 998290 Matrix: Water
Associated Lab Samples: 10160655001, 10160655002, 10160655003, 10160655004, 10160655005, 10160655006, 10160655007, 10160655008, 10160655009, 10160655010, 10160655011

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Antimony	ug/L	<0.50	0.50	06/30/11 06:01	
Arsenic	ug/L	<0.50	0.50	06/30/11 06:01	
Barium	ug/L	<0.30	0.30	06/30/11 06:01	
Cadmium	ug/L	<0.080	0.080	06/30/11 06:01	
Chromium	ug/L	<0.50	0.50	06/30/11 06:01	
Copper	ug/L	<0.50	0.50	06/30/11 06:01	
Iron	ug/L	<50.0	50.0	06/30/11 06:01	
Lead	ug/L	<0.10	0.10	06/30/11 06:01	
Manganese	ug/L	<0.50	0.50	06/30/11 06:01	
Nickel	ug/L	<0.50	0.50	06/30/11 06:01	
Silver	ug/L	<0.50	0.50	06/30/11 06:01	
Zinc	ug/L	<5.0	5.0	06/30/11 06:01	

LABORATORY CONTROL SAMPLE: 998291

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Antimony	ug/L	80	79.8	100	85-115	
Arsenic	ug/L	80	82.4	103	85-115	
Barium	ug/L	80	81.9	102	85-115	
Cadmium	ug/L	80	81.5	102	85-115	
Chromium	ug/L	80	81.8	102	85-115	
Copper	ug/L	80	85.5	107	85-115	
Iron	ug/L	1000	1020	102	85-115	
Lead	ug/L	80	81.7	102	85-115	
Manganese	ug/L	80	82.0	102	85-115	
Nickel	ug/L	80	79.6	99	85-115	
Silver	ug/L	80	86.3	108	85-115	
Zinc	ug/L	80	77.7	97	85-115	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 998292 998293

Parameter	Units	10160655001 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Antimony	ug/L	42.9	80	80	125	128	103	106	70-130	2	20	
Arsenic	ug/L	12.8	80	80	95.3	95.4	103	103	70-130	.1	20	
Barium	ug/L	81.7	80	80	170	170	111	110	70-130	.5	20	
Cadmium	ug/L	1.2	80	80	84.3	82.5	104	102	70-130	2	20	
Chromium	ug/L	1.3	80	80	85.1	84.1	105	104	70-130	1	20	

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QUALITY CONTROL DATA

Project: Black Pine Mine
Pace Project No.: 10160655

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 998292 998293

Parameter	Units	10160655001 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Copper	ug/L	221	80	80	314	311	116	114	70-130	.7	20	
Iron	ug/L	1430	1000	1000	2810	2900	138	147	70-130	3	20	M1
Lead	ug/L	49.0	80	80	133	134	104	106	70-130	.8	20	
Manganese	ug/L	12.9	80	80	96.2	96.9	104	105	70-130	.7	20	
Nickel	ug/L	2.1	80	80	81.6	81.0	99	99	70-130	.8	20	
Silver	ug/L	0.64	80	80	80.9	84.1	100	104	70-130	4	20	
Zinc	ug/L	40.5	80	80	122	120	101	99	70-130	2	20	

MATRIX SPIKE SAMPLE: 998294

Parameter	Units	10160673004 Result	Spike Conc.	MS Result	MS % Rec	% Rec Limits	Qualifiers
Antimony	ug/L	0.53	80	78.9	98	70-130	
Arsenic	ug/L	1.1	80	82.3	101	70-130	
Barium	ug/L	85.4	80	169	104	70-130	
Cadmium	ug/L	<0.080	80	80.3	100	70-130	
Chromium	ug/L	1.3	80	83.0	102	70-130	
Copper	ug/L	22.5	80	106	104	70-130	
Iron	ug/L	1000	1000	2310	131	70-130	M1
Lead	ug/L	0.97	80	81.2	100	70-130	
Manganese	ug/L	8.9	80	89.0	100	70-130	
Nickel	ug/L	2.2	80	79.7	97	70-130	
Silver	ug/L	<0.50	80	78.7	98	70-130	
Zinc	ug/L	8.2	80	85.9	97	70-130	

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QUALITY CONTROL DATA

Project: Black Pine Mine
Pace Project No.: 10160655

QC Batch: MT/6228 Analysis Method: SM 2310
QC Batch Method: SM 2310 Analysis Description: 2310 Acidity
Associated Lab Samples: 10160655001, 10160655002, 10160655003, 10160655004, 10160655005, 10160655006, 10160655008, 10160655009, 10160655010, 10160655011

METHOD BLANK: 1000993 Matrix: Water
Associated Lab Samples: 10160655001, 10160655002, 10160655003, 10160655004, 10160655005, 10160655006, 10160655008, 10160655009, 10160655010, 10160655011

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Acidity	mg/L	<5.0	5.0	06/24/11 16:00	

SAMPLE DUPLICATE: 1000995

Parameter	Units	10160655003 Result	Dup Result	RPD	Max RPD	Qualifiers
Acidity	mg/L	16.7	16.7	0	20	

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QUALITY CONTROL DATA

Project: Black Pine Mine
Pace Project No.: 10160655

QC Batch: MT/6192 Analysis Method: SM 2540D
QC Batch Method: SM 2540D Analysis Description: 2540D Total Suspended Solids
Associated Lab Samples: 10160655001, 10160655002, 10160655003, 10160655004, 10160655005, 10160655006, 10160655008, 10160655009, 10160655010, 10160655011

METHOD BLANK: 998564 Matrix: Water
Associated Lab Samples: 10160655001, 10160655002, 10160655003, 10160655004, 10160655005, 10160655006, 10160655008, 10160655009, 10160655010, 10160655011

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Total Suspended Solids	mg/L	<1.0	1.0	06/20/11 10:40	

LABORATORY CONTROL SAMPLE: 998563

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Total Suspended Solids	mg/L	25	25.0	100	71-129	

SAMPLE DUPLICATE: 998919

Parameter	Units	10160673006 Result	Dup Result	RPD	Max RPD	Qualifiers
Total Suspended Solids	mg/L	<2.0	<2.0		20	

SAMPLE DUPLICATE: 998920

Parameter	Units	10160655005 Result	Dup Result	RPD	Max RPD	Qualifiers
Total Suspended Solids	mg/L	<2.0	2.2		20	

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QUALITY CONTROL DATA

Project: Black Pine Mine
Pace Project No.: 10160655

QC Batch: MT/6195 Analysis Method: EPA 300.0
QC Batch Method: EPA 300.0 Analysis Description: 300.0 IC Anions
Associated Lab Samples: 10160655001, 10160655002, 10160655003, 10160655004, 10160655005, 10160655006, 10160655008, 10160655009, 10160655010, 10160655011

METHOD BLANK: 998638 Matrix: Water
Associated Lab Samples: 10160655001, 10160655002, 10160655003, 10160655004, 10160655005, 10160655006, 10160655008, 10160655009, 10160655010, 10160655011

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Sulfate	mg/L	<1.0	1.0	06/23/11 22:15	

LABORATORY CONTROL SAMPLE: 998639

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Sulfate	mg/L	20	19.5	98	90-110	

MATRIX SPIKE SAMPLE: 998640

Parameter	Units	10160067001 Result	Spike Conc.	MS Result	MS % Rec	% Rec Limits	Qualifiers
Sulfate	mg/L	12.5	20	32.2	99	80-120	

MATRIX SPIKE SAMPLE: 998642

Parameter	Units	10160709001 Result	Spike Conc.	MS Result	MS % Rec	% Rec Limits	Qualifiers
Sulfate	mg/L	4110	4000	8170	101	80-120	

SAMPLE DUPLICATE: 998641

Parameter	Units	10160067002 Result	Dup Result	RPD	Max RPD	Qualifiers
Sulfate	mg/L	14.1	18.4	26	20	D6

SAMPLE DUPLICATE: 998643

Parameter	Units	10160709002 Result	Dup Result	RPD	Max RPD	Qualifiers
Sulfate	mg/L	5330	5370	.6	20	

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QUALITY CONTROL DATA

Project: Black Pine Mine
Pace Project No.: 10160655

QC Batch: WET/22674 Analysis Method: SM 2320B
QC Batch Method: SM 2320B Analysis Description: 2320B Alkalinity
Associated Lab Samples: 10160655001, 10160655002, 10160655003, 10160655004, 10160655005, 10160655006, 10160655008, 10160655009, 10160655010, 10160655011

METHOD BLANK: 998338 Matrix: Water
Associated Lab Samples: 10160655001, 10160655002, 10160655003, 10160655004, 10160655005, 10160655006, 10160655008, 10160655009, 10160655010, 10160655011

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Alkalinity, Total as CaCO3	mg/L	<5.0	5.0	06/20/11 11:16	

LABORATORY CONTROL SAMPLE & LCSD: 998339 998340

Parameter	Units	Spike Conc.	LCS Result	LCSD Result	LCS % Rec	LCSD % Rec	% Rec Limits	RPD	Max RPD	Qualifiers
Alkalinity, Total as CaCO3	mg/L	40	39.0	39.7	98	99	90-110	2	30	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 998341 998342

Parameter	Units	10160707001 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Alkalinity, Total as CaCO3	mg/L	13.4	40	40	53.2	53.8	99	101	80-120	1	30	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 998343 998344

Parameter	Units	10160722002 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Alkalinity, Total as CaCO3	mg/L	232	40	40	281	283	124	127	80-120	.4	30	M1

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QUALITY CONTROL DATA

Project: Black Pine Mine
Pace Project No.: 10160655

QC Batch: WET/22678 Analysis Method: SM 2540C
QC Batch Method: SM 2540C Analysis Description: 2540C Total Dissolved Solids
Associated Lab Samples: 10160655001, 10160655002, 10160655003, 10160655004

METHOD BLANK: 998440 Matrix: Water
Associated Lab Samples: 10160655001, 10160655002, 10160655003, 10160655004

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Total Dissolved Solids	mg/L	<10.0	10.0	06/20/11 12:01	

LABORATORY CONTROL SAMPLE: 998441

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Total Dissolved Solids	mg/L	1000	982	98	80-120	

SAMPLE DUPLICATE: 998442

Parameter	Units	10160707001 Result	Dup Result	RPD	Max RPD	Qualifiers
Total Dissolved Solids	mg/L	125	115	8	20	

SAMPLE DUPLICATE: 998443

Parameter	Units	10160655002 Result	Dup Result	RPD	Max RPD	Qualifiers
Total Dissolved Solids	mg/L	103	94.0	9	20	

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QUALITY CONTROL DATA

Project: Black Pine Mine
Pace Project No.: 10160655

QC Batch: WET/22692 Analysis Method: SM 2540C
QC Batch Method: SM 2540C Analysis Description: 2540C Total Dissolved Solids
Associated Lab Samples: 10160655005, 10160655006, 10160655008, 10160655009, 10160655010, 10160655011

METHOD BLANK: 999964 Matrix: Water
Associated Lab Samples: 10160655005, 10160655006, 10160655008, 10160655009, 10160655010, 10160655011

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Total Dissolved Solids	mg/L	<10.0	10.0	06/22/11 11:26	

LABORATORY CONTROL SAMPLE: 999965

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Total Dissolved Solids	mg/L	1000	998	100	80-120	

SAMPLE DUPLICATE: 999966

Parameter	Units	10160655005 Result	Dup Result	RPD	Max RPD	Qualifiers
Total Dissolved Solids	mg/L	34.0	29.0	16	20	

SAMPLE DUPLICATE: 999967

Parameter	Units	10160655006 Result	Dup Result	RPD	Max RPD	Qualifiers
Total Dissolved Solids	mg/L	34.0	32.0	6	20	

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QUALIFIERS

Project: Black Pine Mine
Pace Project No.: 10160655

DEFINITIONS

DF - Dilution Factor, if reported, represents the factor applied to the reported data due to changes in sample preparation, dilution of the sample aliquot, or moisture content.

ND - Not Detected at or above adjusted reporting limit.

J - Estimated concentration above the adjusted method detection limit and below the adjusted reporting limit.

MDL - Adjusted Method Detection Limit.

S - Surrogate

1,2-Diphenylhydrazine (8270 listed analyte) decomposes to Azobenzene.

Consistent with EPA guidelines, unrounded data are displayed and have been used to calculate % recovery and RPD values.

LCS(D) - Laboratory Control Sample (Duplicate)

MS(D) - Matrix Spike (Duplicate)

DUP - Sample Duplicate

RPD - Relative Percent Difference

NC - Not Calculable.

SG - Silica Gel - Clean-Up

U - Indicates the compound was analyzed for, but not detected.

N-Nitrosodiphenylamine decomposes and cannot be separated from Diphenylamine using Method 8270. The result reported for each analyte is a combined concentration.

LABORATORIES

PASI-M	Pace Analytical Services - Minneapolis
PASI-MT	Pace Analytical Services - Montana

ANALYTE QUALIFIERS

D6	The relative percent difference (RPD) between the sample and sample duplicate exceeded laboratory control limits.
M1	Matrix spike recovery exceeded QC limits. Batch accepted based on laboratory control sample (LCS) recovery.

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QUALITY CONTROL DATA CROSS REFERENCE TABLE

Project: Black Pine Mine
Pace Project No.: 10160655

Lab ID	Sample ID	QC Batch Method	QC Batch	Analytical Method	Analytical Batch
10160655001	**CML-SW-07**	EPA 200.8	MPRP/26726	EPA 200.8	ICPM/10928
10160655002	**CML-SW-03**	EPA 200.8	MPRP/26726	EPA 200.8	ICPM/10928
10160655003	**CML-SW-08**	EPA 200.8	MPRP/26726	EPA 200.8	ICPM/10928
10160655004	**CML-SW-10**	EPA 200.8	MPRP/26726	EPA 200.8	ICPM/10928
10160655005	**CML-SW-16**	EPA 200.8	MPRP/26726	EPA 200.8	ICPM/10928
10160655006	**CML-SW-15**	EPA 200.8	MPRP/26726	EPA 200.8	ICPM/10928
10160655007	**CML-Q1-T1**	EPA 200.8	MPRP/26726	EPA 200.8	ICPM/10928
10160655008	**CML-SW-04**	EPA 200.8	MPRP/26726	EPA 200.8	ICPM/10928
10160655009	**CML-SW-13**	EPA 200.8	MPRP/26726	EPA 200.8	ICPM/10928
10160655010	**CML-SW-05**	EPA 200.8	MPRP/26726	EPA 200.8	ICPM/10928
10160655011	**CML-SW-11**	EPA 200.8	MPRP/26726	EPA 200.8	ICPM/10928
10160655001	**CML-SW-07**	SM 2310	MT/6228		
10160655002	**CML-SW-03**	SM 2310	MT/6228		
10160655003	**CML-SW-08**	SM 2310	MT/6228		
10160655004	**CML-SW-10**	SM 2310	MT/6228		
10160655005	**CML-SW-16**	SM 2310	MT/6228		
10160655006	**CML-SW-15**	SM 2310	MT/6228		
10160655008	**CML-SW-04**	SM 2310	MT/6228		
10160655009	**CML-SW-13**	SM 2310	MT/6228		
10160655010	**CML-SW-05**	SM 2310	MT/6228		
10160655011	**CML-SW-11**	SM 2310	MT/6228		
10160655001	**CML-SW-07**	SM 2540D	MT/6192		
10160655002	**CML-SW-03**	SM 2540D	MT/6192		
10160655003	**CML-SW-08**	SM 2540D	MT/6192		
10160655004	**CML-SW-10**	SM 2540D	MT/6192		
10160655005	**CML-SW-16**	SM 2540D	MT/6192		
10160655006	**CML-SW-15**	SM 2540D	MT/6192		
10160655008	**CML-SW-04**	SM 2540D	MT/6192		
10160655009	**CML-SW-13**	SM 2540D	MT/6192		
10160655010	**CML-SW-05**	SM 2540D	MT/6192		
10160655011	**CML-SW-11**	SM 2540D	MT/6192		
10160655001	**CML-SW-07**	EPA 300.0	MT/6195		
10160655002	**CML-SW-03**	EPA 300.0	MT/6195		
10160655003	**CML-SW-08**	EPA 300.0	MT/6195		
10160655004	**CML-SW-10**	EPA 300.0	MT/6195		
10160655005	**CML-SW-16**	EPA 300.0	MT/6195		
10160655006	**CML-SW-15**	EPA 300.0	MT/6195		
10160655008	**CML-SW-04**	EPA 300.0	MT/6195		
10160655009	**CML-SW-13**	EPA 300.0	MT/6195		
10160655010	**CML-SW-05**	EPA 300.0	MT/6195		
10160655011	**CML-SW-11**	EPA 300.0	MT/6195		
10160655001	**CML-SW-07**	SM 2320B	WET/22674		
10160655002	**CML-SW-03**	SM 2320B	WET/22674		
10160655003	**CML-SW-08**	SM 2320B	WET/22674		
10160655004	**CML-SW-10**	SM 2320B	WET/22674		
10160655005	**CML-SW-16**	SM 2320B	WET/22674		
10160655006	**CML-SW-15**	SM 2320B	WET/22674		

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QUALITY CONTROL DATA CROSS REFERENCE TABLE

Project: Black Pine Mine
Pace Project No.: 10160655

Lab ID	Sample ID	QC Batch Method	QC Batch	Analytical Method	Analytical Batch
10160655008	**CML-SW-04**	SM 2320B	WET/22674		
10160655009	**CML-SW-13**	SM 2320B	WET/22674		
10160655010	**CML-SW-05**	SM 2320B	WET/22674		
10160655011	**CML-SW-11**	SM 2320B	WET/22674		
10160655001	**CML-SW-07**	SM 2540C	WET/22678		
10160655002	**CML-SW-03**	SM 2540C	WET/22678		
10160655003	**CML-SW-08**	SM 2540C	WET/22678		
10160655004	**CML-SW-10**	SM 2540C	WET/22678		
10160655005	**CML-SW-16**	SM 2540C	WET/22692		
10160655006	**CML-SW-15**	SM 2540C	WET/22692		
10160655008	**CML-SW-04**	SM 2540C	WET/22692		
10160655009	**CML-SW-13**	SM 2540C	WET/22692		
10160655010	**CML-SW-05**	SM 2540C	WET/22692		
10160655011	**CML-SW-11**	SM 2540C	WET/22692		

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Section A Required Client Information:	Section B Required Project Information:	Section C Invoice Information:
Company: Herrera	Report To: Kevin Houck	Attention:
Address:	Copy To:	Company Name: DEQ
		Address:
Email To:	Purchase Order No.:	Pace Quote Reference:
Phone: Fax:	Project Name:	Pace Project Manager:
Requested Due Date/TAT:	Project Number:	Pace Profile #:

REGULATORY AGENCY

☐ NPDES ☐ GROUND WATER ☐ DRINKING WATER

☐ UST ☐ RCRA ☐ OTHER _____

Site Location STATE: _____

Requested Analysis Filtered (Y/N)

ITEM #	Section D Required Client Information — SAMPLE ID (A-Z, 0-9 / ,-) Sample IDs MUST BE UNIQUE	Matrix Codes MATRIX / CODE: Drinking Water DW; Water WT; Waste Water WW; Product P; Soil/Solid SL; Oil OL; Wipe WP; Air AR; Tissue TS; Other OT	MATRIX CODE (see valid codes to left)	SAMPLE TYPE (G=GRAB C=COMP)	COLLECTED: COMPOSITE START DATE	COMPOSITE START TIME	COMPOSITE END/GRAB DATE	COMPOSITE END/GRAB TIME	SAMPLE TEMP AT COLLECTION	# OF CONTAINERS	Preservatives: Unpreserved	H_2SO_4	HNO_3	HCl	NaOH	$Na_2S_2O_3$	Methanol	Other	Analysis Test ↓ Y/N	TSS	TDS	Alk	Acidity	Sulfate	Total Metals	Metals (solid)	Residual Chlorine (Y/N)	Pace Project No./ Lab I.D.
																				Y/N	N	N				Y	N		
1	CML-SW-07		WW	G			6/14/11	1005		4	X		X								X	X		X		X			001
2	CML-SW-03						6/15/11	0820		4	X		X								X	X		X		X			002
3	CML-SW-08						6/15/11	1520		4	X		X								X	X		X		X			003
4	CML-SW-10							1451		4	X		X								X	X		X		X			004
5	CML-SW-16							1409		4	X		X								X	X		X		X			005
6																													
7																													
8																													
9																													
10																													
11																													
12																													

ADDITIONAL COMMENTS	RELINQUISHED BY / AFFILIATION	DATE	TIME	ACCEPTED BY / AFFILIATION	DATE	TIME	SAMPLE CONDITIONS: Temp in °C	Received on Ice (Y/N)	Custody Sealed Cooler (Y/N)	Samples Intact (Y/N)
ALL "SML" on bottles should be "CML".	GJ Catena / Herrera	6/16/11	1130				24	5	5	5
	FedEx	6/17/11	0850	Dennis Price	6/17/11	0850				

ORIGINAL

SAMPLER NAME AND SIGNATURE

PRINT Name of SAMPLER: Gina Catena

SIGNATURE of SAMPLER: GJ Catena DATE Signed (MM/DD/YY): 6/16/11

*Important Note: By signing this form you are accepting Pace's NET 30 day payment terms and agreeing to late charges of 1.5% per month for any invoices not paid within 30 days.

F-ALL-Q-020rev.07, 15-May-2007

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CHAIN-OF-CUSTODY / Analytical Request Document

The Chain-of-Custody is a LEGAL DOCUMENT. All relevant fields must be completed accurately.

Page: 1 of 1

1321622

Section A Required Client Information:	Section B Required Project Information:	Section C Invoice Information:
Company: Herrera	Report To: Kevin Houck	Attention:
Address:	Copy To: "	Company Name: DEQ
		Address:
Email To:	Purchase Order No.:	Pace Quote Reference:
Phone: Fax:	Project Name:	Pace Project Manager:
Requested Due Date/TAT:	Project Number:	Pace Profile #:

REGULATORY AGENCY

☐ NPDES ☐ GROUND WATER ☐ DRINKING WATER

☐ UST ☐ RCRA ☐ OTHER _____

Site Location STATE: _____

Section D Required Client Information

SAMPLE ID
(A-Z, 0-9 / ,-)
Sample IDs MUST BE UNIQUE

Matrix Codes (MATRIX / CODE): Drinking Water DW; Water WT; Waste Water WW; Product P; Soil/Solid SL; Oil OL; Wipe WP; Air AR; Tissue TS; Other OT

Requested Analysis Filtered (Y/N)

ITEM #	SAMPLE ID	MATRIX CODE (see valid codes to left)	SAMPLE TYPE (G=GRAB C=COMP)	COLLECTED COMPOSITE START DATE	COLLECTED COMPOSITE START TIME	COLLECTED COMPOSITE END/GRAB DATE	COLLECTED COMPOSITE END/GRAB TIME	SAMPLE TEMP AT COLLECTION	# OF CONTAINERS	Preservatives: Unpreserved	H_2SO_4	HNO_3	HCl	NaOH	$Na_2S_2O_3$	Methanol	Other	Analysis Test Y/N: TSS	TDS	Alk	Acidity	Total Metals	Metals (solid)	Residual Chlorine (Y/N)	Pace Project No./ Lab I.D.
1	CML-SW-15	W	G			6/15/11	1335		4	X		X						X	X	X	X				1016655 006
2	CML-Q1-T1						1399		1			X									X					007
3	CML-SW-04						1320		4	X		X						X	X	X	X					008
4	CML-SW-13						1239		4	X		X						X	X	X	X					009
5	CML-SW-05						1235		4	X		X						X	X	X	X					010
6	CML-SW-11						1416		4	X		X						X	X	X	X					011
7																										
8																										
9																										
10																										
11																										
12																										

ADDITIONAL COMMENTS	RELINQUISHED BY / AFFILIATION	DATE	TIME	ACCEPTED BY / AFFILIATION	DATE	TIME	SAMPLE CONDITIONS			
All "SML" on bottles should be "CML"	KD Cate / Herrera	6/16/11	1130				40	Y	Y	Y
	Fed Ex	6/17/11	0850	Jennifer Pace	6/17/11	0850				

ORIGINAL

SAMPLER NAME AND SIGNATURE

PRINT Name of SAMPLER: Gina Catarra

SIGNATURE of SAMPLER: KD Cate DATE Signed (MM/DD/YY): 6/16/11

Temp in °C | Received on Ice (Y/N) | Custody Sealed Cooler (Y/N) | Samples Intact (Y/N)

*Important Note: By signing this form you are accepting Pace's NET 30 day payment terms and agreeing to late charges of 1.5% per month for any invoices not paid within 30 days.

F-ALL-Q-020rev.07, 15-May-2007

Sample Condition Upon Receipt

Pace Analytical

Client Name: Herren Env Project # 10160655

Courier: ☒ Fed Ex ☐ UPS ☐ USPS ☐ Client ☐ Commercial ☐ Pace Other _____

Tracking #: 879718460097295

[redacted]

Custody Seal on Cooler/Box Present: ☑ yes ☐ no Seals intact: ☑ yes ☐ no

Packing Material: ☐ Bubble Wrap ☐ Bubble Bags ☑ None ☐ Other _____ Temp Blank: Yes ✓ No _____

Thermometer Used 1383045 or 135 **Type of Ice:** (Wet) Blue None ☐ Samples on ice, cooling process has begun

Cooler Temperature 4.0 2.4 **Biological Tissue is Frozen:** Yes No

Temp should be above freezing to 6°C

Date and Initials of person examining contents: 6/18/11 M

Comments:

Chain of Custody Present:	☑Yes ☐No ☐N/A	1.
Chain of Custody Filled Out:	☑Yes ☐No ☐N/A	2.
Chain of Custody Relinquished:	☑Yes ☐No ☐N/A	3.
Sampler Name & Signature on COC:	☑Yes ☐No ☐N/A	4.
Samples Arrived within Hold Time:	☑Yes ☐No ☐N/A	5.
Short Hold Time Analysis (<72hr):	☐Yes ☑No ☐N/A	6.
Rush Turn Around Time Requested:	☐Yes ☑No ☐N/A	7.
Sufficient Volume:	☑Yes ☐No ☐N/A	8.
Correct Containers Used:	☑Yes ☐No ☐N/A	9.
-Pace Containers Used:	☑Yes ☐No ☐N/A	
Containers Intact:	☑Yes ☐No ☐N/A	10.
Filtered volume received for Dissolved tests	☐Yes ☐No ☑N/A	11.
Sample Labels match COC:	☑Yes ☐No ☐N/A	12.
-Includes date/time/ID/Analysis Matrix: WW		
All containers needing acid/base preservation have been checked. Noncompliance are noted in 13.	☑Yes ☐No ☐N/A	13. ☑ HNO3 ☐ H2SO4 ☐ NaOH ☐ HCl
All containers needing preservation are found to be in compliance with EPA recommendation.	☑Yes ☐No ☐N/A	Samp # 6of6 11of11 MB 6/17/11
Exceptions: VOA,Coliform, TOC, Oil and Grease, WI-DRO (water)	☐Yes ☑No	Initial when completed / Lot # of added preservative
Samples checked for dechlorination:	☐Yes ☐No ☑N/A	14.
Headspace in VOA Vials (>6mm):	☐Yes ☐No ☑N/A	15.
Trip Blank Present:	☐Yes ☐No ☑N/A	16.
Trip Blank Custody Seals Present	☐Yes ☐No ☑N/A	
Pace Trip Blank Lot # (if purchased):		

Client Notification/ Resolution: Field Data Required? Y / N

Person Contacted: _____ Date/Time: _____

Comments/ Resolution: _____

Project Manager Review: _____ **Date:** 6-20-11

Note: Whenever there is a discrepancy affecting North Carolina compliance samples, a copy of this form will be sent to the North Carolina DEHNR Certification Office (i.e out of hold, incorrect preservative, out of temp, incorrect containers)

Pace Analytical Services, Inc.
602 S 25th Street
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(406)254-7226

October 06, 2011

Kevin Houck
Herrera Environmental Consultants
101 East Broadway, Suite 610
Missoula, MT 59802

RE: Project: Black Pine Mine
Pace Project No.: 10160655

Dear Kevin Houck:
Enclosed are the analytical results for sample(s) received by the laboratory on June 17, 2011. The results relate only to the samples included in this report.

REVISION-add hardness to samples BP-CML-SW-05 and BP-CML-SW-15.

If you have any questions concerning this report, please feel free to contact me.

Sincerely,

Carol Davy

carol.davy@pacelabs.com
Project Manager

Enclosures

cc: Devin Clary, Montana Dept. of Environmental Quality
Mark Donner, Trihydro
Jamie Mongoven, Montana Dept. of Environmental

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CERTIFICATIONS

Project: Black Pine Mine
Pace Project No.: 10160655

Minnesota Certification IDs

1700 Elm Street SE Suite 200, Minneapolis, MN 55414
A2LA Certification #: 2926.01
Alaska Certification #: UST-078
Alaska Certification #MN00064
Arizona Certification #: AZ-0014
Arkansas Certification #: 88-0680
California Certification #: 01155CA
EPA Region 8 Certification #: Pace
Florida/NELAP Certification #: E87605
Georgia Certification #: 959
Idaho Certification #: MN00064
Illinois Certification #: 200011
Iowa Certification #: 368
Kansas Certification #: E-10167
Louisiana Certification #: 03086
Louisiana Certification #: LA080009
Maine Certification #: 2007029
Maryland Certification #: 322
Michigan DEQ Certification #: 9909
Minnesota Certification #: 027-053-137
Mississippi Certification #: Pace
Montana Certification #: MT CERT0092
Nevada Certification #: MN_00064
Nebraska Certification #: Pace
New Jersey Certification #: MN-002
New Mexico Certification #: Pace
New York Certification #: 11647
North Carolina Certification #: 530
North Dakota Certification #: R-036
North Dakota Certification #: R-036A
Ohio VAP Certification #: CL101
Oklahoma Certification #: D9921
Oklahoma Certification #: 9507
Oregon Certification #: MN200001
Pennsylvania Certification #: 68-00563
Puerto Rico Certification
Tennessee Certification #: 02818
Texas Certification #: T104704192
Washington Certification #: C754
Wisconsin Certification #: 999407970

Montana Certification IDs

602 South 25th Street, Billings, MT 59101
EPA Region 8 Certification #: 8TMS-Q
Idaho Certification #: MT00012
Montana Certification #: MT CERT0040
NVLAP Certification #: 101292-0
Minnesota Dept of Health Certification #: 030-999-442

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SAMPLE SUMMARY

Project: Black Pine Mine
Pace Project No.: 10160655

Lab ID	Sample ID	Matrix	Date Collected	Date Received
10160655001	**CML-SW-07**	Water	06/14/11 10:05	06/17/11 08:50
10160655002	**CML-SW-03**	Water	06/15/11 08:20	06/17/11 08:50
10160655003	**CML-SW-08**	Water	06/15/11 15:20	06/17/11 08:50
10160655004	**CML-SW-10**	Water	06/15/11 14:51	06/17/11 08:50
10160655005	**CML-SW-16**	Water	06/15/11 14:09	06/17/11 08:50
10160655006	**CML-SW-15**	Water	06/15/11 13:35	06/17/11 08:50
10160655007	**CML-Q1-T1**	Water	06/15/11 13:39	06/17/11 08:50
10160655008	**CML-SW-04**	Water	06/15/11 13:20	06/17/11 08:50
10160655009	**CML-SW-13**	Water	06/15/11 12:39	06/17/11 08:50
10160655010	**CML-SW-05**	Water	06/15/11 12:35	06/17/11 08:50
10160655011	**CML-SW-11**	Water	06/15/11 14:16	06/17/11 08:50

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SAMPLE ANALYTE COUNT

Project: Black Pine Mine
Pace Project No.: 10160655

Lab ID	Sample ID	Method	Analysts	Analytes Reported	Laboratory
10160655001	**CML-SW-07**	EPA 200.8	CJS, TL1	12	PASI-M
		SM 2310	CAC	1	PASI-MT
		SM 2540D	SR1	1	PASI-MT
		EPA 300.0	JH1	1	PASI-MT
		SM 2320B	MWD	1	PASI-M
		SM 2540C	PH1	1	PASI-M
10160655002	**CML-SW-03**	EPA 200.8	CJS, TL1	12	PASI-M
		SM 2310	CAC	1	PASI-MT
		SM 2540D	SR1	1	PASI-MT
		EPA 300.0	JH1	1	PASI-MT
		SM 2320B	MWD	1	PASI-M
		SM 2540C	PH1	1	PASI-M
10160655003	**CML-SW-08**	EPA 200.8	CJS, TL1	12	PASI-M
		SM 2310	CAC	1	PASI-MT
		SM 2540D	SR1	1	PASI-MT
		EPA 300.0	JH1	1	PASI-MT
		SM 2320B	MWD	1	PASI-M
		SM 2540C	PH1	1	PASI-M
10160655004	**CML-SW-10**	EPA 200.8	CJS, TL1	12	PASI-M
		SM 2310	CAC	1	PASI-MT
		SM 2540D	SR1	1	PASI-MT
		EPA 300.0	JH1	1	PASI-MT
		SM 2320B	MWD	1	PASI-M
		SM 2540C	PH1	1	PASI-M
10160655005	**CML-SW-16**	EPA 200.8	CJS, TL1	12	PASI-M
		SM 2310	CAC	1	PASI-MT
		SM 2540D	SR1	1	PASI-MT
		EPA 300.0	JH1	1	PASI-MT
		SM 2320B	MWD	1	PASI-M
		SM 2540C	CAP	1	PASI-M
10160655006	**CML-SW-15**	EPA 200.8	CJS, TL1	13	PASI-M
		SM 2310	CAC	1	PASI-MT
		SM 2540D	SR1	1	PASI-MT
		EPA 300.0	JH1	1	PASI-MT
		SM 2320B	MWD	1	PASI-M
		SM 2540C	CAP	1	PASI-M
10160655007	**CML-Q1-T1**	EPA 200.8	CJS, TL1	12	PASI-M

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SAMPLE ANALYTE COUNT

Project: Black Pine Mine
Pace Project No.: 10160655

Lab ID	Sample ID	Method	Analysts	Analytes Reported	Laboratory
10160655008	**CML-SW-04**	EPA 200.8	CJS, TL1	12	PASI-M
		SM 2310	CAC	1	PASI-MT
		SM 2540D	SR1	1	PASI-MT
		EPA 300.0	JH1	1	PASI-MT
		SM 2320B	MWD	1	PASI-M
		SM 2540C	CAP	1	PASI-M
10160655009	**CML-SW-13**	EPA 200.8	CJS, TL1	12	PASI-M
		SM 2310	CAC	1	PASI-MT
		SM 2540D	SR1	1	PASI-MT
		EPA 300.0	JH1	1	PASI-MT
		SM 2320B	MWD	1	PASI-M
		SM 2540C	CAP	1	PASI-M
10160655010	**CML-SW-05**	EPA 200.8	CJS, TL1	13	PASI-M
		SM 2310	CAC	1	PASI-MT
		SM 2540D	SR1	1	PASI-MT
		EPA 300.0	JH1	1	PASI-MT
		SM 2320B	MWD	1	PASI-M
		SM 2540C	CAP	1	PASI-M
10160655011	**CML-SW-11**	EPA 200.8	CJS, TL1	12	PASI-M
		SM 2310	CAC	1	PASI-MT
		SM 2540D	SR1	1	PASI-MT
		EPA 300.0	JH1	1	PASI-MT
		SM 2320B	MWD	1	PASI-M
		SM 2540C	CAP	1	PASI-M

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PROJECT NARRATIVE

Project: Black Pine Mine
Pace Project No.: 10160655

Method: **EPA 200.8**
Description: 200.8 MET ICPMS
Client: Montana Dept. of Environmental Quality
Date: October 06, 2011

General Information:
11 samples were analyzed for EPA 200.8. All samples were received in acceptable condition with any exceptions noted below.

Hold Time:
The samples were analyzed within the method required hold times with any exceptions noted below.

Sample Preparation:
The samples were prepared in accordance with EPA 200.8 with any exceptions noted below.

Initial Calibrations (including MS Tune as applicable):
All criteria were within method requirements with any exceptions noted below.

Continuing Calibration:
All criteria were within method requirements with any exceptions noted below.

Internal Standards:
All internal standards were within QC limits with any exceptions noted below.

Method Blank:
All analytes were below the report limit in the method blank with any exceptions noted below.

Laboratory Control Spike:
All laboratory control spike compounds were within QC limits with any exceptions noted below.

Matrix Spikes:
All percent recoveries and relative percent differences (RPDs) were within acceptance criteria with any exceptions noted below.

QC Batch: MPRP/26726

A matrix spike and matrix spike duplicate (MS/MSD) were performed on the following sample(s): 10160655001,10160673004

M1: Matrix spike recovery exceeded QC limits. Batch accepted based on laboratory control sample (LCS) recovery.

- MS (Lab ID: 998292)
  - Iron
- MS (Lab ID: 998294)
  - Iron
- MSD (Lab ID: 998293)
  - Iron

Duplicate Sample:
All duplicate sample results were within method acceptance criteria with any exceptions noted below.

Additional Comments:

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PROJECT NARRATIVE

Project: Black Pine Mine
Pace Project No.: 10160655

Method: **SM 2310**
Description: 2310 Acidity
Client: Montana Dept. of Environmental Quality
Date: October 06, 2011

General Information:
10 samples were analyzed for SM 2310. All samples were received in acceptable condition with any exceptions noted below.

Hold Time:
The samples were analyzed within the method required hold times with any exceptions noted below.

Initial Calibrations (including MS Tune as applicable):
All criteria were within method requirements with any exceptions noted below.

Continuing Calibration:
All criteria were within method requirements with any exceptions noted below.

Internal Standards:
All internal standards were within QC limits with any exceptions noted below.

Surrogates:
All surrogates were within QC limits with any exceptions noted below.

Method Blank:
All analytes were below the report limit in the method blank with any exceptions noted below.

Laboratory Control Spike:
All laboratory control spike compounds were within QC limits with any exceptions noted below.

Matrix Spikes:
All percent recoveries and relative percent differences (RPDs) were within acceptance criteria with any exceptions noted below.

Duplicate Sample:
All duplicate sample results were within method acceptance criteria with any exceptions noted below.

Additional Comments:

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PROJECT NARRATIVE

Project: Black Pine Mine
Pace Project No.: 10160655

Method: **SM 2540D**
Description: 2540D Total Suspended Solids
Client: Montana Dept. of Environmental Quality
Date: October 06, 2011

General Information:
10 samples were analyzed for SM 2540D. All samples were received in acceptable condition with any exceptions noted below.

Hold Time:
The samples were analyzed within the method required hold times with any exceptions noted below.

Initial Calibrations (including MS Tune as applicable):
All criteria were within method requirements with any exceptions noted below.

Continuing Calibration:
All criteria were within method requirements with any exceptions noted below.

Internal Standards:
All internal standards were within QC limits with any exceptions noted below.

Surrogates:
All surrogates were within QC limits with any exceptions noted below.

Method Blank:
All analytes were below the report limit in the method blank with any exceptions noted below.

Laboratory Control Spike:
All laboratory control spike compounds were within QC limits with any exceptions noted below.

Matrix Spikes:
All percent recoveries and relative percent differences (RPDs) were within acceptance criteria with any exceptions noted below.

Duplicate Sample:
All duplicate sample results were within method acceptance criteria with any exceptions noted below.

Additional Comments:

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PROJECT NARRATIVE

Project: Black Pine Mine
Pace Project No.: 10160655

Method: **EPA 300.0**
Description: 300.0 IC Anions
Client: Montana Dept. of Environmental Quality
Date: October 06, 2011

General Information:
10 samples were analyzed for EPA 300.0. All samples were received in acceptable condition with any exceptions noted below.

Hold Time:
The samples were analyzed within the method required hold times with any exceptions noted below.

Initial Calibrations (including MS Tune as applicable):
All criteria were within method requirements with any exceptions noted below.

Continuing Calibration:
All criteria were within method requirements with any exceptions noted below.

Internal Standards:
All internal standards were within QC limits with any exceptions noted below.

Surrogates:
All surrogates were within QC limits with any exceptions noted below.

Method Blank:
All analytes were below the report limit in the method blank with any exceptions noted below.

Laboratory Control Spike:
All laboratory control spike compounds were within QC limits with any exceptions noted below.

Matrix Spikes:
All percent recoveries and relative percent differences (RPDs) were within acceptance criteria with any exceptions noted below.

Duplicate Sample:
All duplicate sample results were within method acceptance criteria with any exceptions noted below.

QC Batch: MT/6195

D6: The relative percent difference (RPD) between the sample and sample duplicate exceeded laboratory control limits.

- DUP (Lab ID: 998641)
  - Sulfate

Additional Comments:

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PROJECT NARRATIVE

Project: Black Pine Mine
Pace Project No.: 10160655

Method: **SM 2320B**
Description: 2320B Alkalinity
Client: Montana Dept. of Environmental Quality
Date: October 06, 2011

General Information:
10 samples were analyzed for SM 2320B. All samples were received in acceptable condition with any exceptions noted below.

Hold Time:
The samples were analyzed within the method required hold times with any exceptions noted below.

Method Blank:
All analytes were below the report limit in the method blank with any exceptions noted below.

Laboratory Control Spike:
All laboratory control spike compounds were within QC limits with any exceptions noted below.

Matrix Spikes:
All percent recoveries and relative percent differences (RPDs) were within acceptance criteria with any exceptions noted below.

QC Batch: WET/22674

A matrix spike and matrix spike duplicate (MS/MSD) were performed on the following sample(s): 10160707001,10160722002

M1: Matrix spike recovery exceeded QC limits. Batch accepted based on laboratory control sample (LCS) recovery.

- MS (Lab ID: 998343)
  - Alkalinity, Total as CaCO3
- MSD (Lab ID: 998344)
  - Alkalinity, Total as CaCO3

Duplicate Sample:
All duplicate sample results were within method acceptance criteria with any exceptions noted below.

Additional Comments:

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PROJECT NARRATIVE

Project: Black Pine Mine
Pace Project No.: 10160655

Method: **SM 2540C**
Description: 2540C Total Dissolved Solids
Client: Montana Dept. of Environmental Quality
Date: October 06, 2011

General Information:
10 samples were analyzed for SM 2540C. All samples were received in acceptable condition with any exceptions noted below.

Hold Time:
The samples were analyzed within the method required hold times with any exceptions noted below.

Method Blank:
All analytes were below the report limit in the method blank with any exceptions noted below.

Laboratory Control Spike:
All laboratory control spike compounds were within QC limits with any exceptions noted below.

Matrix Spikes:
All percent recoveries and relative percent differences (RPDs) were within acceptance criteria with any exceptions noted below.

Duplicate Sample:
All duplicate sample results were within method acceptance criteria with any exceptions noted below.

Additional Comments:

This data package has been reviewed for quality and completeness and is approved for release.

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ANALYTICAL RESULTS

Project: Black Pine Mine
Pace Project No.: 10160655

Sample: CML-SW-07 **Lab ID: 10160655001** Collected: 06/14/11 10:05 Received: 06/17/11 08:50 Matrix: Water

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
200.8 MET ICPMS	Analytical Method: EPA 200.8 Preparation Method: EPA 200.8							
Antimony	**42.9**	ug/L	0.50	1	06/28/11 15:18	06/30/11 05:30	7440-36-0	
Arsenic	**12.8**	ug/L	0.50	1	06/28/11 15:18	06/30/11 05:30	7440-38-2	
Barium	**81.7**	ug/L	0.30	1	06/28/11 15:18	06/30/11 05:30	7440-39-3	
Cadmium	**1.2**	ug/L	0.080	1	06/28/11 15:18	06/30/11 05:30	7440-43-9	
Chromium	**1.3**	ug/L	0.50	1	06/28/11 15:18	06/30/11 05:30	7440-47-3	
Copper	**221**	ug/L	0.50	1	06/28/11 15:18	06/30/11 05:30	7440-50-8	
Iron	**1430**	ug/L	50.0	1	06/28/11 15:18	06/30/11 05:30	7439-89-6	M1
Lead	**49.0**	ug/L	0.10	1	06/28/11 15:18	06/30/11 05:30	7439-92-1	
Manganese	**12.9**	ug/L	0.50	1	06/28/11 15:18	06/30/11 05:30	7439-96-5	
Nickel	**2.1**	ug/L	0.50	1	06/28/11 15:18	06/30/11 05:30	7440-02-0	
Silver	**0.64**	ug/L	0.50	1	06/28/11 15:18	06/30/11 13:56	7440-22-4	
Zinc	**40.5**	ug/L	5.0	1	06/28/11 15:18	06/30/11 05:30	7440-66-6	
2310 Acidity	Analytical Method: SM 2310							
Acidity	**23.4**	mg/L	5.0	1		06/24/11 16:00		
2540D Total Suspended Solids	Analytical Method: SM 2540D							
Total Suspended Solids	**1.8**	mg/L	1.0	1		06/20/11 10:40		
300.0 IC Anions	Analytical Method: EPA 300.0							
Sulfate	**8.0**	mg/L	1.0	1		06/24/11 09:10	14808-79-8	
2320B Alkalinity	Analytical Method: SM 2320B							
Alkalinity, Total as CaCO3	**12.1**	mg/L	5.0	1		06/20/11 11:46		
2540C Total Dissolved Solids	Analytical Method: SM 2540C							
Total Dissolved Solids	**94.0**	mg/L	10.0	1		06/20/11 11:21		

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ANALYTICAL RESULTS

Project: Black Pine Mine
Pace Project No.: 10160655

Sample: CML-SW-03 **Lab ID: 10160655002** Collected: 06/15/11 08:20 Received: 06/17/11 08:50 Matrix: Water

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
200.8 MET ICPMS	Analytical Method: EPA 200.8 Preparation Method: EPA 200.8							
Antimony	**1.9**	ug/L	0.50	1	06/28/11 15:18	06/30/11 05:17	7440-36-0	
Arsenic	**2.3**	ug/L	0.50	1	06/28/11 15:18	06/30/11 05:17	7440-38-2	
Barium	**59.1**	ug/L	0.30	1	06/28/11 15:18	06/30/11 05:17	7440-39-3	
Cadmium	**<0.080**	ug/L	0.080	1	06/28/11 15:18	06/30/11 05:17	7440-43-9	
Chromium	**1.2**	ug/L	0.50	1	06/28/11 15:18	06/30/11 05:17	7440-47-3	
Copper	**20.8**	ug/L	0.50	1	06/28/11 15:18	06/30/11 05:17	7440-50-8	
Iron	**1450**	ug/L	50.0	1	06/28/11 15:18	06/30/11 05:17	7439-89-6	
Lead	**2.9**	ug/L	0.10	1	06/28/11 15:18	06/30/11 05:17	7439-92-1	
Manganese	**8.8**	ug/L	0.50	1	06/28/11 15:18	06/30/11 05:17	7439-96-5	
Nickel	**1.7**	ug/L	0.50	1	06/28/11 15:18	06/30/11 05:17	7440-02-0	
Silver	**<0.50**	ug/L	0.50	1	06/28/11 15:18	06/30/11 13:59	7440-22-4	
Zinc	**10.5**	ug/L	5.0	1	06/28/11 15:18	06/30/11 05:17	7440-66-6	
2310 Acidity	Analytical Method: SM 2310							
Acidity	**13.9**	mg/L	5.0	1		06/24/11 16:00		
2540D Total Suspended Solids	Analytical Method: SM 2540D							
Total Suspended Solids	**2.0**	mg/L	1.0	1		06/20/11 10:40		
300.0 IC Anions	Analytical Method: EPA 300.0							
Sulfate	**6.7**	mg/L	1.0	1		06/24/11 02:03	14808-79-8	
2320B Alkalinity	Analytical Method: SM 2320B							
Alkalinity, Total as CaCO3	**11.7**	mg/L	5.0	1		06/20/11 12:27		
2540C Total Dissolved Solids	Analytical Method: SM 2540C							
Total Dissolved Solids	**103**	mg/L	10.0	1		06/20/11 11:28		

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ANALYTICAL RESULTS

Project: Black Pine Mine
Pace Project No.: 10160655

Sample: CML-SW-08 **Lab ID: 10160655003** Collected: 06/15/11 15:20 Received: 06/17/11 08:50 Matrix: Water

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
200.8 MET ICPMS	Analytical Method: EPA 200.8 Preparation Method: EPA 200.8							
Antimony	**3.4**	ug/L	0.50	1	06/28/11 15:18	06/30/11 05:21	7440-36-0	
Arsenic	**1.7**	ug/L	0.50	1	06/28/11 15:18	06/30/11 05:21	7440-38-2	
Barium	**37.7**	ug/L	0.30	1	06/28/11 15:18	06/30/11 05:21	7440-39-3	
Cadmium	**0.12**	ug/L	0.080	1	06/28/11 15:18	06/30/11 05:21	7440-43-9	
Chromium	**0.68**	ug/L	0.50	1	06/28/11 15:18	06/30/11 05:21	7440-47-3	
Copper	**16.7**	ug/L	0.50	1	06/28/11 15:18	06/30/11 05:21	7440-50-8	
Iron	**381**	ug/L	50.0	1	06/28/11 15:18	06/30/11 05:21	7439-89-6	
Lead	**3.7**	ug/L	0.10	1	06/28/11 15:18	06/30/11 05:21	7439-92-1	
Manganese	**5.8**	ug/L	0.50	1	06/28/11 15:18	06/30/11 05:21	7439-96-5	
Nickel	**0.72**	ug/L	0.50	1	06/28/11 15:18	06/30/11 05:21	7440-02-0	
Silver	**<0.50**	ug/L	0.50	1	06/28/11 15:18	06/30/11 14:03	7440-22-4	
Zinc	**12.5**	ug/L	5.0	1	06/28/11 15:18	06/30/11 05:21	7440-66-6	
2310 Acidity	Analytical Method: SM 2310							
Acidity	**16.7**	mg/L	5.0	1		06/24/11 16:00		
2540D Total Suspended Solids	Analytical Method: SM 2540D							
Total Suspended Solids	**2.1**	mg/L	1.0	1		06/20/11 10:40		
300.0 IC Anions	Analytical Method: EPA 300.0							
Sulfate	**3.4**	mg/L	1.0	1		06/24/11 02:31	14808-79-8	
2320B Alkalinity	Analytical Method: SM 2320B							
Alkalinity, Total as CaCO3	**7.4**	mg/L	5.0	1		06/20/11 12:30		
2540C Total Dissolved Solids	Analytical Method: SM 2540C							
Total Dissolved Solids	**50.0**	mg/L	10.0	1		06/20/11 11:31		

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ANALYTICAL RESULTS

Project: Black Pine Mine
Pace Project No.: 10160655

Sample: CML-SW-10 **Lab ID: 10160655004** Collected: 06/15/11 14:51 Received: 06/17/11 08:50 Matrix: Water

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
200.8 MET ICPMS	Analytical Method: EPA 200.8 Preparation Method: EPA 200.8							
Antimony	**2.4**	ug/L	0.50	1	06/28/11 15:18	06/30/11 05:26	7440-36-0	
Arsenic	**1.2**	ug/L	0.50	1	06/28/11 15:18	06/30/11 05:26	7440-38-2	
Barium	**37.0**	ug/L	0.30	1	06/28/11 15:18	06/30/11 05:26	7440-39-3	
Cadmium	**0.12**	ug/L	0.080	1	06/28/11 15:18	06/30/11 05:26	7440-43-9	
Chromium	**0.90**	ug/L	0.50	1	06/28/11 15:18	06/30/11 05:26	7440-47-3	
Copper	**13.8**	ug/L	0.50	1	06/28/11 15:18	06/30/11 05:26	7440-50-8	
Iron	**338**	ug/L	50.0	1	06/28/11 15:18	06/30/11 05:26	7439-89-6	
Lead	**2.7**	ug/L	0.10	1	06/28/11 15:18	06/30/11 05:26	7439-92-1	
Manganese	**5.2**	ug/L	0.50	1	06/28/11 15:18	06/30/11 05:26	7439-96-5	
Nickel	**1.6**	ug/L	0.50	1	06/28/11 15:18	06/30/11 05:26	7440-02-0	
Silver	**<0.50**	ug/L	0.50	1	06/28/11 15:18	06/30/11 14:07	7440-22-4	
Zinc	**9.4**	ug/L	5.0	1	06/28/11 15:18	06/30/11 05:26	7440-66-6	
2310 Acidity	Analytical Method: SM 2310							
Acidity	**21.5**	mg/L	5.0	1		06/24/11 16:00		
2540D Total Suspended Solids	Analytical Method: SM 2540D							
Total Suspended Solids	**2.0**	mg/L	1.0	1		06/20/11 10:40		
300.0 IC Anions	Analytical Method: EPA 300.0							
Sulfate	**3.3**	mg/L	1.0	1		06/24/11 03:00	14808-79-8	
2320B Alkalinity	Analytical Method: SM 2320B							
Alkalinity, Total as CaCO3	**7.3**	mg/L	5.0	1		06/20/11 12:33		
2540C Total Dissolved Solids	Analytical Method: SM 2540C							
Total Dissolved Solids	**63.0**	mg/L	10.0	1		06/20/11 11:31		

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ANALYTICAL RESULTS

Project: Black Pine Mine
Pace Project No.: 10160655

Sample: CML-SW-16 **Lab ID: 10160655005** Collected: 06/15/11 14:09 Received: 06/17/11 08:50 Matrix: Water

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
200.8 MET ICPMS	Analytical Method: EPA 200.8 Preparation Method: EPA 200.8							
Antimony	**1.6**	ug/L	0.50	1	06/28/11 15:18	06/30/11 06:06	7440-36-0	
Arsenic	**1.2**	ug/L	0.50	1	06/28/11 15:18	06/30/11 06:06	7440-38-2	
Barium	**42.8**	ug/L	0.30	1	06/28/11 15:18	06/30/11 06:06	7440-39-3	
Cadmium	**0.11**	ug/L	0.080	1	06/28/11 15:18	06/30/11 06:06	7440-43-9	
Chromium	**0.78**	ug/L	0.50	1	06/28/11 15:18	06/30/11 06:06	7440-47-3	
Copper	**11.8**	ug/L	0.50	1	06/28/11 15:18	06/30/11 06:06	7440-50-8	
Iron	**356**	ug/L	50.0	1	06/28/11 15:18	06/30/11 06:06	7439-89-6	
Lead	**5.1**	ug/L	0.10	1	06/28/11 15:18	06/30/11 06:06	7439-92-1	
Manganese	**5.5**	ug/L	0.50	1	06/28/11 15:18	06/30/11 06:06	7439-96-5	
Nickel	**0.72**	ug/L	0.50	1	06/28/11 15:18	06/30/11 06:06	7440-02-0	
Silver	**<0.50**	ug/L	0.50	1	06/28/11 15:18	06/30/11 14:10	7440-22-4	
Zinc	**6.1**	ug/L	5.0	1	06/28/11 15:18	06/30/11 06:06	7440-66-6	
2310 Acidity	Analytical Method: SM 2310							
Acidity	**8.2**	mg/L	5.0	1		06/24/11 16:00		
2540D Total Suspended Solids	Analytical Method: SM 2540D							
Total Suspended Solids	**<2.0**	mg/L	2.0	1		06/20/11 10:40		
300.0 IC Anions	Analytical Method: EPA 300.0							
Sulfate	**2.8**	mg/L	1.0	1		06/24/11 03:28	14808-79-8	
2320B Alkalinity	Analytical Method: SM 2320B							
Alkalinity, Total as CaCO3	**8.0**	mg/L	5.0	1		06/20/11 12:37		
2540C Total Dissolved Solids	Analytical Method: SM 2540C							
Total Dissolved Solids	**34.0**	mg/L	10.0	1		06/22/11 11:27		

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ANALYTICAL RESULTS

Project: Black Pine Mine
Pace Project No.: 10160655

Sample: CML-SW-15 **Lab ID: 10160655006** Collected: 06/15/11 13:35 Received: 06/17/11 08:50 Matrix: Water

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
200.8 MET ICPMS	Analytical Method: EPA 200.8 Preparation Method: EPA 200.8							
Antimony	**<0.50**	ug/L	0.50	1	06/28/11 15:18	06/30/11 06:10	7440-36-0	
Arsenic	**0.68**	ug/L	0.50	1	06/28/11 15:18	06/30/11 06:10	7440-38-2	
Barium	**42.5**	ug/L	0.30	1	06/28/11 15:18	06/30/11 06:10	7440-39-3	
Cadmium	**<0.080**	ug/L	0.080	1	06/28/11 15:18	06/30/11 06:10	7440-43-9	
Chromium	**0.64**	ug/L	0.50	1	06/28/11 15:18	06/30/11 06:10	7440-47-3	
Copper	**5.8**	ug/L	0.50	1	06/28/11 15:18	06/30/11 06:10	7440-50-8	
Iron	**321**	ug/L	50.0	1	06/28/11 15:18	06/30/11 06:10	7439-89-6	
Lead	**0.61**	ug/L	0.10	1	06/28/11 15:18	06/30/11 06:10	7439-92-1	
Manganese	**5.6**	ug/L	0.50	1	06/28/11 15:18	06/30/11 06:10	7439-96-5	
Nickel	**0.62**	ug/L	0.50	1	06/28/11 15:18	06/30/11 06:10	7440-02-0	
Silver	**<0.50**	ug/L	0.50	1	06/28/11 15:18	06/30/11 14:14	7440-22-4	
Total Hardness by 2340B	**8260**	ug/L	71.0	1	06/28/11 15:18	06/30/11 06:10		
Zinc	**<5.0**	ug/L	5.0	1	06/28/11 15:18	06/30/11 06:10	7440-66-6	
2310 Acidity	Analytical Method: SM 2310							
Acidity	**12.0**	mg/L	5.0	1		06/24/11 16:00		
2540D Total Suspended Solids	Analytical Method: SM 2540D							
Total Suspended Solids	**2.1**	mg/L	1.0	1		06/20/11 10:40		
300.0 IC Anions	Analytical Method: EPA 300.0							
Sulfate	**3.0**	mg/L	1.0	1		06/24/11 03:57	14808-79-8	
2320B Alkalinity	Analytical Method: SM 2320B							
Alkalinity, Total as CaCO3	**8.3**	mg/L	5.0	1		06/20/11 12:40		
2540C Total Dissolved Solids	Analytical Method: SM 2540C							
Total Dissolved Solids	**34.0**	mg/L	10.0	1		06/22/11 11:27		

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ANALYTICAL RESULTS

Project: Black Pine Mine
Pace Project No.: 10160655

Sample: CML-Q1-T1 **Lab ID: 10160655007** Collected: 06/15/11 13:39 Received: 06/17/11 08:50 Matrix: Water

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
200.8 MET ICPMS	Analytical Method: EPA 200.8 Preparation Method: EPA 200.8							
Antimony	**<0.50**	ug/L	0.50	1	06/28/11 15:18	06/30/11 06:15	7440-36-0	
Arsenic	**0.65**	ug/L	0.50	1	06/28/11 15:18	06/30/11 06:15	7440-38-2	
Barium	**43.4**	ug/L	0.30	1	06/28/11 15:18	06/30/11 06:15	7440-39-3	
Cadmium	**<0.080**	ug/L	0.080	1	06/28/11 15:18	06/30/11 06:15	7440-43-9	
Chromium	**0.79**	ug/L	0.50	1	06/28/11 15:18	06/30/11 06:15	7440-47-3	
Copper	**6.0**	ug/L	0.50	1	06/28/11 15:18	06/30/11 06:15	7440-50-8	
Iron	**340**	ug/L	50.0	1	06/28/11 15:18	06/30/11 06:15	7439-89-6	
Lead	**0.63**	ug/L	0.10	1	06/28/11 15:18	06/30/11 06:15	7439-92-1	
Manganese	**5.8**	ug/L	0.50	1	06/28/11 15:18	06/30/11 06:15	7439-96-5	
Nickel	**0.75**	ug/L	0.50	1	06/28/11 15:18	06/30/11 06:15	7440-02-0	
Silver	**<0.50**	ug/L	0.50	1	06/28/11 15:18	06/30/11 14:38	7440-22-4	
Zinc	**5.2**	ug/L	5.0	1	06/28/11 15:18	06/30/11 06:15	7440-66-6	

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ANALYTICAL RESULTS

Project: Black Pine Mine
Pace Project No.: 10160655

Sample: CML-SW-04 **Lab ID: 10160655008** Collected: 06/15/11 13:20 Received: 06/17/11 08:50 Matrix: Water

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
200.8 MET ICPMS	Analytical Method: EPA 200.8 Preparation Method: EPA 200.8							
Antimony	**<0.50**	ug/L	0.50	1	06/28/11 15:18	06/30/11 06:19	7440-36-0	
Arsenic	**0.53**	ug/L	0.50	1	06/28/11 15:18	06/30/11 06:19	7440-38-2	
Barium	**41.1**	ug/L	0.30	1	06/28/11 15:18	06/30/11 06:19	7440-39-3	
Cadmium	**<0.080**	ug/L	0.080	1	06/28/11 15:18	06/30/11 06:19	7440-43-9	
Chromium	**0.62**	ug/L	0.50	1	06/28/11 15:18	06/30/11 06:19	7440-47-3	
Copper	**3.8**	ug/L	0.50	1	06/28/11 15:18	06/30/11 06:19	7440-50-8	
Iron	**288**	ug/L	50.0	1	06/28/11 15:18	06/30/11 06:19	7439-89-6	
Lead	**0.31**	ug/L	0.10	1	06/28/11 15:18	06/30/11 06:19	7439-92-1	
Manganese	**4.7**	ug/L	0.50	1	06/28/11 15:18	06/30/11 06:19	7439-96-5	
Nickel	**0.54**	ug/L	0.50	1	06/28/11 15:18	06/30/11 06:19	7440-02-0	
Silver	**<0.50**	ug/L	0.50	1	06/28/11 15:18	06/30/11 14:41	7440-22-4	
Zinc	**<5.0**	ug/L	5.0	1	06/28/11 15:18	06/30/11 06:19	7440-66-6	
2310 Acidity	Analytical Method: SM 2310							
Acidity	**10.1**	mg/L	5.0	1		06/24/11 16:00		
2540D Total Suspended Solids	Analytical Method: SM 2540D							
Total Suspended Solids	**1.5**	mg/L	1.0	1		06/20/11 10:40		
300.0 IC Anions	Analytical Method: EPA 300.0							
Sulfate	**2.6**	mg/L	1.0	1		06/24/11 04:25	14808-79-8	
2320B Alkalinity	Analytical Method: SM 2320B							
Alkalinity, Total as CaCO3	**7.8**	mg/L	5.0	1		06/20/11 12:52		
2540C Total Dissolved Solids	Analytical Method: SM 2540C							
Total Dissolved Solids	**29.0**	mg/L	10.0	1		06/22/11 11:28		

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ANALYTICAL RESULTS

Project: Black Pine Mine
Pace Project No.: 10160655

Sample: CML-SW-13 **Lab ID: 10160655009** Collected: 06/15/11 12:39 Received: 06/17/11 08:50 Matrix: Water

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
200.8 MET ICPMS	Analytical Method: EPA 200.8 Preparation Method: EPA 200.8							
Antimony	**<0.50**	ug/L	0.50	1	06/28/11 15:18	06/30/11 06:23	7440-36-0	
Arsenic	**<0.50**	ug/L	0.50	1	06/28/11 15:18	06/30/11 06:23	7440-38-2	
Barium	**40.3**	ug/L	0.30	1	06/28/11 15:18	06/30/11 06:23	7440-39-3	
Cadmium	**<0.080**	ug/L	0.080	1	06/28/11 15:18	06/30/11 06:23	7440-43-9	
Chromium	**0.54**	ug/L	0.50	1	06/28/11 15:18	06/30/11 06:23	7440-47-3	
Copper	**2.1**	ug/L	0.50	1	06/28/11 15:18	06/30/11 06:23	7440-50-8	
Iron	**168**	ug/L	50.0	1	06/28/11 15:18	06/30/11 06:23	7439-89-6	
Lead	**0.18**	ug/L	0.10	1	06/28/11 15:18	06/30/11 06:23	7439-92-1	
Manganese	**3.4**	ug/L	0.50	1	06/28/11 15:18	06/30/11 06:23	7439-96-5	
Nickel	**0.77**	ug/L	0.50	1	06/28/11 15:18	06/30/11 06:23	7440-02-0	
Silver	**<0.50**	ug/L	0.50	1	06/28/11 15:18	06/30/11 14:45	7440-22-4	
Zinc	**6.8**	ug/L	5.0	1	06/28/11 15:18	06/30/11 06:23	7440-66-6	
2310 Acidity	Analytical Method: SM 2310							
Acidity	**<5.0**	mg/L	5.0	1		06/24/11 16:00		
2540D Total Suspended Solids	Analytical Method: SM 2540D							
Total Suspended Solids	**1.1**	mg/L	1.0	1		06/20/11 10:40		
300.0 IC Anions	Analytical Method: EPA 300.0							
Sulfate	**2.0**	mg/L	1.0	1		06/24/11 04:54	14808-79-8	
2320B Alkalinity	Analytical Method: SM 2320B							
Alkalinity, Total as CaCO3	**7.6**	mg/L	5.0	1		06/20/11 12:55		
2540C Total Dissolved Solids	Analytical Method: SM 2540C							
Total Dissolved Solids	**26.0**	mg/L	10.0	1		06/22/11 11:29		

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ANALYTICAL RESULTS

Project: Black Pine Mine
Pace Project No.: 10160655

Sample: CML-SW-05 **Lab ID: 10160655010** Collected: 06/15/11 12:35 Received: 06/17/11 08:50 Matrix: Water

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
200.8 MET ICPMS	Analytical Method: EPA 200.8 Preparation Method: EPA 200.8							
Antimony	**<0.50**	ug/L	0.50	1	06/28/11 15:18	06/30/11 06:28	7440-36-0	
Arsenic	**<0.50**	ug/L	0.50	1	06/28/11 15:18	06/30/11 06:28	7440-38-2	
Barium	**39.6**	ug/L	0.30	1	06/28/11 15:18	06/30/11 06:28	7440-39-3	
Cadmium	**<0.080**	ug/L	0.080	1	06/28/11 15:18	06/30/11 06:28	7440-43-9	
Chromium	**<0.50**	ug/L	0.50	1	06/28/11 15:18	06/30/11 06:28	7440-47-3	
Copper	**1.0**	ug/L	0.50	1	06/28/11 15:18	06/30/11 06:28	7440-50-8	
Iron	**162**	ug/L	50.0	1	06/28/11 15:18	06/30/11 06:28	7439-89-6	
Lead	**0.12**	ug/L	0.10	1	06/28/11 15:18	06/30/11 06:28	7439-92-1	
Manganese	**2.5**	ug/L	0.50	1	06/28/11 15:18	06/30/11 06:28	7439-96-5	
Nickel	**<0.50**	ug/L	0.50	1	06/28/11 15:18	06/30/11 06:28	7440-02-0	
Silver	**<0.50**	ug/L	0.50	1	06/28/11 15:18	06/30/11 14:48	7440-22-4	
Total Hardness by 2340B	**6630**	ug/L	71.0	1	06/28/11 15:18	06/30/11 06:28		
Zinc	**<5.0**	ug/L	5.0	1	06/28/11 15:18	06/30/11 06:28	7440-66-6	
2310 Acidity	Analytical Method: SM 2310							
Acidity	**20.5**	mg/L	5.0	1		06/24/11 16:00		
2540D Total Suspended Solids	Analytical Method: SM 2540D							
Total Suspended Solids	**1.4**	mg/L	1.1	1		06/20/11 10:40		
300.0 IC Anions	Analytical Method: EPA 300.0							
Sulfate	**2.0**	mg/L	1.0	1		06/24/11 05:22	14808-79-8	
2320B Alkalinity	Analytical Method: SM 2320B							
Alkalinity, Total as CaCO3	**7.2**	mg/L	5.0	1		06/20/11 12:58		
2540C Total Dissolved Solids	Analytical Method: SM 2540C							
Total Dissolved Solids	**24.0**	mg/L	10.0	1		06/22/11 11:29		

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ANALYTICAL RESULTS

Project: Black Pine Mine
Pace Project No.: 10160655

Sample: CML-SW-11 **Lab ID: 10160655011** Collected: 06/15/11 14:16 Received: 06/17/11 08:50 Matrix: Water

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
200.8 MET ICPMS	Analytical Method: EPA 200.8 Preparation Method: EPA 200.8							
Antimony	**1.7**	ug/L	0.50	1	06/28/11 15:18	06/30/11 06:32	7440-36-0	
Arsenic	**0.90**	ug/L	0.50	1	06/28/11 15:18	06/30/11 06:32	7440-38-2	
Barium	**42.0**	ug/L	0.30	1	06/28/11 15:18	06/30/11 06:32	7440-39-3	
Cadmium	**0.090**	ug/L	0.080	1	06/28/11 15:18	06/30/11 06:32	7440-43-9	
Chromium	**0.75**	ug/L	0.50	1	06/28/11 15:18	06/30/11 06:32	7440-47-3	
Copper	**11.6**	ug/L	0.50	1	06/28/11 15:18	06/30/11 06:32	7440-50-8	
Iron	**400**	ug/L	50.0	1	06/28/11 15:18	06/30/11 06:32	7439-89-6	
Lead	**1.7**	ug/L	0.10	1	06/28/11 15:18	06/30/11 06:32	7439-92-1	
Manganese	**5.8**	ug/L	0.50	1	06/28/11 15:18	06/30/11 06:32	7439-96-5	
Nickel	**0.77**	ug/L	0.50	1	06/28/11 15:18	06/30/11 06:32	7440-02-0	
Silver	**<0.50**	ug/L	0.50	1	06/28/11 15:18	06/30/11 14:51	7440-22-4	
Zinc	**7.2**	ug/L	5.0	1	06/28/11 15:18	06/30/11 06:32	7440-66-6	
2310 Acidity	Analytical Method: SM 2310							
Acidity	**7.3**	mg/L	5.0	1		06/24/11 16:00		
2540D Total Suspended Solids	Analytical Method: SM 2540D							
Total Suspended Solids	**1.8**	mg/L	1.0	1		06/20/11 10:40		
300.0 IC Anions	Analytical Method: EPA 300.0							
Sulfate	**2.9**	mg/L	1.0	1		06/24/11 05:51	14808-79-8	
2320B Alkalinity	Analytical Method: SM 2320B							
Alkalinity, Total as CaCO3	**9.2**	mg/L	5.0	1		06/20/11 13:02		
2540C Total Dissolved Solids	Analytical Method: SM 2540C							
Total Dissolved Solids	**36.0**	mg/L	10.0	1		06/22/11 11:30		

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QUALITY CONTROL DATA

Project: Black Pine Mine
Pace Project No.: 10160655

QC Batch: MPRP/26726 Analysis Method: EPA 200.8
QC Batch Method: EPA 200.8 Analysis Description: 200.8 MET
Associated Lab Samples: 10160655001, 10160655002, 10160655003, 10160655004, 10160655005, 10160655006, 10160655007, 10160655008, 10160655009, 10160655010, 10160655011

METHOD BLANK: 998290 Matrix: Water
Associated Lab Samples: 10160655001, 10160655002, 10160655003, 10160655004, 10160655005, 10160655006, 10160655007, 10160655008, 10160655009, 10160655010, 10160655011

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Antimony	ug/L	<0.50	0.50	06/30/11 06:01	
Arsenic	ug/L	<0.50	0.50	06/30/11 06:01	
Barium	ug/L	<0.30	0.30	06/30/11 06:01	
Cadmium	ug/L	<0.080	0.080	06/30/11 06:01	
Chromium	ug/L	<0.50	0.50	06/30/11 06:01	
Copper	ug/L	<0.50	0.50	06/30/11 06:01	
Iron	ug/L	<50.0	50.0	06/30/11 06:01	
Lead	ug/L	<0.10	0.10	06/30/11 06:01	
Manganese	ug/L	<0.50	0.50	06/30/11 06:01	
Nickel	ug/L	<0.50	0.50	06/30/11 06:01	
Silver	ug/L	<0.50	0.50	06/30/11 06:01	
Zinc	ug/L	<5.0	5.0	06/30/11 06:01	

LABORATORY CONTROL SAMPLE: 998291

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Antimony	ug/L	80	79.8	100	85-115	
Arsenic	ug/L	80	82.4	103	85-115	
Barium	ug/L	80	81.9	102	85-115	
Cadmium	ug/L	80	81.5	102	85-115	
Chromium	ug/L	80	81.8	102	85-115	
Copper	ug/L	80	85.5	107	85-115	
Iron	ug/L	1000	1020	102	85-115	
Lead	ug/L	80	81.7	102	85-115	
Manganese	ug/L	80	82.0	102	85-115	
Nickel	ug/L	80	79.6	99	85-115	
Silver	ug/L	80	86.3	108	85-115	
Zinc	ug/L	80	77.7	97	85-115	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 998292 998293

Parameter	Units	10160655001 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Antimony	ug/L	42.9	80	80	125	128	103	106	70-130	2	20	
Arsenic	ug/L	12.8	80	80	95.3	95.4	103	103	70-130	.1	20	
Barium	ug/L	81.7	80	80	170	170	111	110	70-130	.5	20	
Cadmium	ug/L	1.2	80	80	84.3	82.5	104	102	70-130	2	20	
Chromium	ug/L	1.3	80	80	85.1	84.1	105	104	70-130	1	20	

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QUALITY CONTROL DATA

Project: Black Pine Mine
Pace Project No.: 10160655

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 998292 998293

Parameter	Units	10160655001 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Copper	ug/L	221	80	80	314	311	116	114	70-130	.7	20	
Iron	ug/L	1430	1000	1000	2810	2900	138	147	70-130	3	20	M1
Lead	ug/L	49.0	80	80	133	134	104	106	70-130	.8	20	
Manganese	ug/L	12.9	80	80	96.2	96.9	104	105	70-130	.7	20	
Nickel	ug/L	2.1	80	80	81.6	81.0	99	99	70-130	.8	20	
Silver	ug/L	0.64	80	80	80.9	84.1	100	104	70-130	4	20	
Zinc	ug/L	40.5	80	80	122	120	101	99	70-130	2	20	

MATRIX SPIKE SAMPLE: 998294

Parameter	Units	10160673004 Result	Spike Conc.	MS Result	MS % Rec	% Rec Limits	Qualifiers
Antimony	ug/L	0.53	80	78.9	98	70-130	
Arsenic	ug/L	1.1	80	82.3	101	70-130	
Barium	ug/L	85.4	80	169	104	70-130	
Cadmium	ug/L	<0.080	80	80.3	100	70-130	
Chromium	ug/L	1.3	80	83.0	102	70-130	
Copper	ug/L	22.5	80	106	104	70-130	
Iron	ug/L	1000	1000	2310	131	70-130	M1
Lead	ug/L	0.97	80	81.2	100	70-130	
Manganese	ug/L	8.9	80	89.0	100	70-130	
Nickel	ug/L	2.2	80	79.7	97	70-130	
Silver	ug/L	<0.50	80	78.7	98	70-130	
Zinc	ug/L	8.2	80	85.9	97	70-130	

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QUALITY CONTROL DATA

Project: Black Pine Mine
Pace Project No.: 10160655

QC Batch: MT/6228 Analysis Method: SM 2310
QC Batch Method: SM 2310 Analysis Description: 2310 Acidity
Associated Lab Samples: 10160655001, 10160655002, 10160655003, 10160655004, 10160655005, 10160655006, 10160655008, 10160655009, 10160655010, 10160655011

METHOD BLANK: 1000993 Matrix: Water
Associated Lab Samples: 10160655001, 10160655002, 10160655003, 10160655004, 10160655005, 10160655006, 10160655008, 10160655009, 10160655010, 10160655011

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Acidity	mg/L	<5.0	5.0	06/24/11 16:00	

SAMPLE DUPLICATE: 1000995

Parameter	Units	10160655003 Result	Dup Result	RPD	Max RPD	Qualifiers
Acidity	mg/L	16.7	16.7	0	20	

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QUALITY CONTROL DATA

Project: Black Pine Mine
Pace Project No.: 10160655

QC Batch: MT/6192 Analysis Method: SM 2540D
QC Batch Method: SM 2540D Analysis Description: 2540D Total Suspended Solids
Associated Lab Samples: 10160655001, 10160655002, 10160655003, 10160655004, 10160655005, 10160655006, 10160655008, 10160655009, 10160655010, 10160655011

METHOD BLANK: 998564 Matrix: Water
Associated Lab Samples: 10160655001, 10160655002, 10160655003, 10160655004, 10160655005, 10160655006, 10160655008, 10160655009, 10160655010, 10160655011

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Total Suspended Solids	mg/L	<1.0	1.0	06/20/11 10:40	

LABORATORY CONTROL SAMPLE: 998563

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Total Suspended Solids	mg/L	25	25.0	100	71-129	

SAMPLE DUPLICATE: 998919

Parameter	Units	10160673006 Result	Dup Result	RPD	Max RPD	Qualifiers
Total Suspended Solids	mg/L	<2.0	<2.0		20	

SAMPLE DUPLICATE: 998920

Parameter	Units	10160655005 Result	Dup Result	RPD	Max RPD	Qualifiers
Total Suspended Solids	mg/L	<2.0	2.2		20	

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QUALITY CONTROL DATA

Project: Black Pine Mine
Pace Project No.: 10160655

QC Batch: MT/6195 Analysis Method: EPA 300.0
QC Batch Method: EPA 300.0 Analysis Description: 300.0 IC Anions
Associated Lab Samples: 10160655001, 10160655002, 10160655003, 10160655004, 10160655005, 10160655006, 10160655008, 10160655009, 10160655010, 10160655011

METHOD BLANK: 998638 Matrix: Water
Associated Lab Samples: 10160655001, 10160655002, 10160655003, 10160655004, 10160655005, 10160655006, 10160655008, 10160655009, 10160655010, 10160655011

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Sulfate	mg/L	<1.0	1.0	06/23/11 22:15	

LABORATORY CONTROL SAMPLE: 998639

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Sulfate	mg/L	20	19.5	98	90-110	

MATRIX SPIKE SAMPLE: 998640

Parameter	Units	10160067001 Result	Spike Conc.	MS Result	MS % Rec	% Rec Limits	Qualifiers
Sulfate	mg/L	12.5	20	32.2	99	80-120	

MATRIX SPIKE SAMPLE: 998642

Parameter	Units	10160709001 Result	Spike Conc.	MS Result	MS % Rec	% Rec Limits	Qualifiers
Sulfate	mg/L	4110	4000	8170	101	80-120	

SAMPLE DUPLICATE: 998641

Parameter	Units	10160067002 Result	Dup Result	RPD	Max RPD	Qualifiers
Sulfate	mg/L	14.1	18.4	26	20	D6

SAMPLE DUPLICATE: 998643

Parameter	Units	10160709002 Result	Dup Result	RPD	Max RPD	Qualifiers
Sulfate	mg/L	5330	5370	.6	20	

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QUALITY CONTROL DATA

Project: Black Pine Mine
Pace Project No.: 10160655

QC Batch: WET/22674 Analysis Method: SM 2320B
QC Batch Method: SM 2320B Analysis Description: 2320B Alkalinity
Associated Lab Samples: 10160655001, 10160655002, 10160655003, 10160655004, 10160655005, 10160655006, 10160655008, 10160655009, 10160655010, 10160655011

METHOD BLANK: 998338 Matrix: Water
Associated Lab Samples: 10160655001, 10160655002, 10160655003, 10160655004, 10160655005, 10160655006, 10160655008, 10160655009, 10160655010, 10160655011

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Alkalinity, Total as CaCO3	mg/L	<5.0	5.0	06/20/11 11:16	

LABORATORY CONTROL SAMPLE & LCSD: 998339 998340

Parameter	Units	Spike Conc.	LCS Result	LCSD Result	LCS % Rec	LCSD % Rec	% Rec Limits	RPD	Max RPD	Qualifiers
Alkalinity, Total as CaCO3	mg/L	40	39.0	39.7	98	99	90-110	2	30	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 998341 998342

Parameter	Units	10160707001 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Alkalinity, Total as CaCO3	mg/L	13.4	40	40	53.2	53.8	99	101	80-120	1	30	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 998343 998344

Parameter	Units	10160722002 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Alkalinity, Total as CaCO3	mg/L	232	40	40	281	283	124	127	80-120	.4	30	M1

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QUALITY CONTROL DATA

Project: Black Pine Mine
Pace Project No.: 10160655

QC Batch: WET/22678 Analysis Method: SM 2540C
QC Batch Method: SM 2540C Analysis Description: 2540C Total Dissolved Solids
Associated Lab Samples: 10160655001, 10160655002, 10160655003, 10160655004

METHOD BLANK: 998440 Matrix: Water
Associated Lab Samples: 10160655001, 10160655002, 10160655003, 10160655004

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Total Dissolved Solids	mg/L	<10.0	10.0	06/20/11 12:01	

LABORATORY CONTROL SAMPLE: 998441

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Total Dissolved Solids	mg/L	1000	982	98	80-120	

SAMPLE DUPLICATE: 998442

Parameter	Units	10160707001 Result	Dup Result	RPD	Max RPD	Qualifiers
Total Dissolved Solids	mg/L	125	115	8	20	

SAMPLE DUPLICATE: 998443

Parameter	Units	10160655002 Result	Dup Result	RPD	Max RPD	Qualifiers
Total Dissolved Solids	mg/L	103	94.0	9	20	

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QUALITY CONTROL DATA

Project: Black Pine Mine
Pace Project No.: 10160655

QC Batch: WET/22692 Analysis Method: SM 2540C
QC Batch Method: SM 2540C Analysis Description: 2540C Total Dissolved Solids
Associated Lab Samples: 10160655005, 10160655006, 10160655008, 10160655009, 10160655010, 10160655011

METHOD BLANK: 999964 Matrix: Water
Associated Lab Samples: 10160655005, 10160655006, 10160655008, 10160655009, 10160655010, 10160655011

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Total Dissolved Solids	mg/L	<10.0	10.0	06/22/11 11:26	

LABORATORY CONTROL SAMPLE: 999965

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Total Dissolved Solids	mg/L	1000	998	100	80-120	

SAMPLE DUPLICATE: 999966

Parameter	Units	10160655005 Result	Dup Result	RPD	Max RPD	Qualifiers
Total Dissolved Solids	mg/L	34.0	29.0	16	20	

SAMPLE DUPLICATE: 999967

Parameter	Units	10160655006 Result	Dup Result	RPD	Max RPD	Qualifiers
Total Dissolved Solids	mg/L	34.0	32.0	6	20	

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QUALIFIERS

Project: Black Pine Mine
Pace Project No.: 10160655

DEFINITIONS

DF - Dilution Factor, if reported, represents the factor applied to the reported data due to changes in sample preparation, dilution of the sample aliquot, or moisture content.

ND - Not Detected at or above adjusted reporting limit.

J - Estimated concentration above the adjusted method detection limit and below the adjusted reporting limit.

MDL - Adjusted Method Detection Limit.

S - Surrogate

1,2-Diphenylhydrazine (8270 listed analyte) decomposes to Azobenzene.

Consistent with EPA guidelines, unrounded data are displayed and have been used to calculate % recovery and RPD values.

LCS(D) - Laboratory Control Sample (Duplicate)

MS(D) - Matrix Spike (Duplicate)

DUP - Sample Duplicate

RPD - Relative Percent Difference

NC - Not Calculable.

SG - Silica Gel - Clean-Up

U - Indicates the compound was analyzed for, but not detected.

N-Nitrosodiphenylamine decomposes and cannot be separated from Diphenylamine using Method 8270. The result reported for each analyte is a combined concentration.

LABORATORIES

PASI-M	Pace Analytical Services - Minneapolis
PASI-MT	Pace Analytical Services - Montana

ANALYTE QUALIFIERS

D6	The relative percent difference (RPD) between the sample and sample duplicate exceeded laboratory control limits.
M1	Matrix spike recovery exceeded QC limits. Batch accepted based on laboratory control sample (LCS) recovery.

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QUALITY CONTROL DATA CROSS REFERENCE TABLE

Project: Black Pine Mine
Pace Project No.: 10160655

Lab ID	Sample ID	QC Batch Method	QC Batch	Analytical Method	Analytical Batch
10160655001	**CML-SW-07**	EPA 200.8	MPRP/26726	EPA 200.8	ICPM/10928
10160655002	**CML-SW-03**	EPA 200.8	MPRP/26726	EPA 200.8	ICPM/10928
10160655003	**CML-SW-08**	EPA 200.8	MPRP/26726	EPA 200.8	ICPM/10928
10160655004	**CML-SW-10**	EPA 200.8	MPRP/26726	EPA 200.8	ICPM/10928
10160655005	**CML-SW-16**	EPA 200.8	MPRP/26726	EPA 200.8	ICPM/10928
10160655006	**CML-SW-15**	EPA 200.8	MPRP/26726	EPA 200.8	ICPM/10928
10160655007	**CML-Q1-T1**	EPA 200.8	MPRP/26726	EPA 200.8	ICPM/10928
10160655008	**CML-SW-04**	EPA 200.8	MPRP/26726	EPA 200.8	ICPM/10928
10160655009	**CML-SW-13**	EPA 200.8	MPRP/26726	EPA 200.8	ICPM/10928
10160655010	**CML-SW-05**	EPA 200.8	MPRP/26726	EPA 200.8	ICPM/10928
10160655011	**CML-SW-11**	EPA 200.8	MPRP/26726	EPA 200.8	ICPM/10928
10160655001	**CML-SW-07**	SM 2310	MT/6228		
10160655002	**CML-SW-03**	SM 2310	MT/6228		
10160655003	**CML-SW-08**	SM 2310	MT/6228		
10160655004	**CML-SW-10**	SM 2310	MT/6228		
10160655005	**CML-SW-16**	SM 2310	MT/6228		
10160655006	**CML-SW-15**	SM 2310	MT/6228		
10160655008	**CML-SW-04**	SM 2310	MT/6228		
10160655009	**CML-SW-13**	SM 2310	MT/6228		
10160655010	**CML-SW-05**	SM 2310	MT/6228		
10160655011	**CML-SW-11**	SM 2310	MT/6228		
10160655001	**CML-SW-07**	SM 2540D	MT/6192		
10160655002	**CML-SW-03**	SM 2540D	MT/6192		
10160655003	**CML-SW-08**	SM 2540D	MT/6192		
10160655004	**CML-SW-10**	SM 2540D	MT/6192		
10160655005	**CML-SW-16**	SM 2540D	MT/6192		
10160655006	**CML-SW-15**	SM 2540D	MT/6192		
10160655008	**CML-SW-04**	SM 2540D	MT/6192		
10160655009	**CML-SW-13**	SM 2540D	MT/6192		
10160655010	**CML-SW-05**	SM 2540D	MT/6192		
10160655011	**CML-SW-11**	SM 2540D	MT/6192		
10160655001	**CML-SW-07**	EPA 300.0	MT/6195		
10160655002	**CML-SW-03**	EPA 300.0	MT/6195		
10160655003	**CML-SW-08**	EPA 300.0	MT/6195		
10160655004	**CML-SW-10**	EPA 300.0	MT/6195		
10160655005	**CML-SW-16**	EPA 300.0	MT/6195		
10160655006	**CML-SW-15**	EPA 300.0	MT/6195		
10160655008	**CML-SW-04**	EPA 300.0	MT/6195		
10160655009	**CML-SW-13**	EPA 300.0	MT/6195		
10160655010	**CML-SW-05**	EPA 300.0	MT/6195		
10160655011	**CML-SW-11**	EPA 300.0	MT/6195		
10160655001	**CML-SW-07**	SM 2320B	WET/22674		
10160655002	**CML-SW-03**	SM 2320B	WET/22674		
10160655003	**CML-SW-08**	SM 2320B	WET/22674		
10160655004	**CML-SW-10**	SM 2320B	WET/22674		
10160655005	**CML-SW-16**	SM 2320B	WET/22674		
10160655006	**CML-SW-15**	SM 2320B	WET/22674		

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QUALITY CONTROL DATA CROSS REFERENCE TABLE

Project: Black Pine Mine
Pace Project No.: 10160655

Lab ID	Sample ID	QC Batch Method	QC Batch	Analytical Method	Analytical Batch
10160655008	**CML-SW-04**	SM 2320B	WET/22674		
10160655009	**CML-SW-13**	SM 2320B	WET/22674		
10160655010	**CML-SW-05**	SM 2320B	WET/22674		
10160655011	**CML-SW-11**	SM 2320B	WET/22674		
10160655001	**CML-SW-07**	SM 2540C	WET/22678		
10160655002	**CML-SW-03**	SM 2540C	WET/22678		
10160655003	**CML-SW-08**	SM 2540C	WET/22678		
10160655004	**CML-SW-10**	SM 2540C	WET/22678		
10160655005	**CML-SW-16**	SM 2540C	WET/22692		
10160655006	**CML-SW-15**	SM 2540C	WET/22692		
10160655008	**CML-SW-04**	SM 2540C	WET/22692		
10160655009	**CML-SW-13**	SM 2540C	WET/22692		
10160655010	**CML-SW-05**	SM 2540C	WET/22692		
10160655011	**CML-SW-11**	SM 2540C	WET/22692		

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CHAIN-OF-CUSTODY / Analytical Request Document

The Chain-of-Custody is a LEGAL DOCUMENT. All relevant fields must be completed accurately.

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Section A Required Client Information:	Section B Required Project Information:	Section C Invoice Information:
Company: Herrera	Report To: Kevin Houck	Attention:
Address:	Copy To:	Company Name: DEQ
		Address:
Email To:	Purchase Order No.:	Pace Quote Reference:
Phone: Fax:	Project Name:	Pace Project Manager:
Requested Due Date/TAT:	Project Number:	Pace Profile #:

REGULATORY AGENCY

☐ NPDES ☐ GROUND WATER ☐ DRINKING WATER

☐ UST ☐ RCRA ☐ OTHER _____

Site Location STATE: _____

Requested Analysis Filtered (Y/N)

ITEM #	Section D Required Client Information — SAMPLE ID (A-Z, 0-9 / ,-) Sample IDs MUST BE UNIQUE	Matrix Codes MATRIX / CODE: Drinking Water DW; Water WT; Waste Water WW; Product P; Soil/Solid SL; Oil OL; Wipe WP; Air AR; Tissue TS; Other OT	MATRIX CODE (see valid codes to left)	SAMPLE TYPE (G=GRAB C=COMP)	COLLECTED: COMPOSITE START DATE	COMPOSITE START TIME	COMPOSITE END/GRAB DATE	COMPOSITE END/GRAB TIME	SAMPLE TEMP AT COLLECTION	# OF CONTAINERS	Preservatives: Unpreserved	H_2SO_4	HNO_3	HCl	NaOH	$Na_2S_2O_3$	Methanol	Other	Analysis Test ↓ Y/N	TSS	TDS	Alk	Acidity	Sulfate	Total Metals	Metals (solid)	Residual Chlorine (Y/N)	Pace Project No./ Lab I.D.
																				Y/N	N	N				Y	N		
1	CML-SW-07		WW	G			6/14/11	1005		4	X		X								X	X		X		X			001
2	CML-SW-03						6/15/11	0820		4	X		X								X	X		X		X			002
3	CML-SW-08						6/15/11	1520		4	X		X								X	X		X		X			003
4	CML-SW-10							1451		4	X		X								X	X		X		X			004
5	CML-SW-16							1409		4	X		X								X	X		X		X			005
6																													
7																													
8																													
9																													
10																													
11																													
12																													

ADDITIONAL COMMENTS	RELINQUISHED BY / AFFILIATION	DATE	TIME	ACCEPTED BY / AFFILIATION	DATE	TIME	SAMPLE CONDITIONS: Temp in °C	Received on Ice (Y/N)	Custody Sealed Cooler (Y/N)	Samples Intact (Y/N)
ALL "SML" on bottles should be "CML".	GJ Catena / Herrera	6/16/11	1130				24	5	5	5
	FedEx	6/17/11	0850	Dennis Price	6/17/11	0850				

ORIGINAL

SAMPLER NAME AND SIGNATURE

PRINT Name of SAMPLER: Gina Catena

SIGNATURE of SAMPLER: GJ Catena DATE Signed (MM/DD/YY): 6/16/11

*Important Note: By signing this form you are accepting Pace's NET 30 day payment terms and agreeing to late charges of 1.5% per month for any invoices not paid within 30 days.

F-ALL-Q-020rev.07, 15-May-2007

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Page: 1 of 1

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Section A Required Client Information:	Section B Required Project Information:	Section C Invoice Information:
Company: Herrera	Report To: Kevin Houck	Attention:
Address:	Copy To: "	Company Name: DEQ
		Address:
Email To:	Purchase Order No.:	Pace Quote Reference:
Phone: Fax:	Project Name:	Pace Project Manager:
Requested Due Date/TAT:	Project Number:	Pace Profile #:

REGULATORY AGENCY

☐ NPDES ☐ GROUND WATER ☐ DRINKING WATER

☐ UST ☐ RCRA ☐ OTHER _____

Site Location STATE: _____

Section D Required Client Information

SAMPLE ID
(A-Z, 0-9 / ,-)
Sample IDs MUST BE UNIQUE

Matrix Codes (MATRIX / CODE): Drinking Water DW; Water WT; Waste Water WW; Product P; Soil/Solid SL; Oil OL; Wipe WP; Air AR; Tissue TS; Other OT

Requested Analysis Filtered (Y/N)

ITEM #	SAMPLE ID	MATRIX CODE (see valid codes to left)	SAMPLE TYPE (G=GRAB C=COMP)	COLLECTED COMPOSITE START DATE	COLLECTED COMPOSITE START TIME	COLLECTED COMPOSITE END/GRAB DATE	COLLECTED COMPOSITE END/GRAB TIME	SAMPLE TEMP AT COLLECTION	# OF CONTAINERS	Preservatives: Unpreserved	H_2SO_4	HNO_3	HCl	NaOH	$Na_2S_2O_3$	Methanol	Other	Analysis Test Y/N: TSS	TDS	Alk	Acidity	Total Metals	Metals (solid)	Residual Chlorine (Y/N)	Pace Project No./ Lab I.D.
1	CML-SW-15	W	G			6/15/11	1335		4	X		X						X	X	X	X				1016655 006
2	CML-Q1-T1						1399		1			X									X					007
3	CML-SW-04						1320		4	X		X						X	X	X	X					008
4	CML-SW-13						1239		4	X		X						X	X	X	X					009
5	CML-SW-05						1235		4	X		X						X	X	X	X					010
6	CML-SW-11						1416		4	X		X						X	X	X	X					011
7																										
8																										
9																										
10																										
11																										
12																										

ADDITIONAL COMMENTS	RELINQUISHED BY / AFFILIATION	DATE	TIME	ACCEPTED BY / AFFILIATION	DATE	TIME	SAMPLE CONDITIONS			
All "SML" on bottles should be "CML"	KD Cate / Herrera	6/16/11	1130				40	Y	Y	Y
	Fed Ex	6/17/11	0850	Jennifer Pace	6/17/11	0850				

ORIGINAL

SAMPLER NAME AND SIGNATURE

PRINT Name of SAMPLER: Gina Catarra

SIGNATURE of SAMPLER: KD Cate DATE Signed (MM/DD/YY): 6/16/11

Temp in °C | Received on Ice (Y/N) | Custody Sealed Cooler (Y/N) | Samples Intact (Y/N)

*Important Note: By signing this form you are accepting Pace's NET 30 day payment terms and agreeing to late charges of 1.5% per month for any invoices not paid within 30 days.

F-ALL-Q-020rev.07, 15-May-2007

Sample Condition Upon Receipt

Pace Analytical

Client Name: Herren Env Project # 10160655

Courier: ☒ Fed Ex ☐ UPS ☐ USPS ☐ Client ☐ Commercial ☐ Pace Other _____

Tracking #: 879718460097295

[redacted]

Custody Seal on Cooler/Box Present: ☑ yes ☐ no Seals intact: ☑ yes ☐ no

Packing Material: ☐ Bubble Wrap ☐ Bubble Bags ☑ None ☐ Other _____ Temp Blank: Yes ✓ No _____

Thermometer Used 1383045 or 135 **Type of Ice:** (Wet) Blue None ☐ Samples on ice, cooling process has begun

Cooler Temperature 4.0 2.4 **Biological Tissue is Frozen:** Yes No

Temp should be above freezing to 6°C

Date and Initials of person examining contents: 6/18/11 M

Comments:

Chain of Custody Present:	☑Yes ☐No ☐N/A	1.
Chain of Custody Filled Out:	☑Yes ☐No ☐N/A	2.
Chain of Custody Relinquished:	☑Yes ☐No ☐N/A	3.
Sampler Name & Signature on COC:	☑Yes ☐No ☐N/A	4.
Samples Arrived within Hold Time:	☑Yes ☐No ☐N/A	5.
Short Hold Time Analysis (<72hr):	☐Yes ☑No ☐N/A	6.
Rush Turn Around Time Requested:	☐Yes ☑No ☐N/A	7.
Sufficient Volume:	☑Yes ☐No ☐N/A	8.
Correct Containers Used:	☑Yes ☐No ☐N/A	9.
-Pace Containers Used:	☑Yes ☐No ☐N/A	
Containers Intact:	☑Yes ☐No ☐N/A	10.
Filtered volume received for Dissolved tests	☐Yes ☐No ☑N/A	11.
Sample Labels match COC:	☑Yes ☐No ☐N/A	12.
-Includes date/time/ID/Analysis Matrix: WW		
All containers needing acid/base preservation have been checked. Noncompliance are noted in 13.	☑Yes ☐No ☐N/A	13. ☑ HNO3 ☐ H2SO4 ☐ NaOH ☐ HCl
All containers needing preservation are found to be in compliance with EPA recommendation.	☑Yes ☐No ☐N/A	Samp # 6of6 11of11 MB 6/17/11
Exceptions: VOA,Coliform, TOC, Oil and Grease, WI-DRO (water)	☐Yes ☑No	Initial when completed / Lot # of added preservative
Samples checked for dechlorination:	☐Yes ☐No ☑N/A	14.
Headspace in VOA Vials (>6mm):	☐Yes ☐No ☑N/A	15.
Trip Blank Present:	☐Yes ☐No ☑N/A	16.
Trip Blank Custody Seals Present	☐Yes ☐No ☑N/A	
Pace Trip Blank Lot # (if purchased):		

Client Notification/ Resolution: Field Data Required? Y / N

Person Contacted: _____ Date/Time: _____

Comments/ Resolution: _____

Project Manager Review: _____ **Date:** 6-20-11

Note: Whenever there is a discrepancy affecting North Carolina compliance samples, a copy of this form will be sent to the North Carolina DEHNR Certification Office (i.e out of hold, incorrect preservative, out of temp, incorrect containers)

Pace Analytical Services, Inc.
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Billings, MT 591014549
(406)254-7226

October 11, 2011

Kevin Houck
Herrera Environmental Consultants
101 East Broadway, Suite 610
Missoula, MT 59802

RE: Project: Black Pine Mine-REV
Pace Project No.: 10160673

Dear Kevin Houck:
Enclosed are the analytical results for sample(s) received by the laboratory on June 17, 2011. The results relate only to the samples included in this report.

This report has been revised to add Cobalt and delete Silver.

If you have any questions concerning this report, please feel free to contact me.

Sincerely,

Carol Davy

carol.davy@pacelabs.com
Project Manager

Enclosures

cc: Devin Clary, Montana Dept. of Environmental Quality
Mark Donner, Trihydro
Jamie Mongoven, Montana Dept. of Environmental

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CERTIFICATIONS

Project: Black Pine Mine-REV
Pace Project No.: 10160673

Minnesota Certification IDs

1700 Elm Street SE Suite 200, Minneapolis, MN 55414
A2LA Certification #: 2926.01
Alaska Certification #: UST-078
Alaska Certification #MN00064
Arizona Certification #: AZ-0014
Arkansas Certification #: 88-0680
California Certification #: 01155CA
EPA Region 8 Certification #: Pace
Florida/NELAP Certification #: E87605
Georgia Certification #: 959
Idaho Certification #: MN00064
Illinois Certification #: 200011
Iowa Certification #: 368
Kansas Certification #: E-10167
Louisiana Certification #: 03086
Louisiana Certification #: LA080009
Maine Certification #: 2007029
Maryland Certification #: 322
Michigan DEQ Certification #: 9909
Minnesota Certification #: 027-053-137
Mississippi Certification #: Pace
Montana Certification #: MT CERT0092
Nevada Certification #: MN_00064
Nebraska Certification #: Pace
New Jersey Certification #: MN-002
New Mexico Certification #: Pace
New York Certification #: 11647
North Carolina Certification #: 530
North Dakota Certification #: R-036
North Dakota Certification #: R-036A
Ohio VAP Certification #: CL101
Oklahoma Certification #: D9921
Oklahoma Certification #: 9507
Oregon Certification #: MN200001
Pennsylvania Certification #: 68-00563
Puerto Rico Certification
Tennessee Certification #: 02818
Texas Certification #: T104704192
Washington Certification #: C754
Wisconsin Certification #: 999407970

Montana Certification IDs

602 South 25th Street, Billings, MT 59101
EPA Region 8 Certification #: 8TMS-Q
Idaho Certification #: MT00012
Montana Certification #: MT CERT0040
NVLAP Certification #: 101292-0
Minnesota Dept of Health Certification #: 030-999-442

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SAMPLE SUMMARY

Project: Black Pine Mine-REV
Pace Project No.: 10160673

Lab ID	Sample ID	Matrix	Date Collected	Date Received
10160673001	**BP-CML-SD-04-00**	Solid	06/14/11 16:30	06/17/11 08:50
10160673002	**BP-CML-SD-05-00**	Solid	06/14/11 14:25	06/17/11 08:50
10160673003	**BP-CML-SD-03-00**	Solid	06/14/11 13:55	06/17/11 08:50
10160673004	**TSP-6**	Water	06/14/11 13:50	06/17/11 08:50
10160673005	**CML-SW-17**	Water	06/14/11 17:45	06/17/11 08:50
10160673006	**CML-SW-18**	Water	06/14/11 14:20	06/17/11 08:50
10160673007	**CML-SD-09**	Solid	06/14/11 15:00	06/17/11 08:50
10160673008	**CML-SD-10**	Solid	06/14/11 16:45	06/17/11 08:50
10160673009	**CML-SD-07**	Solid	06/14/11 10:10	06/17/11 08:50
10160673010	**CML-SD-08**	Solid	06/14/11 15:15	06/17/11 08:50
10160673011	**CML-SD-11**	Solid	06/14/11 18:00	06/17/11 08:50
10160673012	**CML-SD-01**	Solid	06/14/11 13:23	06/17/11 08:50
10160673013	**CML-SD-02**	Solid	06/15/11 09:20	06/17/11 08:50
10160673014	**BP-CML-SD-03-00**	Solid	06/15/11 08:25	06/17/11 08:50

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SAMPLE ANALYTE COUNT

Project: Black Pine Mine-REV
Pace Project No.: 10160673

Lab ID	Sample ID	Method	Analysts	Analytes Reported	Laboratory
10160673001	**BP-CML-SD-04-00**	EPA 6020	CJS, RJS	12	PASI-M
		EPA 7471	TEM	1	PASI-M
		% Moisture	JDL	1	PASI-M
10160673002	**BP-CML-SD-05-00**	EPA 6020	CJS, RJS	12	PASI-M
		EPA 7471	TEM	1	PASI-M
		% Moisture	JDL	1	PASI-M
10160673003	**BP-CML-SD-03-00**	EPA 6020	CJS, RJS	12	PASI-M
		EPA 7471	TEM	1	PASI-M
		% Moisture	JDL	1	PASI-M
10160673004	**TSP-6**	EPA 200.8	CJS, TL1	12	PASI-M
		SM 2310	CAC	1	PASI-MT
		SM 2540D	SR1	1	PASI-MT
		EPA 300.0	JH1	1	PASI-MT
		SM 2320B	MWD	1	PASI-M
		SM 2540C	PH1	1	PASI-M
10160673005	**CML-SW-17**	EPA 200.8	CJS, TL1	12	PASI-M
		SM 2310	CAC	1	PASI-MT
		SM 2540D	SR1	1	PASI-MT
		EPA 300.0	JH1	1	PASI-MT
		SM 2320B	MWD	1	PASI-M
		SM 2540C	PH1	1	PASI-M
10160673006	**CML-SW-18**	EPA 200.8	CJS, TL1	12	PASI-M
		SM 2310	CAC	1	PASI-MT
		SM 2540D	SR1	1	PASI-MT
		EPA 300.0	JH1	1	PASI-MT
		SM 2320B	MWD	1	PASI-M
		SM 2540C	PH1	1	PASI-M
10160673007	**CML-SD-09**	EPA 6020	CJS, RJS	12	PASI-M
		EPA 7471	TEM	1	PASI-M
		% Moisture	JDL	1	PASI-M
10160673008	**CML-SD-10**	EPA 6020	CJS, RJS	12	PASI-M
		EPA 7471	TEM	1	PASI-M
		% Moisture	JDL	1	PASI-M
10160673009	**CML-SD-07**	EPA 6020	CJS, RJS	12	PASI-M
		EPA 7471	TEM	1	PASI-M
		% Moisture	JDL	1	PASI-M
10160673010	**CML-SD-08**	EPA 6020	CJS, RJS	12	PASI-M

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SAMPLE ANALYTE COUNT

Project: Black Pine Mine-REV
Pace Project No.: 10160673

Lab ID	Sample ID	Method	Analysts	Analytes Reported	Laboratory
		EPA 7471	TEM	1	PASI-M
		% Moisture	JDL	1	PASI-M
10160673011	**CML-SD-11**	EPA 6020	CJS, RJS	12	PASI-M
		EPA 7471	TEM	1	PASI-M
		% Moisture	JDL	1	PASI-M
10160673012	**CML-SD-01**	EPA 6020	CJS, RJS	12	PASI-M
		EPA 7471	TEM	1	PASI-M
		% Moisture	JDL	1	PASI-M
10160673013	**CML-SD-02**	EPA 6020	CJS, RJS	12	PASI-M
		EPA 7471	TEM	1	PASI-M
		% Moisture	JDL	1	PASI-M
10160673014	**BP-CML-SD-03-00**	EPA 6020	CJS, RJS	12	PASI-M
		EPA 7471	TEM	1	PASI-M
		% Moisture	JDL	1	PASI-M

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PROJECT NARRATIVE

Project: Black Pine Mine-REV
Pace Project No.: 10160673

Method: **EPA 200.8**
Description: 200.8 MET ICPMS
Client: Montana Dept. of Environmental Quality
Date: October 11, 2011

General Information:
3 samples were analyzed for EPA 200.8. All samples were received in acceptable condition with any exceptions noted below.

Hold Time:
The samples were analyzed within the method required hold times with any exceptions noted below.

Sample Preparation:
The samples were prepared in accordance with EPA 200.8 with any exceptions noted below.

Initial Calibrations (including MS Tune as applicable):
All criteria were within method requirements with any exceptions noted below.

Continuing Calibration:
All criteria were within method requirements with any exceptions noted below.

Internal Standards:
All internal standards were within QC limits with any exceptions noted below.

Method Blank:
All analytes were below the report limit in the method blank with any exceptions noted below.

Laboratory Control Spike:
All laboratory control spike compounds were within QC limits with any exceptions noted below.

Matrix Spikes:
All percent recoveries and relative percent differences (RPDs) were within acceptance criteria with any exceptions noted below.

QC Batch: MPRP/26726

A matrix spike and matrix spike duplicate (MS/MSD) were performed on the following sample(s): 10160655001,10160673004

M1: Matrix spike recovery exceeded QC limits. Batch accepted based on laboratory control sample (LCS) recovery.

- MS (Lab ID: 998292)
  - Iron
- MS (Lab ID: 998294)
  - Iron
- MSD (Lab ID: 998293)
  - Iron

Duplicate Sample:
All duplicate sample results were within method acceptance criteria with any exceptions noted below.

Additional Comments:

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PROJECT NARRATIVE

Project: Black Pine Mine-REV
Pace Project No.: 10160673

Method: **EPA 6020**
Description: 6020 MET ICPMS
Client: Montana Dept. of Environmental Quality
Date: October 11, 2011

General Information:
11 samples were analyzed for EPA 6020. All samples were received in acceptable condition with any exceptions noted below.

Hold Time:
The samples were analyzed within the method required hold times with any exceptions noted below.

Sample Preparation:
The samples were prepared in accordance with EPA 3050 with any exceptions noted below.

Initial Calibrations (including MS Tune as applicable):
All criteria were within method requirements with any exceptions noted below.

Continuing Calibration:
All criteria were within method requirements with any exceptions noted below.

Internal Standards:
All internal standards were within QC limits with any exceptions noted below.

Method Blank:
All analytes were below the report limit in the method blank with any exceptions noted below.

Laboratory Control Spike:
All laboratory control spike compounds were within QC limits with any exceptions noted below.

Matrix Spikes:
All percent recoveries and relative percent differences (RPDs) were within acceptance criteria with any exceptions noted below.

QC Batch: MPRP/26729

A matrix spike and matrix spike duplicate (MS/MSD) were performed on the following sample(s): 10160673001,10160673014

M6: Matrix spike and Matrix spike duplicate recovery not evaluated against control limits due to sample dilution.

- MS (Lab ID: 998306)
  - Barium
  - Copper
  - Iron
  - Lead
  - Manganese
  - Zinc
- MS (Lab ID: 998308)
  - Antimony
  - Barium
  - Chromium
  - Iron
  - Lead
  - Manganese

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PROJECT NARRATIVE

Project: Black Pine Mine-REV
Pace Project No.: 10160673

Method: **EPA 6020**
Description: 6020 MET ICPMS
Client: Montana Dept. of Environmental Quality
Date: October 11, 2011

QC Batch: MPRP/26729

A matrix spike and matrix spike duplicate (MS/MSD) were performed on the following sample(s): 10160673001,10160673014

M6: Matrix spike and Matrix spike duplicate recovery not evaluated against control limits due to sample dilution.

- Zinc

- MSD (Lab ID: 998307)
  - Barium
  - Iron
  - Lead
  - Manganese
  - Zinc

Duplicate Sample:
All duplicate sample results were within method acceptance criteria with any exceptions noted below.

Additional Comments:

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PROJECT NARRATIVE

Project: Black Pine Mine-REV
Pace Project No.: 10160673

Method: **EPA 7471**
Description: 7471 Mercury
Client: Montana Dept. of Environmental Quality
Date: October 11, 2011

General Information:
11 samples were analyzed for EPA 7471. All samples were received in acceptable condition with any exceptions noted below.

Hold Time:
The samples were analyzed within the method required hold times with any exceptions noted below.

Sample Preparation:
The samples were prepared in accordance with EPA 7471 with any exceptions noted below.

Initial Calibrations (including MS Tune as applicable):
All criteria were within method requirements with any exceptions noted below.

Continuing Calibration:
All criteria were within method requirements with any exceptions noted below.

Method Blank:
All analytes were below the report limit in the method blank with any exceptions noted below.

Laboratory Control Spike:
All laboratory control spike compounds were within QC limits with any exceptions noted below.

Matrix Spikes:
All percent recoveries and relative percent differences (RPDs) were within acceptance criteria with any exceptions noted below.

QC Batch: MERP/5542

A matrix spike and matrix spike duplicate (MS/MSD) were performed on the following sample(s): 10160673001,10160707009

M6: Matrix spike and Matrix spike duplicate recovery not evaluated against control limits due to sample dilution.

- MS (Lab ID: 999062)
  - Mercury
- MS (Lab ID: 999064)
  - Mercury
- MSD (Lab ID: 999063)
  - Mercury

Duplicate Sample:
All duplicate sample results were within method acceptance criteria with any exceptions noted below.

Additional Comments:

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PROJECT NARRATIVE

Project: Black Pine Mine-REV
Pace Project No.: 10160673

Method: **SM 2310**
Description: 2310 Acidity
Client: Montana Dept. of Environmental Quality
Date: October 11, 2011

General Information:
3 samples were analyzed for SM 2310. All samples were received in acceptable condition with any exceptions noted below.

Hold Time:
The samples were analyzed within the method required hold times with any exceptions noted below.

Initial Calibrations (including MS Tune as applicable):
All criteria were within method requirements with any exceptions noted below.

Continuing Calibration:
All criteria were within method requirements with any exceptions noted below.

Internal Standards:
All internal standards were within QC limits with any exceptions noted below.

Surrogates:
All surrogates were within QC limits with any exceptions noted below.

Method Blank:
All analytes were below the report limit in the method blank with any exceptions noted below.

Laboratory Control Spike:
All laboratory control spike compounds were within QC limits with any exceptions noted below.

Matrix Spikes:
All percent recoveries and relative percent differences (RPDs) were within acceptance criteria with any exceptions noted below.

Duplicate Sample:
All duplicate sample results were within method acceptance criteria with any exceptions noted below.

Additional Comments:

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PROJECT NARRATIVE

Project: Black Pine Mine-REV
Pace Project No.: 10160673

Method: **SM 2540D**
Description: 2540D Total Suspended Solids
Client: Montana Dept. of Environmental Quality
Date: October 11, 2011

General Information:
3 samples were analyzed for SM 2540D. All samples were received in acceptable condition with any exceptions noted below.

Hold Time:
The samples were analyzed within the method required hold times with any exceptions noted below.

Initial Calibrations (including MS Tune as applicable):
All criteria were within method requirements with any exceptions noted below.

Continuing Calibration:
All criteria were within method requirements with any exceptions noted below.

Internal Standards:
All internal standards were within QC limits with any exceptions noted below.

Surrogates:
All surrogates were within QC limits with any exceptions noted below.

Method Blank:
All analytes were below the report limit in the method blank with any exceptions noted below.

Laboratory Control Spike:
All laboratory control spike compounds were within QC limits with any exceptions noted below.

Matrix Spikes:
All percent recoveries and relative percent differences (RPDs) were within acceptance criteria with any exceptions noted below.

Duplicate Sample:
All duplicate sample results were within method acceptance criteria with any exceptions noted below.

Additional Comments:

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PROJECT NARRATIVE

Project: Black Pine Mine-REV
Pace Project No.: 10160673

Method: **EPA 300.0**
Description: 300.0 IC Anions
Client: Montana Dept. of Environmental Quality
Date: October 11, 2011

General Information:
3 samples were analyzed for EPA 300.0. All samples were received in acceptable condition with any exceptions noted below.

Hold Time:
The samples were analyzed within the method required hold times with any exceptions noted below.

Initial Calibrations (including MS Tune as applicable):
All criteria were within method requirements with any exceptions noted below.

Continuing Calibration:
All criteria were within method requirements with any exceptions noted below.

Internal Standards:
All internal standards were within QC limits with any exceptions noted below.

Surrogates:
All surrogates were within QC limits with any exceptions noted below.

Method Blank:
All analytes were below the report limit in the method blank with any exceptions noted below.

Laboratory Control Spike:
All laboratory control spike compounds were within QC limits with any exceptions noted below.

Matrix Spikes:
All percent recoveries and relative percent differences (RPDs) were within acceptance criteria with any exceptions noted below.

Duplicate Sample:
All duplicate sample results were within method acceptance criteria with any exceptions noted below.

QC Batch: MT/6195

D6: The relative percent difference (RPD) between the sample and sample duplicate exceeded laboratory control limits.

- DUP (Lab ID: 998641)
  - Sulfate

Additional Comments:

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PROJECT NARRATIVE

Project: Black Pine Mine-REV
Pace Project No.: 10160673

Method: **SM 2320B**
Description: 2320B Alkalinity
Client: Montana Dept. of Environmental Quality
Date: October 11, 2011

General Information:
3 samples were analyzed for SM 2320B. All samples were received in acceptable condition with any exceptions noted below.

Hold Time:
The samples were analyzed within the method required hold times with any exceptions noted below.

Method Blank:
All analytes were below the report limit in the method blank with any exceptions noted below.

Laboratory Control Spike:
All laboratory control spike compounds were within QC limits with any exceptions noted below.

Matrix Spikes:
All percent recoveries and relative percent differences (RPDs) were within acceptance criteria with any exceptions noted below.

QC Batch: WET/22674

A matrix spike and matrix spike duplicate (MS/MSD) were performed on the following sample(s): 10160707001,10160722002

M1: Matrix spike recovery exceeded QC limits. Batch accepted based on laboratory control sample (LCS) recovery.

- MS (Lab ID: 998343)
  - Alkalinity, Total as CaCO3
- MSD (Lab ID: 998344)
  - Alkalinity, Total as CaCO3

Duplicate Sample:
All duplicate sample results were within method acceptance criteria with any exceptions noted below.

Additional Comments:

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PROJECT NARRATIVE

Project: Black Pine Mine-REV
Pace Project No.: 10160673

Method: **SM 2540C**
Description: 2540C Total Dissolved Solids
Client: Montana Dept. of Environmental Quality
Date: October 11, 2011

General Information:
3 samples were analyzed for SM 2540C. All samples were received in acceptable condition with any exceptions noted below.

Hold Time:
The samples were analyzed within the method required hold times with any exceptions noted below.

Method Blank:
All analytes were below the report limit in the method blank with any exceptions noted below.

Laboratory Control Spike:
All laboratory control spike compounds were within QC limits with any exceptions noted below.

Matrix Spikes:
All percent recoveries and relative percent differences (RPDs) were within acceptance criteria with any exceptions noted below.

Duplicate Sample:
All duplicate sample results were within method acceptance criteria with any exceptions noted below.

Additional Comments:

This data package has been reviewed for quality and completeness and is approved for release.

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ANALYTICAL RESULTS

Project: Black Pine Mine-REV
Pace Project No.: 10160673

Sample: BP-CML-SD-04-00 **Lab ID: 10160673001** Collected: 06/14/11 16:30 Received: 06/17/11 08:50 Matrix: Solid

Results reported on a "dry-weight" basis

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
6020 MET ICPMS	Analytical Method: EPA 6020 Preparation Method: EPA 3050							
Antimony	**16.7**	mg/kg	1.2	20	06/28/11 17:42	06/29/11 18:08	7440-36-0	
Arsenic	**27.9**	mg/kg	1.2	20	06/28/11 17:42	06/29/11 18:08	7440-38-2	
Barium	**335**	mg/kg	0.74	20	06/28/11 17:42	06/29/11 18:08	7440-39-3	M6
Cadmium	**1.4**	mg/kg	0.20	20	06/28/11 17:42	06/29/11 18:08	7440-43-9	
Chromium	**8.3**	mg/kg	1.2	20	06/28/11 17:42	06/29/11 18:08	7440-47-3	
Cobalt	**19.3**	mg/kg	1.2	20	06/28/11 17:42	06/29/11 18:08	7440-48-4	
Copper	**109**	mg/kg	1.2	20	06/28/11 17:42	06/29/11 18:08	7440-50-8	M6
Iron	**12400**	mg/kg	123	20	06/28/11 17:42	06/29/11 18:08	7439-89-6	M6
Lead	**74.2**	mg/kg	1.2	100	06/28/11 17:42	07/01/11 11:32	7439-92-1	M6
Manganese	**1980**	mg/kg	6.1	100	06/28/11 17:42	07/01/11 11:32	7439-96-5	M6
Nickel	**11.4**	mg/kg	1.2	20	06/28/11 17:42	06/29/11 18:08	7440-02-0	
Zinc	**144**	mg/kg	12.3	20	06/28/11 17:42	06/29/11 18:08	7440-66-6	M6
7471 Mercury	Analytical Method: EPA 7471 Preparation Method: EPA 7471							
Mercury	**14.4**	mg/kg	1.1	20	06/29/11 16:02	06/30/11 08:56	7439-97-6	M6
Dry Weight	Analytical Method: % Moisture							
Percent Moisture	**67.7**	%	0.10	1		06/27/11 00:00		

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ANALYTICAL RESULTS

Project: Black Pine Mine-REV
Pace Project No.: 10160673

Sample: BP-CML-SD-05-00 **Lab ID: 10160673002** Collected: 06/14/11 14:25 Received: 06/17/11 08:50 Matrix: Solid

Results reported on a "dry-weight" basis

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
6020 MET ICPMS	Analytical Method: EPA 6020 Preparation Method: EPA 3050							
Antimony	**<0.64**	mg/kg	0.64	20	06/28/11 17:42	06/29/11 18:27	7440-36-0	
Arsenic	**12.0**	mg/kg	0.64	20	06/28/11 17:42	06/29/11 18:27	7440-38-2	
Barium	**452**	mg/kg	0.38	20	06/28/11 17:42	06/29/11 18:27	7440-39-3	
Cadmium	**1.2**	mg/kg	0.10	20	06/28/11 17:42	06/29/11 18:27	7440-43-9	
Chromium	**11.8**	mg/kg	0.64	20	06/28/11 17:42	06/29/11 18:27	7440-47-3	
Cobalt	**8.1**	mg/kg	0.64	20	06/28/11 17:42	06/29/11 18:27	7440-48-4	
Copper	**26.8**	mg/kg	0.64	20	06/28/11 17:42	06/29/11 18:27	7440-50-8	
Iron	**14500**	mg/kg	63.9	20	06/28/11 17:42	06/29/11 18:27	7439-89-6	
Lead	**16.3**	mg/kg	0.64	100	06/28/11 17:42	07/01/11 11:46	7439-92-1	
Manganese	**1160**	mg/kg	3.2	100	06/28/11 17:42	07/01/11 11:46	7439-96-5	
Nickel	**13.4**	mg/kg	0.64	20	06/28/11 17:42	06/29/11 18:27	7440-02-0	
Zinc	**96.8**	mg/kg	6.4	20	06/28/11 17:42	06/29/11 18:27	7440-66-6	
7471 Mercury	Analytical Method: EPA 7471 Preparation Method: EPA 7471							
Mercury	**0.38**	mg/kg	0.031	1	06/29/11 16:02	06/30/11 10:33	7439-97-6	
Dry Weight	Analytical Method: % Moisture							
Percent Moisture	**43.7**	%	0.10	1		06/27/11 00:00		

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ANALYTICAL RESULTS

Project: Black Pine Mine-REV
Pace Project No.: 10160673

Sample: BP-CML-SD-03-00 **Lab ID: 10160673003** Collected: 06/14/11 13:55 Received: 06/17/11 08:50 Matrix: Solid

Results reported on a "dry-weight" basis

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
6020 MET ICPMS	Analytical Method: EPA 6020 Preparation Method: EPA 3050							
Antimony	**3.3**	mg/kg	1.4	20	06/28/11 17:42	06/29/11 18:31	7440-36-0	
Arsenic	**20.2**	mg/kg	1.4	20	06/28/11 17:42	06/29/11 18:31	7440-38-2	
Barium	**800**	mg/kg	0.86	20	06/28/11 17:42	06/29/11 18:31	7440-39-3	
Cadmium	**1.8**	mg/kg	0.23	20	06/28/11 17:42	06/29/11 18:31	7440-43-9	
Chromium	**23.5**	mg/kg	1.4	20	06/28/11 17:42	06/29/11 18:31	7440-47-3	
Cobalt	**10.7**	mg/kg	1.4	20	06/28/11 17:42	06/29/11 18:31	7440-48-4	
Copper	**87.7**	mg/kg	1.4	20	06/28/11 17:42	06/29/11 18:31	7440-50-8	
Iron	**20600**	mg/kg	143	20	06/28/11 17:42	06/29/11 18:31	7439-89-6	
Lead	**39.2**	mg/kg	1.4	100	06/28/11 17:42	07/01/11 11:50	7439-92-1	
Manganese	**1150**	mg/kg	1.4	20	06/28/11 17:42	06/29/11 18:31	7439-96-5	
Nickel	**31.2**	mg/kg	1.4	20	06/28/11 17:42	06/29/11 18:31	7440-02-0	
Zinc	**136**	mg/kg	14.3	20	06/28/11 17:42	06/29/11 18:31	7440-66-6	
7471 Mercury	Analytical Method: EPA 7471 Preparation Method: EPA 7471							
Mercury	**0.76**	mg/kg	0.070	1	06/29/11 16:02	06/30/11 10:35	7439-97-6	
Dry Weight	Analytical Method: % Moisture							
Percent Moisture	**71.6**	%	0.10	1		06/27/11 00:00		

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ANALYTICAL RESULTS

Project: Black Pine Mine-REV
Pace Project No.: 10160673

Sample: TSP-6 **Lab ID: 10160673004** Collected: 06/14/11 13:50 Received: 06/17/11 08:50 Matrix: Water

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
200.8 MET ICPMS	Analytical Method: EPA 200.8 Preparation Method: EPA 200.8							
Antimony	**0.53**	ug/L	0.50	1	06/28/11 15:18	06/30/11 06:59	7440-36-0	
Arsenic	**1.1**	ug/L	0.50	1	06/28/11 15:18	06/30/11 06:59	7440-38-2	
Barium	**85.4**	ug/L	0.30	1	06/28/11 15:18	06/30/11 06:59	7440-39-3	
Cadmium	**<0.080**	ug/L	0.080	1	06/28/11 15:18	06/30/11 06:59	7440-43-9	
Chromium	**1.3**	ug/L	0.50	1	06/28/11 15:18	06/30/11 06:59	7440-47-3	
Copper	**22.5**	ug/L	0.50	1	06/28/11 15:18	06/30/11 06:59	7440-50-8	
Iron	**1000**	ug/L	50.0	1	06/28/11 15:18	06/30/11 06:59	7439-89-6	M1
Lead	**0.97**	ug/L	0.10	1	06/28/11 15:18	06/30/11 06:59	7439-92-1	
Manganese	**8.9**	ug/L	0.50	1	06/28/11 15:18	06/30/11 06:59	7439-96-5	
Nickel	**2.2**	ug/L	0.50	1	06/28/11 15:18	06/30/11 06:59	7440-02-0	
Silver	**<0.50**	ug/L	0.50	1	06/28/11 15:18	06/30/11 14:55	7440-22-4	
Zinc	**8.2**	ug/L	5.0	1	06/28/11 15:18	06/30/11 06:59	7440-66-6	
2310 Acidity	Analytical Method: SM 2310							
Acidity	**12.0**	mg/L	5.0	1		06/24/11 16:00		
2540D Total Suspended Solids	Analytical Method: SM 2540D							
Total Suspended Solids	**2.7**	mg/L	1.0	1		06/20/11 10:40		
300.0 IC Anions	Analytical Method: EPA 300.0							
Sulfate	**4.2**	mg/L	1.0	1		06/24/11 07:45	14808-79-8	
2320B Alkalinity	Analytical Method: SM 2320B							
Alkalinity, Total as CaCO3	**12.1**	mg/L	5.0	1		06/20/11 11:49		
2540C Total Dissolved Solids	Analytical Method: SM 2540C							
Total Dissolved Solids	**101**	mg/L	10.0	1		06/20/11 11:22		

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ANALYTICAL RESULTS

Project: Black Pine Mine-REV
Pace Project No.: 10160673

Sample: CML-SW-17 **Lab ID: 10160673005** Collected: 06/14/11 17:45 Received: 06/17/11 08:50 Matrix: Water

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
200.8 MET ICPMS	Analytical Method: EPA 200.8 Preparation Method: EPA 200.8							
Antimony	**<0.50**	ug/L	0.50	1	06/28/11 15:18	06/30/11 06:37	7440-36-0	
Arsenic	**<0.50**	ug/L	0.50	1	06/28/11 15:18	06/30/11 06:37	7440-38-2	
Barium	**8.7**	ug/L	0.30	1	06/28/11 15:18	06/30/11 06:37	7440-39-3	
Cadmium	**<0.080**	ug/L	0.080	1	06/28/11 15:18	06/30/11 06:37	7440-43-9	
Chromium	**<0.50**	ug/L	0.50	1	06/28/11 15:18	06/30/11 06:37	7440-47-3	
Copper	**2.4**	ug/L	0.50	1	06/28/11 15:18	06/30/11 06:37	7440-50-8	
Iron	**115**	ug/L	50.0	1	06/28/11 15:18	06/30/11 06:37	7439-89-6	
Lead	**0.13**	ug/L	0.10	1	06/28/11 15:18	06/30/11 06:37	7439-92-1	
Manganese	**1.7**	ug/L	0.50	1	06/28/11 15:18	06/30/11 06:37	7439-96-5	
Nickel	**<0.50**	ug/L	0.50	1	06/28/11 15:18	06/30/11 06:37	7440-02-0	
Silver	**<0.50**	ug/L	0.50	1	06/28/11 15:18	06/30/11 14:58	7440-22-4	
Zinc	**12.5**	ug/L	5.0	1	06/28/11 15:18	06/30/11 06:37	7440-66-6	
2310 Acidity	Analytical Method: SM 2310							
Acidity	**15.8**	mg/L	5.0	1		06/24/11 16:00		
2540D Total Suspended Solids	Analytical Method: SM 2540D							
Total Suspended Solids	**<1.0**	mg/L	1.0	1		06/20/11 10:40		
300.0 IC Anions	Analytical Method: EPA 300.0							
Sulfate	**4.4**	mg/L	1.0	1		06/24/11 08:13	14808-79-8	
2320B Alkalinity	Analytical Method: SM 2320B							
Alkalinity, Total as CaCO3	**<5.0**	mg/L	5.0	1		06/20/11 11:53		
2540C Total Dissolved Solids	Analytical Method: SM 2540C							
Total Dissolved Solids	**42.0**	mg/L	10.0	1		06/20/11 11:22		

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ANALYTICAL RESULTS

Project: Black Pine Mine-REV
Pace Project No.: 10160673

Sample: CML-SW-18 **Lab ID: 10160673006** Collected: 06/14/11 14:20 Received: 06/17/11 08:50 Matrix: Water

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
200.8 MET ICPMS	Analytical Method: EPA 200.8 Preparation Method: EPA 200.8							
Antimony	**<0.50**	ug/L	0.50	1	06/28/11 15:18	06/30/11 07:08	7440-36-0	
Arsenic	**<0.50**	ug/L	0.50	1	06/28/11 15:18	06/30/11 07:08	7440-38-2	
Barium	**20.4**	ug/L	0.30	1	06/28/11 15:18	06/30/11 07:08	7440-39-3	
Cadmium	**<0.080**	ug/L	0.080	1	06/28/11 15:18	06/30/11 07:08	7440-43-9	
Chromium	**<0.50**	ug/L	0.50	1	06/28/11 15:18	06/30/11 07:08	7440-47-3	
Copper	**2.0**	ug/L	0.50	1	06/28/11 15:18	06/30/11 07:08	7440-50-8	
Iron	**158**	ug/L	50.0	1	06/28/11 15:18	06/30/11 07:08	7439-89-6	
Lead	**0.27**	ug/L	0.10	1	06/28/11 15:18	06/30/11 07:08	7439-92-1	
Manganese	**1.0**	ug/L	0.50	1	06/28/11 15:18	06/30/11 07:08	7439-96-5	
Nickel	**<0.50**	ug/L	0.50	1	06/28/11 15:18	06/30/11 07:08	7440-02-0	
Silver	**<0.50**	ug/L	0.50	1	06/28/11 15:18	06/30/11 15:01	7440-22-4	
Zinc	**<5.0**	ug/L	5.0	1	06/28/11 15:18	06/30/11 07:08	7440-66-6	
2310 Acidity	Analytical Method: SM 2310							
Acidity	**<5.0**	mg/L	5.0	1		06/24/11 16:00		
2540D Total Suspended Solids	Analytical Method: SM 2540D							
Total Suspended Solids	**<2.0**	mg/L	2.0	1		06/20/11 10:40		
300.0 IC Anions	Analytical Method: EPA 300.0							
Sulfate	**2.7**	mg/L	1.0	1		06/24/11 08:42	14808-79-8	
2320B Alkalinity	Analytical Method: SM 2320B							
Alkalinity, Total as CaCO3	**5.4**	mg/L	5.0	1		06/20/11 12:03		
2540C Total Dissolved Solids	Analytical Method: SM 2540C							
Total Dissolved Solids	**53.0**	mg/L	10.0	1		06/20/11 11:23		

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ANALYTICAL RESULTS

Project: Black Pine Mine-REV
Pace Project No.: 10160673

Sample: CML-SD-09 **Lab ID: 10160673007** Collected: 06/14/11 15:00 Received: 06/17/11 08:50 Matrix: Solid

Results reported on a "dry-weight" basis

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
6020 MET ICPMS	Analytical Method: EPA 6020 Preparation Method: EPA 3050							
Antimony	**465**	mg/kg	0.55	20	06/28/11 17:42	06/29/11 18:36	7440-36-0	
Arsenic	**377**	mg/kg	0.55	20	06/28/11 17:42	06/29/11 18:36	7440-38-2	
Barium	**163**	mg/kg	0.33	20	06/28/11 17:42	06/29/11 18:36	7440-39-3	
Cadmium	**7.8**	mg/kg	0.087	20	06/28/11 17:42	06/29/11 18:36	7440-43-9	
Chromium	**5.4**	mg/kg	0.55	20	06/28/11 17:42	06/29/11 18:36	7440-47-3	
Cobalt	**7.8**	mg/kg	0.55	20	06/28/11 17:42	06/29/11 18:36	7440-48-4	
Copper	**920**	mg/kg	5.5	200	06/28/11 17:42	07/01/11 11:54	7440-50-8	
Iron	**15400**	mg/kg	54.5	20	06/28/11 17:42	06/29/11 18:36	7439-89-6	
Lead	**2070**	mg/kg	1.1	200	06/28/11 17:42	07/01/11 11:54	7439-92-1	
Manganese	**452**	mg/kg	0.55	20	06/28/11 17:42	06/29/11 18:36	7439-96-5	
Nickel	**5.2**	mg/kg	0.55	20	06/28/11 17:42	06/29/11 18:36	7440-02-0	
Zinc	**287**	mg/kg	5.5	20	06/28/11 17:42	06/29/11 18:36	7440-66-6	
7471 Mercury	Analytical Method: EPA 7471 Preparation Method: EPA 7471							
Mercury	**5.4**	mg/kg	0.54	20	06/29/11 16:02	06/30/11 09:42	7439-97-6	
Dry Weight	Analytical Method: % Moisture							
Percent Moisture	**26.1**	%	0.10	1		06/27/11 00:00		

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ANALYTICAL RESULTS

Project: Black Pine Mine-REV
Pace Project No.: 10160673

Sample: CML-SD-10 **Lab ID: 10160673008** Collected: 06/14/11 16:45 Received: 06/17/11 08:50 Matrix: Solid

Results reported on a "dry-weight" basis

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
6020 MET ICPMS	Analytical Method: EPA 6020 Preparation Method: EPA 3050							
Antimony	**596**	mg/kg	5.8	200	06/28/11 17:42	07/01/11 11:59	7440-36-0	
Arsenic	**492**	mg/kg	0.58	20	06/28/11 17:42	06/29/11 19:03	7440-38-2	
Barium	**185**	mg/kg	0.35	20	06/28/11 17:42	06/29/11 19:03	7440-39-3	
Cadmium	**10.3**	mg/kg	0.092	20	06/28/11 17:42	06/29/11 19:03	7440-43-9	
Chromium	**5.2**	mg/kg	0.58	20	06/28/11 17:42	06/29/11 19:03	7440-47-3	
Cobalt	**6.2**	mg/kg	0.58	20	06/28/11 17:42	06/29/11 19:03	7440-48-4	
Copper	**1160**	mg/kg	5.8	200	06/28/11 17:42	07/01/11 11:59	7440-50-8	
Iron	**19700**	mg/kg	57.7	20	06/28/11 17:42	06/29/11 19:03	7439-89-6	
Lead	**2460**	mg/kg	1.2	200	06/28/11 17:42	07/01/11 11:59	7439-92-1	
Manganese	**419**	mg/kg	0.58	20	06/28/11 17:42	06/29/11 19:03	7439-96-5	
Nickel	**4.9**	mg/kg	0.58	20	06/28/11 17:42	06/29/11 19:03	7440-02-0	
Zinc	**401**	mg/kg	5.8	20	06/28/11 17:42	06/29/11 19:03	7440-66-6	
7471 Mercury	Analytical Method: EPA 7471 Preparation Method: EPA 7471							
Mercury	**7.0**	mg/kg	0.52	20	06/29/11 16:02	06/30/11 09:44	7439-97-6	
Dry Weight	Analytical Method: % Moisture							
Percent Moisture	**30.1**	%	0.10	1		06/27/11 00:00		

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ANALYTICAL RESULTS

Project: Black Pine Mine-REV
Pace Project No.: 10160673

Sample: CML-SD-07 **Lab ID: 10160673009** Collected: 06/14/11 10:10 Received: 06/17/11 08:50 Matrix: Solid

Results reported on a "dry-weight" basis

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
6020 MET ICPMS	Analytical Method: EPA 6020 Preparation Method: EPA 3050							
Antimony	**817**	mg/kg	7.6	200	06/28/11 17:42	07/01/11 12:03	7440-36-0	
Arsenic	**596**	mg/kg	0.76	20	06/28/11 17:42	06/29/11 19:08	7440-38-2	
Barium	**340**	mg/kg	0.45	20	06/28/11 17:42	06/29/11 19:08	7440-39-3	
Cadmium	**15.4**	mg/kg	0.12	20	06/28/11 17:42	06/29/11 19:08	7440-43-9	
Chromium	**8.3**	mg/kg	0.76	20	06/28/11 17:42	06/29/11 19:08	7440-47-3	
Cobalt	**10.4**	mg/kg	0.76	20	06/28/11 17:42	06/29/11 19:08	7440-48-4	
Copper	**5320**	mg/kg	7.6	200	06/28/11 17:42	07/01/11 12:03	7440-50-8	
Iron	**21800**	mg/kg	75.6	20	06/28/11 17:42	06/29/11 19:08	7439-89-6	
Lead	**4240**	mg/kg	1.5	200	06/28/11 17:42	07/01/11 12:03	7439-92-1	
Manganese	**1180**	mg/kg	7.6	200	06/28/11 17:42	07/01/11 12:03	7439-96-5	
Nickel	**6.1**	mg/kg	0.76	20	06/28/11 17:42	06/29/11 19:08	7440-02-0	
Zinc	**393**	mg/kg	7.6	20	06/28/11 17:42	06/29/11 19:08	7440-66-6	
7471 Mercury	Analytical Method: EPA 7471 Preparation Method: EPA 7471							
Mercury	**10.1**	mg/kg	0.62	20	06/29/11 16:02	06/30/11 10:00	7439-97-6	
Dry Weight	Analytical Method: % Moisture							
Percent Moisture	**35.8**	%	0.10	1		06/27/11 00:00		

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ANALYTICAL RESULTS

Project: Black Pine Mine-REV
Pace Project No.: 10160673

Sample: CML-SD-08 **Lab ID: 10160673010** Collected: 06/14/11 15:15 Received: 06/17/11 08:50 Matrix: Solid

Results reported on a "dry-weight" basis

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
6020 MET ICPMS	Analytical Method: EPA 6020 Preparation Method: EPA 3050							
Antimony	**613**	mg/kg	6.3	200	06/28/11 17:42	07/01/11 12:16	7440-36-0	
Arsenic	**553**	mg/kg	0.63	20	06/28/11 17:42	06/29/11 19:12	7440-38-2	
Barium	**244**	mg/kg	0.38	20	06/28/11 17:42	06/29/11 19:12	7440-39-3	
Cadmium	**11.5**	mg/kg	0.10	20	06/28/11 17:42	06/29/11 19:12	7440-43-9	
Chromium	**5.6**	mg/kg	0.63	20	06/28/11 17:42	06/29/11 19:12	7440-47-3	
Cobalt	**6.7**	mg/kg	0.63	20	06/28/11 17:42	06/29/11 19:12	7440-48-4	
Copper	**1390**	mg/kg	6.3	200	06/28/11 17:42	07/01/11 12:16	7440-50-8	
Iron	**20100**	mg/kg	62.5	20	06/28/11 17:42	06/29/11 19:12	7439-89-6	
Lead	**2960**	mg/kg	1.3	200	06/28/11 17:42	07/01/11 12:16	7439-92-1	
Manganese	**443**	mg/kg	0.63	20	06/28/11 17:42	06/29/11 19:12	7439-96-5	
Nickel	**5.8**	mg/kg	0.63	20	06/28/11 17:42	06/29/11 19:12	7440-02-0	
Zinc	**430**	mg/kg	6.3	20	06/28/11 17:42	06/29/11 19:12	7440-66-6	
7471 Mercury	Analytical Method: EPA 7471 Preparation Method: EPA 7471							
Mercury	**12.1**	mg/kg	0.56	20	06/29/11 16:02	06/30/11 09:52	7439-97-6	
Dry Weight	Analytical Method: % Moisture							
Percent Moisture	**36.5**	%	0.10	1		06/27/11 00:00		

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ANALYTICAL RESULTS

Project: Black Pine Mine-REV
Pace Project No.: 10160673

Sample: CML-SD-11 **Lab ID: 10160673011** Collected: 06/14/11 18:00 Received: 06/17/11 08:50 Matrix: Solid

Results reported on a "dry-weight" basis

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
6020 MET ICPMS	Analytical Method: EPA 6020 Preparation Method: EPA 3050							
Antimony	**307**	mg/kg	0.57	20	06/28/11 17:42	06/29/11 19:21	7440-36-0	
Arsenic	**219**	mg/kg	0.57	20	06/28/11 17:42	06/29/11 19:21	7440-38-2	
Barium	**145**	mg/kg	0.34	20	06/28/11 17:42	06/29/11 19:21	7440-39-3	
Cadmium	**4.6**	mg/kg	0.091	20	06/28/11 17:42	06/29/11 19:21	7440-43-9	
Chromium	**6.1**	mg/kg	0.57	20	06/28/11 17:42	06/29/11 19:21	7440-47-3	
Cobalt	**11.5**	mg/kg	0.57	20	06/28/11 17:42	06/29/11 19:21	7440-48-4	
Copper	**623**	mg/kg	5.7	200	06/28/11 17:42	07/01/11 12:21	7440-50-8	
Iron	**16300**	mg/kg	57.0	20	06/28/11 17:42	06/29/11 19:21	7439-89-6	
Lead	**1170**	mg/kg	1.1	200	06/28/11 17:42	07/01/11 12:21	7439-92-1	
Manganese	**1210**	mg/kg	5.7	200	06/28/11 17:42	07/01/11 12:21	7439-96-5	
Nickel	**6.5**	mg/kg	0.57	20	06/28/11 17:42	06/29/11 19:21	7440-02-0	
Zinc	**248**	mg/kg	5.7	20	06/28/11 17:42	06/29/11 19:21	7440-66-6	
7471 Mercury	Analytical Method: EPA 7471 Preparation Method: EPA 7471							
Mercury	**21.1**	mg/kg	0.51	20	06/29/11 16:02	06/30/11 09:54	7439-97-6	
Dry Weight	Analytical Method: % Moisture							
Percent Moisture	**21.0**	%	0.10	1		06/27/11 00:00		

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ANALYTICAL RESULTS

Project: Black Pine Mine-REV
Pace Project No.: 10160673

Sample: CML-SD-01 **Lab ID: 10160673012** Collected: 06/14/11 13:23 Received: 06/17/11 08:50 Matrix: Solid

Results reported on a "dry-weight" basis

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
6020 MET ICPMS	Analytical Method: EPA 6020 Preparation Method: EPA 3050							
Antimony	**317**	mg/kg	0.50	20	06/28/11 17:42	06/29/11 20:02	7440-36-0	
Arsenic	**223**	mg/kg	0.50	20	06/28/11 17:42	06/29/11 20:02	7440-38-2	
Barium	**74.5**	mg/kg	3.0	200	06/28/11 17:42	07/01/11 12:25	7440-39-3	
Cadmium	**4.8**	mg/kg	0.079	20	06/28/11 17:42	06/29/11 20:02	7440-43-9	
Chromium	**6.2**	mg/kg	0.50	20	06/28/11 17:42	06/29/11 20:02	7440-47-3	
Cobalt	**7.6**	mg/kg	0.50	20	06/28/11 17:42	06/29/11 20:02	7440-48-4	
Copper	**378**	mg/kg	5.0	200	06/28/11 17:42	07/01/11 12:25	7440-50-8	
Iron	**14400**	mg/kg	49.5	20	06/28/11 17:42	06/29/11 20:02	7439-89-6	
Lead	**826**	mg/kg	0.99	200	06/28/11 17:42	07/01/11 12:25	7439-92-1	
Manganese	**413**	mg/kg	0.50	20	06/28/11 17:42	06/29/11 20:02	7439-96-5	
Nickel	**3.9**	mg/kg	0.50	20	06/28/11 17:42	06/29/11 20:02	7440-02-0	
Zinc	**188**	mg/kg	5.0	20	06/28/11 17:42	06/29/11 20:02	7440-66-6	
7471 Mercury	Analytical Method: EPA 7471 Preparation Method: EPA 7471							
Mercury	**17.6**	mg/kg	0.46	20	06/29/11 16:02	06/30/11 10:02	7439-97-6	
Dry Weight	Analytical Method: % Moisture							
Percent Moisture	**15.2**	%	0.10	1		06/27/11 00:00		

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ANALYTICAL RESULTS

Project: Black Pine Mine-REV
Pace Project No.: 10160673

Sample: CML-SD-02 **Lab ID: 10160673013** Collected: 06/15/11 09:20 Received: 06/17/11 08:50 Matrix: Solid

Results reported on a "dry-weight" basis

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
6020 MET ICPMS	Analytical Method: EPA 6020 Preparation Method: EPA 3050							
Antimony	**461**	mg/kg	0.67	20	06/28/11 17:42	06/29/11 19:26	7440-36-0	
Arsenic	**417**	mg/kg	0.67	20	06/28/11 17:42	06/29/11 19:26	7440-38-2	
Barium	**308**	mg/kg	0.40	20	06/28/11 17:42	06/29/11 19:26	7440-39-3	
Cadmium	**8.9**	mg/kg	0.11	20	06/28/11 17:42	06/29/11 19:26	7440-43-9	
Chromium	**8.4**	mg/kg	0.67	20	06/28/11 17:42	06/29/11 19:26	7440-47-3	
Cobalt	**10.9**	mg/kg	0.67	20	06/28/11 17:42	06/29/11 19:26	7440-48-4	
Copper	**1430**	mg/kg	6.7	200	06/28/11 17:42	07/01/11 12:41	7440-50-8	
Iron	**22700**	mg/kg	67.0	20	06/28/11 17:42	06/29/11 19:26	7439-89-6	
Lead	**1970**	mg/kg	1.3	200	06/28/11 17:42	07/01/11 12:41	7439-92-1	
Manganese	**744**	mg/kg	6.7	200	06/28/11 17:42	07/01/11 12:41	7439-96-5	
Nickel	**6.9**	mg/kg	0.67	20	06/28/11 17:42	06/29/11 19:26	7440-02-0	
Zinc	**317**	mg/kg	6.7	20	06/28/11 17:42	06/29/11 19:26	7440-66-6	
7471 Mercury	Analytical Method: EPA 7471 Preparation Method: EPA 7471							
Mercury	**13.6**	mg/kg	0.50	20	06/29/11 16:02	06/30/11 10:37	7439-97-6	
Dry Weight	Analytical Method: % Moisture							
Percent Moisture	**29.6**	%	0.10	1		06/27/11 00:00		

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ANALYTICAL RESULTS

Project: Black Pine Mine-REV
Pace Project No.: 10160673

Sample: BP-CML-SD-03-00 **Lab ID: 10160673014** Collected: 06/15/11 08:25 Received: 06/17/11 08:50 Matrix: Solid

Results reported on a "dry-weight" basis

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
6020 MET ICPMS	Analytical Method: EPA 6020 Preparation Method: EPA 3050							
Antimony	**16.8**	mg/kg	0.75	20	06/28/11 17:42	06/29/11 19:35	7440-36-0	M6
Arsenic	**19.4**	mg/kg	0.75	20	06/28/11 17:42	06/29/11 19:35	7440-38-2	
Barium	**143**	mg/kg	0.45	20	06/28/11 17:42	06/29/11 19:35	7440-39-3	M6
Cadmium	**0.43**	mg/kg	0.12	20	06/28/11 17:42	06/29/11 19:35	7440-43-9	
Chromium	**20.7**	mg/kg	0.75	20	06/28/11 17:42	06/29/11 19:35	7440-47-3	M6
Cobalt	**7.6**	mg/kg	0.75	20	06/28/11 17:42	06/29/11 19:35	7440-48-4	
Copper	**57.9**	mg/kg	0.75	20	06/28/11 17:42	06/29/11 19:35	7440-50-8	
Iron	**22300**	mg/kg	75.3	20	06/28/11 17:42	06/29/11 19:35	7439-89-6	M6
Lead	**207**	mg/kg	1.5	200	06/28/11 17:42	07/01/11 12:45	7439-92-1	M6
Manganese	**404**	mg/kg	0.75	20	06/28/11 17:42	06/29/11 19:35	7439-96-5	M6
Nickel	**9.1**	mg/kg	0.75	20	06/28/11 17:42	06/29/11 19:35	7440-02-0	
Zinc	**40.5**	mg/kg	7.5	20	06/28/11 17:42	06/29/11 19:35	7440-66-6	M6
7471 Mercury	Analytical Method: EPA 7471 Preparation Method: EPA 7471							
Mercury	**4.1**	mg/kg	0.69	20	06/29/11 16:02	06/30/11 10:14	7439-97-6	
Dry Weight	Analytical Method: % Moisture							
Percent Moisture	**43.8**	%	0.10	1		06/27/11 00:00		

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QUALITY CONTROL DATA

Project: Black Pine Mine-REV
Pace Project No.: 10160673

QC Batch: MPRP/26726 Analysis Method: EPA 200.8
QC Batch Method: EPA 200.8 Analysis Description: 200.8 MET
Associated Lab Samples: 10160673004, 10160673005, 10160673006

METHOD BLANK: 998290 Matrix: Water
Associated Lab Samples: 10160673004, 10160673005, 10160673006

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Antimony	ug/L	<0.50	0.50	06/30/11 06:01	
Arsenic	ug/L	<0.50	0.50	06/30/11 06:01	
Barium	ug/L	<0.30	0.30	06/30/11 06:01	
Cadmium	ug/L	<0.080	0.080	06/30/11 06:01	
Chromium	ug/L	<0.50	0.50	06/30/11 06:01	
Copper	ug/L	<0.50	0.50	06/30/11 06:01	
Iron	ug/L	<50.0	50.0	06/30/11 06:01	
Lead	ug/L	<0.10	0.10	06/30/11 06:01	
Manganese	ug/L	<0.50	0.50	06/30/11 06:01	
Nickel	ug/L	<0.50	0.50	06/30/11 06:01	
Silver	ug/L	<0.50	0.50	06/30/11 06:01	
Zinc	ug/L	<5.0	5.0	06/30/11 06:01	

LABORATORY CONTROL SAMPLE: 998291

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Antimony	ug/L	80	79.8	100	85-115	
Arsenic	ug/L	80	82.4	103	85-115	
Barium	ug/L	80	81.9	102	85-115	
Cadmium	ug/L	80	81.5	102	85-115	
Chromium	ug/L	80	81.8	102	85-115	
Copper	ug/L	80	85.5	107	85-115	
Iron	ug/L	1000	1020	102	85-115	
Lead	ug/L	80	81.7	102	85-115	
Manganese	ug/L	80	82.0	102	85-115	
Nickel	ug/L	80	79.6	99	85-115	
Silver	ug/L	80	86.3	108	85-115	
Zinc	ug/L	80	77.7	97	85-115	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 998292 998293

Parameter	Units	10160655001 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Antimony	ug/L	42.9	80	80	125	128	103	106	70-130	2	20	
Arsenic	ug/L	12.8	80	80	95.3	95.4	103	103	70-130	.1	20	
Barium	ug/L	81.7	80	80	170	170	111	110	70-130	.5	20	
Cadmium	ug/L	1.2	80	80	84.3	82.5	104	102	70-130	2	20	
Chromium	ug/L	1.3	80	80	85.1	84.1	105	104	70-130	1	20	
Copper	ug/L	221	80	80	314	311	116	114	70-130	.7	20	
Iron	ug/L	1430	1000	1000	2810	2900	138	147	70-130	3	20	M1

REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL DATA

Project: Black Pine Mine-REV
Pace Project No.: 10160673

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 998292 998293

Parameter	Units	10160655001 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Lead	ug/L	49.0	80	80	133	134	104	106	70-130	.8	20	
Manganese	ug/L	12.9	80	80	96.2	96.9	104	105	70-130	.7	20	
Nickel	ug/L	2.1	80	80	81.6	81.0	99	99	70-130	.8	20	
Silver	ug/L	0.64	80	80	80.9	84.1	100	104	70-130	4	20	
Zinc	ug/L	40.5	80	80	122	120	101	99	70-130	2	20	

MATRIX SPIKE SAMPLE: 998294

Parameter	Units	10160673004 Result	Spike Conc.	MS Result	MS % Rec	% Rec Limits	Qualifiers
Antimony	ug/L	0.53	80	78.9	98	70-130	
Arsenic	ug/L	1.1	80	82.3	101	70-130	
Barium	ug/L	85.4	80	169	104	70-130	
Cadmium	ug/L	<0.080	80	80.3	100	70-130	
Chromium	ug/L	1.3	80	83.0	102	70-130	
Copper	ug/L	22.5	80	106	104	70-130	
Iron	ug/L	1000	1000	2310	131	70-130	M1
Lead	ug/L	0.97	80	81.2	100	70-130	
Manganese	ug/L	8.9	80	89.0	100	70-130	
Nickel	ug/L	2.2	80	79.7	97	70-130	
Silver	ug/L	<0.50	80	78.7	98	70-130	
Zinc	ug/L	8.2	80	85.9	97	70-130	

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QUALITY CONTROL DATA

Project: Black Pine Mine-REV
Pace Project No.: 10160673

QC Batch: MPRP/26729 Analysis Method: EPA 6020
QC Batch Method: EPA 3050 Analysis Description: 6020 MET
Associated Lab Samples: 10160673001, 10160673002, 10160673003, 10160673007, 10160673008, 10160673009, 10160673010, 10160673011, 10160673012, 10160673013, 10160673014

METHOD BLANK: 998304 Matrix: Solid
Associated Lab Samples: 10160673001, 10160673002, 10160673003, 10160673007, 10160673008, 10160673009, 10160673010, 10160673011, 10160673012, 10160673013, 10160673014

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Antimony	mg/kg	<0.41	0.41	06/29/11 18:04	
Arsenic	mg/kg	<0.41	0.41	06/29/11 18:04	
Barium	mg/kg	<0.25	0.25	06/29/11 18:04	
Cadmium	mg/kg	<0.066	0.066	06/29/11 18:04	
Chromium	mg/kg	<0.41	0.41	06/29/11 18:04	
Cobalt	mg/kg	<0.41	0.41	06/29/11 18:04	
Copper	mg/kg	<0.41	0.41	06/29/11 18:04	
Iron	mg/kg	<41.3	41.3	06/29/11 18:04	
Lead	mg/kg	<0.083	0.083	07/01/11 11:24	
Manganese	mg/kg	<0.41	0.41	06/29/11 18:04	
Nickel	mg/kg	<0.41	0.41	06/29/11 18:04	
Zinc	mg/kg	<4.1	4.1	06/29/11 18:04	

LABORATORY CONTROL SAMPLE: 998305

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Antimony	mg/kg	17.9	18.5	103	75-125	
Arsenic	mg/kg	17.9	19.0	106	75-125	
Barium	mg/kg	17.9	19.5	109	75-125	
Cadmium	mg/kg	17.9	19.1	107	75-125	
Chromium	mg/kg	17.9	19.5	109	75-125	
Cobalt	mg/kg	17.9	19.6	110	75-125	
Copper	mg/kg	17.9	20.1	113	75-125	
Iron	mg/kg	223	248	111	75-125	
Lead	mg/kg	17.9	19.5	109	75-125	
Manganese	mg/kg	17.9	19.8	111	75-125	
Nickel	mg/kg	17.9	20.1	113	75-125	
Zinc	mg/kg	17.9	19.7	110	75-125	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 998306 998307

Parameter	Units	10160673001 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Antimony	mg/kg	16.7	43.1	54.2	51.5	63.1	81	85	75-125	20	20	
Arsenic	mg/kg	27.9	43.1	54.2	72.3	84.9	103	105	75-125	16	20	
Barium	mg/kg	335	43.1	54.2	400	425	151	166	75-125	6	20	M6
Cadmium	mg/kg	1.4	43.1	54.2	43.5	55.7	98	100	75-125	25	20	D6
Chromium	mg/kg	8.3	43.1	54.2	60.7	70.9	122	115	75-125	15	20	

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QUALITY CONTROL DATA

Project: Black Pine Mine-REV
Pace Project No.: 10160673

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 998306 998307

Parameter	Units	10160673001 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Cobalt	mg/kg	19.3	43.1	54.2	64.4	75.4	105	103	75-125	16	20	
Copper	mg/kg	109	43.1	54.2	173	172	149	115	75-125	.7	20	M6
Iron	mg/kg	12400	539	678	15600	15500	596	454	75-125	.8	20	M6
Lead	mg/kg	74.2	43.1	54.2	140	150	154	139	75-125	6	20	M6
Manganese	mg/kg	1980	43.1	54.2	1850	1860	-295	-213	75-125	.6	20	M6
Nickel	mg/kg	11.4	43.1	54.2	60.1	71.7	113	111	75-125	18	20	
Zinc	mg/kg	144	43.1	54.2	210	219	154	138	75-125	4	20	M6

MATRIX SPIKE SAMPLE: 998308

Parameter	Units	10160673014 Result	Spike Conc.	MS Result	MS % Rec	% Rec Limits	Qualifiers
Antimony	mg/kg	16.8	32.4	32.0	47	75-125	M6
Arsenic	mg/kg	19.4	32.4	51.9	100	75-125	
Barium	mg/kg	143	32.4	248	324	75-125	M6
Cadmium	mg/kg	0.43	32.4	32.0	98	75-125	
Chromium	mg/kg	20.7	32.4	66.1	140	75-125	M6
Cobalt	mg/kg	7.6	32.4	49.0	128	75-125	
Copper	mg/kg	57.9	32.4	85.9	86	75-125	
Iron	mg/kg	22300	404	36400	3500	75-125	M6
Lead	mg/kg	207	32.4	131	-236	75-125	M6
Manganese	mg/kg	404	32.4	1300	2780	75-125	M6
Nickel	mg/kg	9.1	32.4	46.0	114	75-125	
Zinc	mg/kg	40.5	32.4	109	213	75-125	M6

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QUALITY CONTROL DATA

Project: Black Pine Mine-REV
Pace Project No.: 10160673

QC Batch: MERP/5542 Analysis Method: EPA 7471
QC Batch Method: EPA 7471 Analysis Description: 7471 Mercury
Associated Lab Samples: 10160673001, 10160673002, 10160673003, 10160673007, 10160673008, 10160673009, 10160673010, 10160673011, 10160673012, 10160673013, 10160673014

METHOD BLANK: 999060 Matrix: Solid
Associated Lab Samples: 10160673001, 10160673002, 10160673003, 10160673007, 10160673008, 10160673009, 10160673010, 10160673011, 10160673012, 10160673013, 10160673014

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Mercury	mg/kg	<0.019	0.019	06/30/11 08:35	

LABORATORY CONTROL SAMPLE: 999061

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Mercury	mg/kg	.48	0.50	104	80-120	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 999062 999063

Parameter	Units	10160673001 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Mercury	mg/kg	14.4	1.4	1.5	14.3	20.1	-9	368	80-120	34	20	D6,M6

MATRIX SPIKE SAMPLE: 999064

Parameter	Units	10160707009 Result	Spike Conc.	MS Result	MS % Rec	% Rec Limits	Qualifiers
Mercury	mg/kg	27.4	1.3	27.7	16	80-120	M6

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QUALITY CONTROL DATA

Project: Black Pine Mine-REV
Pace Project No.: 10160673

QC Batch: MPRP/26859 Analysis Method: % Moisture
QC Batch Method: % Moisture Analysis Description: Dry Weight/Percent Moisture
Associated Lab Samples: 10160673001, 10160673002, 10160673003, 10160673007, 10160673008, 10160673009, 10160673010

SAMPLE DUPLICATE: 1002964

Parameter	Units	10160828002 Result	Dup Result	RPD	Max RPD	Qualifiers
Percent Moisture	%	16.6	16.7	.1	30	

SAMPLE DUPLICATE: 1002965

Parameter	Units	10160673010 Result	Dup Result	RPD	Max RPD	Qualifiers
Percent Moisture	%	36.5	40.6	11	30	

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QUALITY CONTROL DATA

Project: Black Pine Mine-REV
Pace Project No.: 10160673

QC Batch: MPRP/26864 Analysis Method: % Moisture
QC Batch Method: % Moisture Analysis Description: Dry Weight/Percent Moisture
Associated Lab Samples: 10160673011, 10160673012, 10160673013, 10160673014

SAMPLE DUPLICATE: 1003029

Parameter	Units	10160673011 Result	Dup Result	RPD	Max RPD	Qualifiers
Percent Moisture	%	21.0	21.1	.5	30	

SAMPLE DUPLICATE: 1003030

Parameter	Units	10160756011 Result	Dup Result	RPD	Max RPD	Qualifiers
Percent Moisture	%	31.0	34.4	10	30	

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QUALITY CONTROL DATA

Project: Black Pine Mine-REV
Pace Project No.: 10160673

QC Batch: MT/6228 Analysis Method: SM 2310
QC Batch Method: SM 2310 Analysis Description: 2310 Acidity
Associated Lab Samples: 10160673004, 10160673005, 10160673006

METHOD BLANK: 1000993 Matrix: Water
Associated Lab Samples: 10160673004, 10160673005, 10160673006

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Acidity	mg/L	<5.0	5.0	06/24/11 16:00	

SAMPLE DUPLICATE: 1000995

Parameter	Units	10160655003 Result	Dup Result	RPD	Max RPD	Qualifiers
Acidity	mg/L	16.7	16.7	0	20	

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QUALITY CONTROL DATA

Project: Black Pine Mine-REV
Pace Project No.: 10160673

QC Batch: MT/6192 Analysis Method: SM 2540D
QC Batch Method: SM 2540D Analysis Description: 2540D Total Suspended Solids
Associated Lab Samples: 10160673004, 10160673005, 10160673006

METHOD BLANK: 998564 Matrix: Water
Associated Lab Samples: 10160673004, 10160673005, 10160673006

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Total Suspended Solids	mg/L	<1.0	1.0	06/20/11 10:40	

LABORATORY CONTROL SAMPLE: 998563

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Total Suspended Solids	mg/L	25	25.0	100	71-129	

SAMPLE DUPLICATE: 998919

Parameter	Units	10160673006 Result	Dup Result	RPD	Max RPD	Qualifiers
Total Suspended Solids	mg/L	<2.0	<2.0		20	

SAMPLE DUPLICATE: 998920

Parameter	Units	10160655005 Result	Dup Result	RPD	Max RPD	Qualifiers
Total Suspended Solids	mg/L	<2.0	2.2		20	

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QUALITY CONTROL DATA

Project: Black Pine Mine-REV
Pace Project No.: 10160673

QC Batch: MT/6195 Analysis Method: EPA 300.0
QC Batch Method: EPA 300.0 Analysis Description: 300.0 IC Anions
Associated Lab Samples: 10160673004, 10160673005, 10160673006

METHOD BLANK: 998638 Matrix: Water
Associated Lab Samples: 10160673004, 10160673005, 10160673006

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Sulfate	mg/L	<1.0	1.0	06/23/11 22:15	

LABORATORY CONTROL SAMPLE: 998639

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Sulfate	mg/L	20	19.5	98	90-110	

MATRIX SPIKE SAMPLE: 998640

Parameter	Units	10160067001 Result	Spike Conc.	MS Result	MS % Rec	% Rec Limits	Qualifiers
Sulfate	mg/L	12.5	20	32.2	99	80-120	

MATRIX SPIKE SAMPLE: 998642

Parameter	Units	10160709001 Result	Spike Conc.	MS Result	MS % Rec	% Rec Limits	Qualifiers
Sulfate	mg/L	4110	4000	8170	101	80-120	

SAMPLE DUPLICATE: 998641

Parameter	Units	10160067002 Result	Dup Result	RPD	Max RPD	Qualifiers
Sulfate	mg/L	14.1	18.4	26	20	D6

SAMPLE DUPLICATE: 998643

Parameter	Units	10160709002 Result	Dup Result	RPD	Max RPD	Qualifiers
Sulfate	mg/L	5330	5370	.6	20	

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QUALITY CONTROL DATA

Project: Black Pine Mine-REV
Pace Project No.: 10160673

QC Batch: WET/22674 Analysis Method: SM 2320B
QC Batch Method: SM 2320B Analysis Description: 2320B Alkalinity
Associated Lab Samples: 10160673004, 10160673005, 10160673006

METHOD BLANK: 998338 Matrix: Water
Associated Lab Samples: 10160673004, 10160673005, 10160673006

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Alkalinity, Total as CaCO3	mg/L	<5.0	5.0	06/20/11 11:16	

LABORATORY CONTROL SAMPLE & LCSD: 998339 998340

Parameter	Units	Spike Conc.	LCS Result	LCSD Result	LCS % Rec	LCSD % Rec	% Rec Limits	RPD	Max RPD	Qualifiers
Alkalinity, Total as CaCO3	mg/L	40	39.0	39.7	98	99	90-110	2	30	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 998341 998342

Parameter	Units	10160707001 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Alkalinity, Total as CaCO3	mg/L	13.4	40	40	53.2	53.8	99	101	80-120	1	30	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 998343 998344

Parameter	Units	10160722002 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Alkalinity, Total as CaCO3	mg/L	232	40	40	281	283	124	127	80-120	.4	30	M1

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QUALITY CONTROL DATA

Project: Black Pine Mine-REV
Pace Project No.: 10160673

QC Batch: WET/22678 Analysis Method: SM 2540C
QC Batch Method: SM 2540C Analysis Description: 2540C Total Dissolved Solids
Associated Lab Samples: 10160673004, 10160673005, 10160673006

METHOD BLANK: 998440 Matrix: Water
Associated Lab Samples: 10160673004, 10160673005, 10160673006

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Total Dissolved Solids	mg/L	<10.0	10.0	06/20/11 12:01	

LABORATORY CONTROL SAMPLE: 998441

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Total Dissolved Solids	mg/L	1000	982	98	80-120	

SAMPLE DUPLICATE: 998442

Parameter	Units	10160707001 Result	Dup Result	RPD	Max RPD	Qualifiers
Total Dissolved Solids	mg/L	125	115	8	20	

SAMPLE DUPLICATE: 998443

Parameter	Units	10160655002 Result	Dup Result	RPD	Max RPD	Qualifiers
Total Dissolved Solids	mg/L	103	94.0	9	20	

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QUALIFIERS

Project: Black Pine Mine-REV
Pace Project No.: 10160673

DEFINITIONS

DF - Dilution Factor, if reported, represents the factor applied to the reported data due to changes in sample preparation, dilution of the sample aliquot, or moisture content.

ND - Not Detected at or above adjusted reporting limit.

J - Estimated concentration above the adjusted method detection limit and below the adjusted reporting limit.

MDL - Adjusted Method Detection Limit.

S - Surrogate

1,2-Diphenylhydrazine (8270 listed analyte) decomposes to Azobenzene.

Consistent with EPA guidelines, unrounded data are displayed and have been used to calculate % recovery and RPD values.

LCS(D) - Laboratory Control Sample (Duplicate)

MS(D) - Matrix Spike (Duplicate)

DUP - Sample Duplicate

RPD - Relative Percent Difference

NC - Not Calculable.

SG - Silica Gel - Clean-Up

U - Indicates the compound was analyzed for, but not detected.

N-Nitrosodiphenylamine decomposes and cannot be separated from Diphenylamine using Method 8270. The result reported for each analyte is a combined concentration.

LABORATORIES

PASI-M	Pace Analytical Services - Minneapolis
PASI-MT	Pace Analytical Services - Montana

ANALYTE QUALIFIERS

D6	The relative percent difference (RPD) between the sample and sample duplicate exceeded laboratory control limits.
M1	Matrix spike recovery exceeded QC limits. Batch accepted based on laboratory control sample (LCS) recovery.
M6	Matrix spike and Matrix spike duplicate recovery not evaluated against control limits due to sample dilution.

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QUALITY CONTROL DATA CROSS REFERENCE TABLE

Project: Black Pine Mine-REV
Pace Project No.: 10160673

Lab ID	Sample ID	QC Batch Method	QC Batch	Analytical Method	Analytical Batch
10160673004	**TSP-6**	EPA 200.8	MPRP/26726	EPA 200.8	ICPM/10928
10160673005	**CML-SW-17**	EPA 200.8	MPRP/26726	EPA 200.8	ICPM/10928
10160673006	**CML-SW-18**	EPA 200.8	MPRP/26726	EPA 200.8	ICPM/10928
10160673001	**BP-CML-SD-04-00**	EPA 3050	MPRP/26729	EPA 6020	ICPM/10930
10160673002	**BP-CML-SD-05-00**	EPA 3050	MPRP/26729	EPA 6020	ICPM/10930
10160673003	**BP-CML-SD-03-00**	EPA 3050	MPRP/26729	EPA 6020	ICPM/10930
10160673007	**CML-SD-09**	EPA 3050	MPRP/26729	EPA 6020	ICPM/10930
10160673008	**CML-SD-10**	EPA 3050	MPRP/26729	EPA 6020	ICPM/10930
10160673009	**CML-SD-07**	EPA 3050	MPRP/26729	EPA 6020	ICPM/10930
10160673010	**CML-SD-08**	EPA 3050	MPRP/26729	EPA 6020	ICPM/10930
10160673011	**CML-SD-11**	EPA 3050	MPRP/26729	EPA 6020	ICPM/10930
10160673012	**CML-SD-01**	EPA 3050	MPRP/26729	EPA 6020	ICPM/10930
10160673013	**CML-SD-02**	EPA 3050	MPRP/26729	EPA 6020	ICPM/10930
10160673014	**BP-CML-SD-03-00**	EPA 3050	MPRP/26729	EPA 6020	ICPM/10930
10160673001	**BP-CML-SD-04-00**	EPA 7471	MERP/5542	EPA 7471	MERC/6387
10160673002	**BP-CML-SD-05-00**	EPA 7471	MERP/5542	EPA 7471	MERC/6387
10160673003	**BP-CML-SD-03-00**	EPA 7471	MERP/5542	EPA 7471	MERC/6387
10160673007	**CML-SD-09**	EPA 7471	MERP/5542	EPA 7471	MERC/6387
10160673008	**CML-SD-10**	EPA 7471	MERP/5542	EPA 7471	MERC/6387
10160673009	**CML-SD-07**	EPA 7471	MERP/5542	EPA 7471	MERC/6387
10160673010	**CML-SD-08**	EPA 7471	MERP/5542	EPA 7471	MERC/6387
10160673011	**CML-SD-11**	EPA 7471	MERP/5542	EPA 7471	MERC/6387
10160673012	**CML-SD-01**	EPA 7471	MERP/5542	EPA 7471	MERC/6387
10160673013	**CML-SD-02**	EPA 7471	MERP/5542	EPA 7471	MERC/6387
10160673014	**BP-CML-SD-03-00**	EPA 7471	MERP/5542	EPA 7471	MERC/6387
10160673001	**BP-CML-SD-04-00**	% Moisture	MPRP/26859		
10160673002	**BP-CML-SD-05-00**	% Moisture	MPRP/26859		
10160673003	**BP-CML-SD-03-00**	% Moisture	MPRP/26859		
10160673007	**CML-SD-09**	% Moisture	MPRP/26859		
10160673008	**CML-SD-10**	% Moisture	MPRP/26859		
10160673009	**CML-SD-07**	% Moisture	MPRP/26859		
10160673010	**CML-SD-08**	% Moisture	MPRP/26859		
10160673011	**CML-SD-11**	% Moisture	MPRP/26864		
10160673012	**CML-SD-01**	% Moisture	MPRP/26864		
10160673013	**CML-SD-02**	% Moisture	MPRP/26864		
10160673014	**BP-CML-SD-03-00**	% Moisture	MPRP/26864		
10160673004	**TSP-6**	SM 2310	MT/6228		
10160673005	**CML-SW-17**	SM 2310	MT/6228		
10160673006	**CML-SW-18**	SM 2310	MT/6228		
10160673004	**TSP-6**	SM 2540D	MT/6192		
10160673005	**CML-SW-17**	SM 2540D	MT/6192		
10160673006	**CML-SW-18**	SM 2540D	MT/6192		
10160673004	**TSP-6**	EPA 300.0	MT/6195		
10160673005	**CML-SW-17**	EPA 300.0	MT/6195		
10160673006	**CML-SW-18**	EPA 300.0	MT/6195		

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QUALITY CONTROL DATA CROSS REFERENCE TABLE

Project: Black Pine Mine-REV
Pace Project No.: 10160673

Lab ID	Sample ID	QC Batch Method	QC Batch	Analytical Method	Analytical Batch
10160673004	**TSP-6**	SM 2320B	WET/22674		
10160673005	**CML-SW-17**	SM 2320B	WET/22674		
10160673006	**CML-SW-18**	SM 2320B	WET/22674		
10160673004	**TSP-6**	SM 2540C	WET/22678		
10160673005	**CML-SW-17**	SM 2540C	WET/22678		
10160673006	**CML-SW-18**	SM 2540C	WET/22678		

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CHAIN-OF-CUSTODY / Analytical Request Document

The Chain-of-Custody is a LEGAL DOCUMENT. All relevant fields must be completed accurately.

Page: 1 of 2

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Section A Required Client Information:	Section B Required Project Information:	Section C Invoice Information:
Company: Herrera	Report To: Kevin Houck	Attention:
Address:	Copy To:	Company Name: DEQ
		Address:
Email To:	Purchase Order No.:	Pace Quote Reference:
Phone: Fax:	Project Name: Black Pine Mine	Pace Project Manager:
Requested Due Date/TAT:	Project Number:	Pace Profile #:

REGULATORY AGENCY

☐ NPDES ☐ GROUND WATER ☐ DRINKING WATER

☐ UST ☐ RCRA ☐ OTHER _____

Site Location STATE: _____

Section D Required Client Information

SAMPLE ID
(A-Z, 0-9 / ,-)
Sample IDs MUST BE UNIQUE

Matrix Codes — MATRIX / CODE
Drinking Water DW
Water WT
Waste Water WW
Product P
Soil/Solid SL
Oil OL
Wipe WP
Air AR
Tissue TS
Other OT

Requested Analysis Filtered (Y/N)

ITEM #	SAMPLE ID	MATRIX CODE (see valid codes to left)	SAMPLE TYPE (G=GRAB C=COMP)	COLLECTED COMPOSITE START DATE	COLLECTED COMPOSITE START TIME	COLLECTED COMPOSITE END/GRAB DATE	COLLECTED COMPOSITE END/GRAB TIME	SAMPLE TEMP AT COLLECTION	# OF CONTAINERS	Preservatives: Unpreserved	H_2SO_4	HNO_3	HCl	NaOH	$Na_2S_2O_3$	Methanol	Other	Analysis Test Y/N	TSS	Alk; TDS Acidity, sulfate	Total Metals	Total Metals (solid)	Residual Chlorine (Y/N)	Pace Project No./ Lab I.D.
																			N	M	M	Y	N		10160673
1	BP-CML-SD-04-00	S	G			6/14/11	1630		1	X													X		-001
2	BP-CML-SD-05-00	S	G				1425		1	X													X		-002
3	BP-CML-SD-03-00	S	G				1355		1	X													X		-003
4	TSP-6	W	G				1350		4	X		X							X	X	X	X			-004
5	CML-SW-17	↓	↓				1745		4	X		X							X	X	X	X			-005
6	CML-SW-18	↓	↓				1420		4	X		X							X	X	X	X			-006
7	CML-SD-09	S	G				1500		1	X													X		-007
8	CML-SD-10	↓	↓				1645		1	X													X		-008
9	CML-SD-07	↓	↓				1010		1	X													X		-009
10	CML-SD-08	↓	↓				1515		1	X													X		-010
11	CML-SD-11	↓	↓				1800		1	X													X		-011
12	CML-SD-01	↓	↓			↓	1323		1	X													X		-012

ADDITIONAL COMMENTS	RELINQUISHED BY / AFFILIATION	DATE	TIME	ACCEPTED BY / AFFILIATION	DATE	TIME	SAMPLE CONDITIONS			
	Gina Catarra/Herrera	6/15/11	10:15				20	5	5	5
	Fedex	6/17/11	0850	Norma C. Trankley/Pace for Ray Varley	6/17/11	0850				

ORIGINAL

SAMPLER NAME AND SIGNATURE

PRINT Name of SAMPLER: Gina Catarra

SIGNATURE of SAMPLER: [signature] DATE Signed (MM/DD/YY): 6/15/11

Temp in °C | Received on Ice (Y/N) | Custody Sealed Cooler (Y/N) | Samples Intact (Y/N)

*Important Note: By signing this form you are accepting Pace's NET 30 day payment terms and agreeing to late charges of 1.5% per month for any invoices not paid within 30 days.

F-ALL-Q-020rev.07, 15-May-2007

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Page: 2 of 2

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Section A Required Client Information:	Section B Required Project Information:	Section C Invoice Information:
Company: Herrera	Report To: Kevin Houck	Attention:
Address:	Copy To:	Company Name: DEQ
		Address:
Email To:	Purchase Order No.:	Pace Quote Reference:
Phone: Fax:	Project Name: Black Pine Mine	Pace Project Manager:
Requested Due Date/TAT:	Project Number:	Pace Profile #:

REGULATORY AGENCY

☐ NPDES ☐ GROUND WATER ☐ DRINKING WATER

☐ UST ☐ RCRA ☐ OTHER _____

Site Location STATE: _____

Requested Analysis Filtered (Y/N)

ITEM #	Section D Required Client Information — SAMPLE ID (A-Z, 0-9 / ,-) Sample IDs MUST BE UNIQUE	Matrix Codes MATRIX / CODE: Drinking Water DW, Water WT, Waste Water WW, Product P, Soil/Solid SL, Oil OL, Wipe WP, Air AR, Tissue TS, Other OT	MATRIX CODE (see valid codes to left)	SAMPLE TYPE (G=GRAB C=COMP)	COLLECTED: COMPOSITE START DATE	COMPOSITE START TIME	COMPOSITE END/GRAB DATE	COMPOSITE END/GRAB TIME	SAMPLE TEMP AT COLLECTION	# OF CONTAINERS	Preservatives: Unpreserved	H_2SO_4	HNO_3	HCl	NaOH	$Na_2S_2O_3$	Methanol	Other	Analysis Test ↓ Y/N	TSS	TDS	Acidity (sulfuric)	Total Metals (solid)	Residual Chlorine (Y/N)	Pace Project No./ Lab I.D.
1	CML-SD-02		S	G	6/15		6/15/11	0920		1	X								N	X			X			10160673 -013
2	BP-CML-SD-03-00		S	G			↓	0825		1	X								N	X			X			-014
3																										
4																										
5																										
6																										
7																										
8																										
9																										
10																										
11																										
12																										

ADDITIONAL COMMENTS	RELINQUISHED BY / AFFILIATION	DATE	TIME	ACCEPTED BY / AFFILIATION	DATE	TIME	SAMPLE CONDITIONS
	Gina Catarra/Herrera	6/15/11	10:15				
	Fedex	6/17/11	0850	Norma C. Frankle/Pace for Ray Varley	6/17/11	0850	
							2.0 / Y / Y / Y

Temp in °C | Received on Ice (Y/N) | Custody Sealed Cooler (Y/N) | Samples Intact (Y/N)

ORIGINAL

SAMPLER NAME AND SIGNATURE

PRINT Name of SAMPLER: Gina Catarra

SIGNATURE of SAMPLER: [signature] DATE Signed (MM/DD/YY): 6/15/11

*Important Note: By signing this form you are accepting Pace's NET 30 day payment terms and agreeing to late charges of 1.5% per month for any invoices not paid within 30 days.

Sample Condition Upon Receipt

Pace Analytical

Client Name: Hess/ery Env Project # 10160613

Courier: [X] Fed Ex [ ] UPS [ ] USPS [ ] Client [ ] Commercial [ ] Pace Other ________

Tracking #: 8297184 6001 7271

Custody Seal on Cooler/Box Present: [X] yes [ ] no Seals intact: [X] yes [ ] no

Packing Material: [ ] Bubble Wrap [X] Bubble Bags [ ] None [ ] Other ________ Temp Blank: Yes ✓ No ______

Thermometer Used: (1383045 or 135) Type of Ice: (Wet) Blue None [X] Samples on ice, cooling process has begun

Cooler Temperature: 2.0 Biological Tissue Is Frozen: Yes No

Temp should be above freezing to 6°C

Date and Initials of person examining contents: MG 6/1/14

Comments:

				Comments
Chain of Custody Present:	[X] Yes	[ ] No	[ ] N/A	1.
Chain of Custody Filled Out:	[X] Yes	[ ] No	[ ] N/A	2.
Chain of Custody Relinquished:	[X] Yes	[ ] No	[ ] N/A	3.
Sampler Name & Signature on COC:	[X] Yes	[ ] No	[ ] N/A	4.
Samples Arrived within Hold Time:	[X] Yes	[ ] No	[ ] N/A	5.
Short Hold Time Analysis (<72hr):	[ ] Yes	[X] No	[X] N/A	6.
Rush Turn Around Time Requested:	[ ] Yes	[X] No	[ ] N/A	7.
Sufficient Volume:	[X] Yes	[ ] No	[ ] N/A	8.
Correct Containers Used:	[X] Yes	[ ] No	[ ] N/A	9.
-Pace Containers Used:	[X] Yes	[ ] No	[ ] N/A	
Containers Intact:	[X] Yes	[ ] No	[ ] N/A	10.
Filtered volume received for Dissolved tests	[ ] Yes	[ ] No	[X] N/A	11.
Sample Labels match COC: -Includes date/time/ID/Analysis Matrix: water	[ ] Yes	[X] No	[ ] N/A	12. 003-BP-15-5000 date+time lack
All containers needing acid/base preservation have been checked. Noncompliance are noted in 13.	[X] Yes	[ ] No	[ ] N/A	13. [X] HNO3 [ ] H2SO4 [ ] NaOH [ ] HCl Samp # 1-3
All containers needing preservation are found to be in compliance with EPA recommendation.	[X] Yes	[ ] No	[ ] N/A	
Exceptions: VOA,Coliform, TOC, Oil and Grease, WI-DRO (water)	[ ] Yes	[X] No		Initial when completed / Lot # of added preservative
Samples checked for dechlorination:	[ ] Yes	[ ] No	[X] N/A	14.
Headspace in VOA Vials (>6mm):	[ ] Yes	[ ] No	[X] N/A	15.
Trip Blank Present:	[ ] Yes	[ ] No	[X] N/A	16.
Trip Blank Custody Seals Present	[ ] Yes	[ ] No	[X] N/A	
Pace Trip Blank Lot # (if purchased):________				

Client Notification/ Resolution: Field Data Required? Y / N

Person Contacted: ________________ Date/Time: ________

Comments/ Resolution: ________________

Project Manager Review: [signature] **Date:** 6-1-14

Note: Whenever there is a discrepancy affecting North Carolina compliance samples, a copy of this form will be sent to the North Carolina DEHNR Certification Office (i.e out of hold, incorrect preservative, out of temp, incorrect containers)

Pace Analytical Services, Inc.
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(406)254-7226

October 11, 2011

Kevin Houck
Herrera Environmental Consultants
101 East Broadway, Suite 610
Missoula, MT 59802

RE: Project: Black Pine Mine REV
Pace Project No.: 10160707

Dear Kevin Houck:
Enclosed are the analytical results for sample(s) received by the laboratory on June 17, 2011. The results relate only to the samples included in this report.

REVISION-add hardness to samples TSP-8 and MCSP-1

REVISION-add Co and delete Ag from soil samples.

If you have any questions concerning this report, please feel free to contact me.

Sincerely,

Carol Davy

carol.davy@pacelabs.com
Project Manager

Enclosures

cc: Devin Clary, Montana Dept. of Environmental Quality
Mark Donner, Trihydro
Jamie Mongoven, Montana Dept. of Environmental

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CERTIFICATIONS

Project: Black Pine Mine REV
Pace Project No.: 10160707

Minnesota Certification IDs

1700 Elm Street SE Suite 200, Minneapolis, MN 55414
A2LA Certification #: 2926.01
Alaska Certification #: UST-078
Alaska Certification #MN00064
Arizona Certification #: AZ-0014
Arkansas Certification #: 88-0680
California Certification #: 01155CA
EPA Region 8 Certification #: Pace
Florida/NELAP Certification #: E87605
Georgia Certification #: 959
Idaho Certification #: MN00064
Illinois Certification #: 200011
Iowa Certification #: 368
Kansas Certification #: E-10167
Louisiana Certification #: 03086
Louisiana Certification #: LA080009
Maine Certification #: 2007029
Maryland Certification #: 322
Michigan DEQ Certification #: 9909
Minnesota Certification #: 027-053-137
Mississippi Certification #: Pace
Montana Certification #: MT CERT0092
Nebraska Certification #: Pace
Nevada Certification #: MN_00064
New Jersey Certification #: MN-002
New Mexico Certification #: Pace
New York Certification #: 11647
North Carolina Certification #: 530
North Dakota Certification #: R-036
North Dakota Certification #: R-036A
Ohio VAP Certification #: CL101
Oklahoma Certification #: D9921
Oklahoma Certification #: 9507
Oregon Certification #: MN200001
Pennsylvania Certification #: 68-00563
Puerto Rico Certification
Tennessee Certification #: 02818
Texas Certification #: T104704192
Washington Certification #: C754
Wisconsin Certification #: 999407970

Montana Certification IDs

602 South 25th Street, Billings, MT 59101
EPA Region 8 Certification #: 8TMS-Q
Idaho Certification #: MT00012
Montana Certification #: MT CERT0040
NVLAP Certification #: 101292-0
Minnesota Dept of Health Certification #: 030-999-442

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SAMPLE SUMMARY

Project: Black Pine Mine REV
Pace Project No.: 10160707

Lab ID	Sample ID	Matrix	Date Collected	Date Received
10160707001	**TSP-8**	Water	06/13/11 16:45	06/17/11 08:50
10160707002	**BP-TS-SD-01-00**	Solid	06/13/11 16:55	06/17/11 08:50
10160707003	**CML-SW-06**	Water	06/13/11 16:30	06/17/11 08:50
10160707004	**CML-SD-06-00**	Solid	06/13/11 16:35	06/17/11 08:50
10160707005	**TSP-3**	Water	06/13/11 15:30	06/17/11 08:50
10160707006	**BP-TS-SD-02-00**	Solid	06/13/11 15:40	06/17/11 08:50
10160707007	**TSP-9**	Water	06/13/11 17:30	06/17/11 08:50
10160707008	**MCSP-1**	Water	06/13/11 14:40	06/17/11 08:50
10160707009	**HM-SD-01**	Solid	06/13/11 14:45	06/17/11 08:50

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SAMPLE ANALYTE COUNT

Project: Black Pine Mine REV
Pace Project No.: 10160707

Lab ID	Sample ID	Method	Analysts	Analytes Reported	Laboratory
10160707001	**TSP-8**	EPA 200.8	CJS, TL1	13	PASI-M
		SM 2310	CAC	1	PASI-MT
		SM 2540D	SR1	1	PASI-MT
		EPA 300.0	JH1	1	PASI-MT
		SM 2320B	MWD	1	PASI-M
		SM 2540C	PH1	1	PASI-M
10160707002	**BP-TS-SD-01-00**	EPA 6020	CJS, RJS	12	PASI-M
		EPA 7471	TEM	1	PASI-M
		% Moisture	JDL	1	PASI-M
10160707003	**CML-SW-06**	EPA 200.8	CJS, TL1	12	PASI-M
		SM 2310	CAC	1	PASI-MT
		SM 2540D	SR1	1	PASI-MT
		EPA 300.0	JH1	1	PASI-MT
		SM 2320B	MWD	1	PASI-M
		SM 2540C	PH1	1	PASI-M
10160707004	**CML-SD-06-00**	EPA 6020	CJS, RJS	12	PASI-M
		EPA 7471	TEM	1	PASI-M
		% Moisture	JDL	1	PASI-M
10160707005	**TSP-3**	EPA 200.8	CJS, TL1	12	PASI-M
		SM 2310	CAC	1	PASI-MT
		SM 2540D	SR1	1	PASI-MT
		EPA 300.0	JH1	1	PASI-MT
		SM 2320B	MWD	1	PASI-M
		SM 2540C	PH1	1	PASI-M
10160707006	**BP-TS-SD-02-00**	EPA 6020	CJS, RJS	12	PASI-M
		EPA 7471	TEM	1	PASI-M
		% Moisture	JDL	1	PASI-M
10160707007	**TSP-9**	EPA 200.8	CJS, TL1	12	PASI-M
		SM 2310	CAC	1	PASI-MT
		SM 2540D	SR1	1	PASI-MT
		EPA 300.0	JH1	1	PASI-MT
		SM 2320B	MWD	1	PASI-M
		SM 2540C	PH1	1	PASI-M
10160707008	**MCSP-1**	EPA 200.8	CJS, TL1	13	PASI-M
		SM 2310	CAC	1	PASI-MT
		SM 2540D	SR1	1	PASI-MT
		EPA 300.0	JH1	1	PASI-MT

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SAMPLE ANALYTE COUNT

Project: Black Pine Mine REV
Pace Project No.: 10160707

Lab ID	Sample ID	Method	Analysts	Analytes Reported	Laboratory
		SM 2320B	MWD	1	PASI-M
		SM 2540C	PH1	1	PASI-M
10160707009	**HM-SD-01**	EPA 6020	CJS, RJS	12	PASI-M
		EPA 7471	TEM	1	PASI-M
		% Moisture	JDL	1	PASI-M

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PROJECT NARRATIVE

Project: Black Pine Mine REV
Pace Project No.: 10160707

Method: **EPA 200.8**
Description: 200.8 MET ICPMS
Client: Montana Dept. of Environmental Quality
Date: October 11, 2011

General Information:
5 samples were analyzed for EPA 200.8. All samples were received in acceptable condition with any exceptions noted below.

Hold Time:
The samples were analyzed within the method required hold times with any exceptions noted below.

Sample Preparation:
The samples were prepared in accordance with EPA 200.8 with any exceptions noted below.

Initial Calibrations (including MS Tune as applicable):
All criteria were within method requirements with any exceptions noted below.

Continuing Calibration:
All criteria were within method requirements with any exceptions noted below.

Internal Standards:
All internal standards were within QC limits with any exceptions noted below.

Method Blank:
All analytes were below the report limit in the method blank with any exceptions noted below.

Laboratory Control Spike:
All laboratory control spike compounds were within QC limits with any exceptions noted below.

Matrix Spikes:
All percent recoveries and relative percent differences (RPDs) were within acceptance criteria with any exceptions noted below.

QC Batch: MPRP/26726

A matrix spike and matrix spike duplicate (MS/MSD) were performed on the following sample(s): 10160655001,10160673004

M1: Matrix spike recovery exceeded QC limits. Batch accepted based on laboratory control sample (LCS) recovery.

- MS (Lab ID: 998292)
  - Iron
- MS (Lab ID: 998294)
  - Iron
- MSD (Lab ID: 998293)
  - Iron

Duplicate Sample:
All duplicate sample results were within method acceptance criteria with any exceptions noted below.

Additional Comments:

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PROJECT NARRATIVE

Project: Black Pine Mine REV
Pace Project No.: 10160707

Method: **EPA 6020**
Description: 6020 MET ICPMS
Client: Montana Dept. of Environmental Quality
Date: October 11, 2011

General Information:
4 samples were analyzed for EPA 6020. All samples were received in acceptable condition with any exceptions noted below.

Hold Time:
The samples were analyzed within the method required hold times with any exceptions noted below.

Sample Preparation:
The samples were prepared in accordance with EPA 3050 with any exceptions noted below.

Initial Calibrations (including MS Tune as applicable):
All criteria were within method requirements with any exceptions noted below.

Continuing Calibration:
All criteria were within method requirements with any exceptions noted below.

Internal Standards:
All internal standards were within QC limits with any exceptions noted below.

Method Blank:
All analytes were below the report limit in the method blank with any exceptions noted below.

Laboratory Control Spike:
All laboratory control spike compounds were within QC limits with any exceptions noted below.

Matrix Spikes:
All percent recoveries and relative percent differences (RPDs) were within acceptance criteria with any exceptions noted below.

QC Batch: MPRP/26729

A matrix spike and matrix spike duplicate (MS/MSD) were performed on the following sample(s): 10160673001,10160673014

M6: Matrix spike and Matrix spike duplicate recovery not evaluated against control limits due to sample dilution.

- MS (Lab ID: 998306)
  - Barium
  - Copper
  - Iron
  - Lead
  - Manganese
  - Zinc
- MS (Lab ID: 998308)
  - Antimony
  - Barium
  - Chromium
  - Iron
  - Lead
  - Manganese

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PROJECT NARRATIVE

Project: Black Pine Mine REV
Pace Project No.: 10160707

Method: **EPA 6020**
Description: 6020 MET ICPMS
Client: Montana Dept. of Environmental Quality
Date: October 11, 2011

QC Batch: MPRP/26729

A matrix spike and matrix spike duplicate (MS/MSD) were performed on the following sample(s): 10160673001,10160673014

M6: Matrix spike and Matrix spike duplicate recovery not evaluated against control limits due to sample dilution.

- Zinc

- MSD (Lab ID: 998307)
  - Barium
  - Iron
  - Lead
  - Manganese
  - Zinc

Duplicate Sample:
All duplicate sample results were within method acceptance criteria with any exceptions noted below.

Additional Comments:

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PROJECT NARRATIVE

Project: Black Pine Mine REV
Pace Project No.: 10160707

Method: **EPA 7471**
Description: 7471 Mercury
Client: Montana Dept. of Environmental Quality
Date: October 11, 2011

General Information:
4 samples were analyzed for EPA 7471. All samples were received in acceptable condition with any exceptions noted below.

Hold Time:
The samples were analyzed within the method required hold times with any exceptions noted below.

Sample Preparation:
The samples were prepared in accordance with EPA 7471 with any exceptions noted below.

Initial Calibrations (including MS Tune as applicable):
All criteria were within method requirements with any exceptions noted below.

Continuing Calibration:
All criteria were within method requirements with any exceptions noted below.

Method Blank:
All analytes were below the report limit in the method blank with any exceptions noted below.

Laboratory Control Spike:
All laboratory control spike compounds were within QC limits with any exceptions noted below.

Matrix Spikes:
All percent recoveries and relative percent differences (RPDs) were within acceptance criteria with any exceptions noted below.

QC Batch: MERP/5542

A matrix spike and matrix spike duplicate (MS/MSD) were performed on the following sample(s): 10160673001,10160707009

M6: Matrix spike and Matrix spike duplicate recovery not evaluated against control limits due to sample dilution.

- MS (Lab ID: 999062)
  - Mercury
- MS (Lab ID: 999064)
  - Mercury
- MSD (Lab ID: 999063)
  - Mercury

Duplicate Sample:
All duplicate sample results were within method acceptance criteria with any exceptions noted below.

Additional Comments:

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PROJECT NARRATIVE

Project: Black Pine Mine REV
Pace Project No.: 10160707

Method: **SM 2310**
Description: 2310 Acidity
Client: Montana Dept. of Environmental Quality
Date: October 11, 2011

General Information:
5 samples were analyzed for SM 2310. All samples were received in acceptable condition with any exceptions noted below.

Hold Time:
The samples were analyzed within the method required hold times with any exceptions noted below.

Initial Calibrations (including MS Tune as applicable):
All criteria were within method requirements with any exceptions noted below.

Continuing Calibration:
All criteria were within method requirements with any exceptions noted below.

Internal Standards:
All internal standards were within QC limits with any exceptions noted below.

Surrogates:
All surrogates were within QC limits with any exceptions noted below.

Method Blank:
All analytes were below the report limit in the method blank with any exceptions noted below.

Laboratory Control Spike:
All laboratory control spike compounds were within QC limits with any exceptions noted below.

Matrix Spikes:
All percent recoveries and relative percent differences (RPDs) were within acceptance criteria with any exceptions noted below.

Duplicate Sample:
All duplicate sample results were within method acceptance criteria with any exceptions noted below.

Additional Comments:

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PROJECT NARRATIVE

Project: Black Pine Mine REV
Pace Project No.: 10160707

Method: **SM 2540D**
Description: 2540D Total Suspended Solids
Client: Montana Dept. of Environmental Quality
Date: October 11, 2011

General Information:
5 samples were analyzed for SM 2540D. All samples were received in acceptable condition with any exceptions noted below.

Hold Time:
The samples were analyzed within the method required hold times with any exceptions noted below.

Initial Calibrations (including MS Tune as applicable):
All criteria were within method requirements with any exceptions noted below.

Continuing Calibration:
All criteria were within method requirements with any exceptions noted below.

Internal Standards:
All internal standards were within QC limits with any exceptions noted below.

Surrogates:
All surrogates were within QC limits with any exceptions noted below.

Method Blank:
All analytes were below the report limit in the method blank with any exceptions noted below.

Laboratory Control Spike:
All laboratory control spike compounds were within QC limits with any exceptions noted below.

Matrix Spikes:
All percent recoveries and relative percent differences (RPDs) were within acceptance criteria with any exceptions noted below.

Duplicate Sample:
All duplicate sample results were within method acceptance criteria with any exceptions noted below.

Additional Comments:

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PROJECT NARRATIVE

Project: Black Pine Mine REV
Pace Project No.: 10160707

Method: **EPA 300.0**
Description: 300.0 IC Anions
Client: Montana Dept. of Environmental Quality
Date: October 11, 2011

General Information:
5 samples were analyzed for EPA 300.0. All samples were received in acceptable condition with any exceptions noted below.

Hold Time:
The samples were analyzed within the method required hold times with any exceptions noted below.

Initial Calibrations (including MS Tune as applicable):
All criteria were within method requirements with any exceptions noted below.

Continuing Calibration:
All criteria were within method requirements with any exceptions noted below.

Internal Standards:
All internal standards were within QC limits with any exceptions noted below.

Surrogates:
All surrogates were within QC limits with any exceptions noted below.

Method Blank:
All analytes were below the report limit in the method blank with any exceptions noted below.

Laboratory Control Spike:
All laboratory control spike compounds were within QC limits with any exceptions noted below.

Matrix Spikes:
All percent recoveries and relative percent differences (RPDs) were within acceptance criteria with any exceptions noted below.

Duplicate Sample:
All duplicate sample results were within method acceptance criteria with any exceptions noted below.

Additional Comments:

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PROJECT NARRATIVE

Project: Black Pine Mine REV
Pace Project No.: 10160707

Method: **SM 2320B**
Description: 2320B Alkalinity
Client: Montana Dept. of Environmental Quality
Date: October 11, 2011

General Information:
5 samples were analyzed for SM 2320B. All samples were received in acceptable condition with any exceptions noted below.

Hold Time:
The samples were analyzed within the method required hold times with any exceptions noted below.

Method Blank:
All analytes were below the report limit in the method blank with any exceptions noted below.

Laboratory Control Spike:
All laboratory control spike compounds were within QC limits with any exceptions noted below.

Matrix Spikes:
All percent recoveries and relative percent differences (RPDs) were within acceptance criteria with any exceptions noted below.

QC Batch: WET/22674

A matrix spike and matrix spike duplicate (MS/MSD) were performed on the following sample(s): 10160707001,10160722002

M1: Matrix spike recovery exceeded QC limits. Batch accepted based on laboratory control sample (LCS) recovery.

- MS (Lab ID: 998343)
  - Alkalinity, Total as CaCO3
- MSD (Lab ID: 998344)
  - Alkalinity, Total as CaCO3

Duplicate Sample:
All duplicate sample results were within method acceptance criteria with any exceptions noted below.

Additional Comments:

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PROJECT NARRATIVE

Project: Black Pine Mine REV
Pace Project No.: 10160707

Method: **SM 2540C**
Description: 2540C Total Dissolved Solids
Client: Montana Dept. of Environmental Quality
Date: October 11, 2011

General Information:
5 samples were analyzed for SM 2540C. All samples were received in acceptable condition with any exceptions noted below.

Hold Time:
The samples were analyzed within the method required hold times with any exceptions noted below.

Method Blank:
All analytes were below the report limit in the method blank with any exceptions noted below.

Laboratory Control Spike:
All laboratory control spike compounds were within QC limits with any exceptions noted below.

Matrix Spikes:
All percent recoveries and relative percent differences (RPDs) were within acceptance criteria with any exceptions noted below.

Duplicate Sample:
All duplicate sample results were within method acceptance criteria with any exceptions noted below.

Additional Comments:

This data package has been reviewed for quality and completeness and is approved for release.

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ANALYTICAL RESULTS

Project: Black Pine Mine REV
Pace Project No.: 10160707

Sample: TSP-8 **Lab ID: 10160707001** Collected: 06/13/11 16:45 Received: 06/17/11 08:50 Matrix: Water

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
200.8 MET ICPMS	Analytical Method: EPA 200.8 Preparation Method: EPA 200.8							
Antimony	**1.2**	ug/L	0.50	1	06/28/11 15:18	06/30/11 07:12	7440-36-0	
Arsenic	**1.7**	ug/L	0.50	1	06/28/11 15:18	06/30/11 07:12	7440-38-2	
Barium	**83.5**	ug/L	0.30	1	06/28/11 15:18	06/30/11 07:12	7440-39-3	
Cadmium	**0.28**	ug/L	0.080	1	06/28/11 15:18	06/30/11 07:12	7440-43-9	
Chromium	**2.3**	ug/L	0.50	1	06/28/11 15:18	06/30/11 07:12	7440-47-3	
Copper	**24.2**	ug/L	0.50	1	06/28/11 15:18	06/30/11 07:12	7440-50-8	
Iron	**2130**	ug/L	50.0	1	06/28/11 15:18	06/30/11 07:12	7439-89-6	
Lead	**1.8**	ug/L	0.10	1	06/28/11 15:18	06/30/11 07:12	7439-92-1	
Manganese	**13.6**	ug/L	0.50	1	06/28/11 15:18	06/30/11 07:12	7439-96-5	
Nickel	**3.4**	ug/L	0.50	1	06/28/11 15:18	06/30/11 07:12	7440-02-0	
Silver	**<0.50**	ug/L	0.50	1	06/28/11 15:18	06/30/11 15:05	7440-22-4	
Total Hardness by 2340B	**17800**	ug/L	71.0	1	06/28/11 15:18	06/30/11 07:12		
Zinc	**22.3**	ug/L	5.0	1	06/28/11 15:18	06/30/11 07:12	7440-66-6	
2310 Acidity	Analytical Method: SM 2310							
Acidity	**12.0**	mg/L	5.0	1		06/24/11 16:00		
2540D Total Suspended Solids	Analytical Method: SM 2540D							
Total Suspended Solids	**1.5**	mg/L	1.0	1		06/20/11 10:40		
300.0 IC Anions	Analytical Method: EPA 300.0							
Sulfate	**10.1**	mg/L	2.0	2		06/26/11 22:57	14808-79-8	
2320B Alkalinity	Analytical Method: SM 2320B							
Alkalinity, Total as CaCO3	**13.4**	mg/L	5.0	1		06/20/11 11:18		
2540C Total Dissolved Solids	Analytical Method: SM 2540C							
Total Dissolved Solids	**125**	mg/L	10.0	1		06/20/11 12:03		

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ANALYTICAL RESULTS

Project: Black Pine Mine REV
Pace Project No.: 10160707

Sample: BP-TS-SD-01-00 **Lab ID: 10160707002** Collected: 06/13/11 16:55 Received: 06/17/11 08:50 Matrix: Solid

Results reported on a "dry-weight" basis

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
6020 MET ICPMS	Analytical Method: EPA 6020 Preparation Method: EPA 3050							
Antimony	**37.2**	mg/kg	1.4	20	06/28/11 17:42	06/29/11 20:07	7440-36-0	
Arsenic	**31.1**	mg/kg	1.4	20	06/28/11 17:42	06/29/11 20:07	7440-38-2	
Barium	**266**	mg/kg	4.1	100	06/28/11 17:42	07/01/11 12:54	7440-39-3	
Cadmium	**9.1**	mg/kg	0.22	20	06/28/11 17:42	06/29/11 20:07	7440-43-9	
Chromium	**10.7**	mg/kg	1.4	20	06/28/11 17:42	06/29/11 20:07	7440-47-3	
Cobalt	**6.5**	mg/kg	1.4	20	06/28/11 17:42	06/29/11 20:07	7440-48-4	
Copper	**639**	mg/kg	1.4	20	06/28/11 17:42	06/29/11 20:07	7440-50-8	
Iron	**10100**	mg/kg	137	20	06/28/11 17:42	06/29/11 20:07	7439-89-6	
Lead	**110**	mg/kg	1.4	100	06/28/11 17:42	07/01/11 12:54	7439-92-1	
Manganese	**1140**	mg/kg	1.4	20	06/28/11 17:42	06/29/11 20:07	7439-96-5	
Nickel	**24.5**	mg/kg	1.4	20	06/28/11 17:42	06/29/11 20:07	7440-02-0	
Zinc	**236**	mg/kg	13.7	20	06/28/11 17:42	06/29/11 20:07	7440-66-6	
7471 Mercury	Analytical Method: EPA 7471 Preparation Method: EPA 7471							
Mercury	**0.23**	mg/kg	0.059	1	06/29/11 16:02	06/30/11 10:16	7439-97-6	
Dry Weight	Analytical Method: % Moisture							
Percent Moisture	**65.9**	%	0.10	1		06/27/11 00:00		

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ANALYTICAL RESULTS

Project: Black Pine Mine REV
Pace Project No.: 10160707

Sample: CML-SW-06 **Lab ID: 10160707003** Collected: 06/13/11 16:30 Received: 06/17/11 08:50 Matrix: Water

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
200.8 MET ICPMS	Analytical Method: EPA 200.8 Preparation Method: EPA 200.8							
Antimony	**117**	ug/L	0.50	1	06/28/11 15:18	06/30/11 07:17	7440-36-0	
Arsenic	**36.0**	ug/L	0.50	1	06/28/11 15:18	06/30/11 07:17	7440-38-2	
Barium	**59.2**	ug/L	0.30	1	06/28/11 15:18	06/30/11 07:17	7440-39-3	
Cadmium	**1.1**	ug/L	0.080	1	06/28/11 15:18	06/30/11 07:17	7440-43-9	
Chromium	**1.0**	ug/L	0.50	1	06/28/11 15:18	06/30/11 07:17	7440-47-3	
Copper	**133**	ug/L	0.50	1	06/28/11 15:18	06/30/11 07:17	7440-50-8	
Iron	**117**	ug/L	50.0	1	06/28/11 15:18	06/30/11 07:17	7439-89-6	
Lead	**6.7**	ug/L	0.10	1	06/28/11 15:18	06/30/11 07:17	7439-92-1	
Manganese	**39.1**	ug/L	0.50	1	06/28/11 15:18	06/30/11 07:17	7439-96-5	
Nickel	**3.2**	ug/L	0.50	1	06/28/11 15:18	06/30/11 07:17	7440-02-0	
Silver	**<0.50**	ug/L	0.50	1	06/28/11 15:18	06/30/11 15:22	7440-22-4	
Zinc	**63.1**	ug/L	5.0	1	06/28/11 15:18	06/30/11 07:17	7440-66-6	
2310 Acidity	Analytical Method: SM 2310							
Acidity	**<5.0**	mg/L	5.0	1		06/24/11 16:00		
2540D Total Suspended Solids	Analytical Method: SM 2540D							
Total Suspended Solids	**2.4**	mg/L	1.0	1		06/20/11 10:40		
300.0 IC Anions	Analytical Method: EPA 300.0							
Sulfate	**60.0**	mg/L	2.0	2		06/26/11 23:26	14808-79-8	
2320B Alkalinity	Analytical Method: SM 2320B							
Alkalinity, Total as CaCO3	**52.5**	mg/L	5.0	1		06/20/11 11:31		
2540C Total Dissolved Solids	Analytical Method: SM 2540C							
Total Dissolved Solids	**148**	mg/L	10.0	1		06/20/11 12:04		

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ANALYTICAL RESULTS

Project: Black Pine Mine REV
Pace Project No.: 10160707

Sample: CML-SD-06-00 **Lab ID: 10160707004** Collected: 06/13/11 16:35 Received: 06/17/11 08:50 Matrix: Solid

Results reported on a "dry-weight" basis

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
6020 MET ICPMS	Analytical Method: EPA 6020 Preparation Method: EPA 3050							
Antimony	**891**	mg/kg	1.1	20	06/28/11 17:42	06/29/11 20:11	7440-36-0	
Arsenic	**642**	mg/kg	1.1	20	06/28/11 17:42	06/29/11 20:11	7440-38-2	
Barium	**353**	mg/kg	31.7	1000	06/28/11 17:42	07/01/11 12:58	7440-39-3	
Cadmium	**28.6**	mg/kg	0.17	20	06/28/11 17:42	06/29/11 20:11	7440-43-9	
Chromium	**8.2**	mg/kg	1.1	20	06/28/11 17:42	06/29/11 20:11	7440-47-3	
Cobalt	**7.6**	mg/kg	1.1	20	06/28/11 17:42	06/29/11 20:11	7440-48-4	
Copper	**3620**	mg/kg	52.9	1000	06/28/11 17:42	07/01/11 12:58	7440-50-8	
Iron	**21200**	mg/kg	106	20	06/28/11 17:42	06/29/11 20:11	7439-89-6	
Lead	**3760**	mg/kg	10.6	1000	06/28/11 17:42	07/01/11 12:58	7439-92-1	
Manganese	**602**	mg/kg	1.1	20	06/28/11 17:42	06/29/11 20:11	7439-96-5	
Nickel	**14.6**	mg/kg	1.1	20	06/28/11 17:42	06/29/11 20:11	7440-02-0	
Zinc	**768**	mg/kg	10.6	20	06/28/11 17:42	06/29/11 20:11	7440-66-6	
7471 Mercury	Analytical Method: EPA 7471 Preparation Method: EPA 7471							
Mercury	**32.8**	mg/kg	0.91	20	06/29/11 16:02	06/30/11 10:45	7439-97-6	
Dry Weight	Analytical Method: % Moisture							
Percent Moisture	**55.8**	%	0.10	1		06/27/11 00:00		

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ANALYTICAL RESULTS

Project: Black Pine Mine REV
Pace Project No.: 10160707

Sample: TSP-3 **Lab ID: 10160707005** Collected: 06/13/11 15:30 Received: 06/17/11 08:50 Matrix: Water

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
200.8 MET ICPMS	Analytical Method: EPA 200.8 Preparation Method: EPA 200.8							
Antimony	**0.53**	ug/L	0.50	1	06/28/11 15:18	06/30/11 07:21	7440-36-0	
Arsenic	**1.2**	ug/L	0.50	1	06/28/11 15:18	06/30/11 07:21	7440-38-2	
Barium	**85.1**	ug/L	0.30	1	06/28/11 15:18	06/30/11 07:21	7440-39-3	
Cadmium	**0.14**	ug/L	0.080	1	06/28/11 15:18	06/30/11 07:21	7440-43-9	
Chromium	**1.7**	ug/L	0.50	1	06/28/11 15:18	06/30/11 07:21	7440-47-3	
Copper	**30.5**	ug/L	0.50	1	06/28/11 15:18	06/30/11 07:21	7440-50-8	
Iron	**1180**	ug/L	50.0	1	06/28/11 15:18	06/30/11 07:21	7439-89-6	
Lead	**0.86**	ug/L	0.10	1	06/28/11 15:18	06/30/11 07:21	7439-92-1	
Manganese	**11.5**	ug/L	0.50	1	06/28/11 15:18	06/30/11 07:21	7439-96-5	
Nickel	**2.1**	ug/L	0.50	1	06/28/11 15:18	06/30/11 07:21	7440-02-0	
Silver	**<0.50**	ug/L	0.50	1	06/28/11 15:18	06/30/11 15:25	7440-22-4	
Zinc	**10.4**	ug/L	5.0	1	06/28/11 15:18	06/30/11 07:21	7440-66-6	
2310 Acidity	Analytical Method: SM 2310							
Acidity	**8.2**	mg/L	5.0	1		06/24/11 16:00		
2540D Total Suspended Solids	Analytical Method: SM 2540D							
Total Suspended Solids	**3.1**	mg/L	1.0	1		06/20/11 10:40		
300.0 IC Anions	Analytical Method: EPA 300.0							
Sulfate	**4.9**	mg/L	2.0	2		06/26/11 23:54	14808-79-8	
2320B Alkalinity	Analytical Method: SM 2320B							
Alkalinity, Total as CaCO3	**11.9**	mg/L	5.0	1		06/20/11 11:35		
2540C Total Dissolved Solids	Analytical Method: SM 2540C							
Total Dissolved Solids	**80.0**	mg/L	10.0	1		06/20/11 11:19		

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ANALYTICAL RESULTS

Project: Black Pine Mine REV
Pace Project No.: 10160707

Sample: BP-TS-SD-02-00 **Lab ID: 10160707006** Collected: 06/13/11 15:40 Received: 06/17/11 08:50 Matrix: Solid

Results reported on a "dry-weight" basis

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
6020 MET ICPMS	Analytical Method: EPA 6020 Preparation Method: EPA 3050							
Antimony	**3.2**	mg/kg	1.5	20	06/28/11 17:42	06/29/11 20:16	7440-36-0	
Arsenic	**22.4**	mg/kg	1.5	20	06/28/11 17:42	06/29/11 20:16	7440-38-2	
Barium	**635**	mg/kg	4.6	100	06/28/11 17:42	07/01/11 13:03	7440-39-3	
Cadmium	**1.1**	mg/kg	0.24	20	06/28/11 17:42	06/29/11 20:16	7440-43-9	
Chromium	**16.0**	mg/kg	1.5	20	06/28/11 17:42	06/29/11 20:16	7440-47-3	
Cobalt	**11.6**	mg/kg	1.5	20	06/28/11 17:42	06/29/11 20:16	7440-48-4	
Copper	**50.9**	mg/kg	1.5	20	06/28/11 17:42	06/29/11 20:16	7440-50-8	
Iron	**24700**	mg/kg	153	20	06/28/11 17:42	06/29/11 20:16	7439-89-6	
Lead	**65.2**	mg/kg	1.5	100	06/28/11 17:42	07/01/11 13:03	7439-92-1	
Manganese	**947**	mg/kg	1.5	20	06/28/11 17:42	06/29/11 20:16	7439-96-5	
Nickel	**20.0**	mg/kg	1.5	20	06/28/11 17:42	06/29/11 20:16	7440-02-0	
Zinc	**117**	mg/kg	15.3	20	06/28/11 17:42	06/29/11 20:16	7440-66-6	
7471 Mercury	Analytical Method: EPA 7471 Preparation Method: EPA 7471							
Mercury	**24.4**	mg/kg	1.1	20	06/29/11 16:02	06/30/11 10:47	7439-97-6	
Dry Weight	Analytical Method: % Moisture							
Percent Moisture	**68.9**	%	0.10	1		06/27/11 00:00		

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ANALYTICAL RESULTS

Project: Black Pine Mine REV
Pace Project No.: 10160707

Sample: TSP-9 **Lab ID: 10160707007** Collected: 06/13/11 17:30 Received: 06/17/11 08:50 Matrix: Water

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
200.8 MET ICPMS	Analytical Method: EPA 200.8 Preparation Method: EPA 200.8							
Antimony	**0.57**	ug/L	0.50	1	06/28/11 15:18	06/30/11 07:26	7440-36-0	
Arsenic	**1.7**	ug/L	0.50	1	06/28/11 15:18	06/30/11 07:26	7440-38-2	
Barium	**86.7**	ug/L	0.30	1	06/28/11 15:18	06/30/11 07:26	7440-39-3	
Cadmium	**0.25**	ug/L	0.080	1	06/28/11 15:18	06/30/11 07:26	7440-43-9	
Chromium	**2.9**	ug/L	0.50	1	06/28/11 15:18	06/30/11 07:26	7440-47-3	
Copper	**8.9**	ug/L	0.50	1	06/28/11 15:18	06/30/11 07:26	7440-50-8	
Iron	**2780**	ug/L	50.0	1	06/28/11 15:18	06/30/11 07:26	7439-89-6	
Lead	**1.5**	ug/L	0.10	1	06/28/11 15:18	06/30/11 07:26	7439-92-1	
Manganese	**18.8**	ug/L	0.50	1	06/28/11 15:18	06/30/11 07:26	7439-96-5	
Nickel	**4.2**	ug/L	0.50	1	06/28/11 15:18	06/30/11 07:26	7440-02-0	
Silver	**<0.50**	ug/L	0.50	1	06/28/11 15:18	06/30/11 15:29	7440-22-4	
Zinc	**19.0**	ug/L	5.0	1	06/28/11 15:18	06/30/11 07:26	7440-66-6	
2310 Acidity	Analytical Method: SM 2310							
Acidity	**13.9**	mg/L	5.0	1		06/24/11 16:00		
2540D Total Suspended Solids	Analytical Method: SM 2540D							
Total Suspended Solids	**4.1**	mg/L	1.0	1		06/20/11 10:40		
300.0 IC Anions	Analytical Method: EPA 300.0							
Sulfate	**4.1**	mg/L	2.0	2		06/27/11 00:23	14808-79-8	
2320B Alkalinity	Analytical Method: SM 2320B							
Alkalinity, Total as CaCO3	**15.2**	mg/L	5.0	1		06/20/11 11:38		
2540C Total Dissolved Solids	Analytical Method: SM 2540C							
Total Dissolved Solids	**122**	mg/L	10.0	1		06/20/11 11:20		

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ANALYTICAL RESULTS

Project: Black Pine Mine REV
Pace Project No.: 10160707

Sample: MCSP-1 **Lab ID: 10160707008** Collected: 06/13/11 14:40 Received: 06/17/11 08:50 Matrix: Water

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
200.8 MET ICPMS	Analytical Method: EPA 200.8 Preparation Method: EPA 200.8							
Antimony	**1.4**	ug/L	0.50	1	06/28/11 15:18	06/30/11 07:30	7440-36-0	
Arsenic	**1.6**	ug/L	0.50	1	06/28/11 15:18	06/30/11 07:30	7440-38-2	
Barium	**65.7**	ug/L	0.30	1	06/28/11 15:18	06/30/11 07:30	7440-39-3	
Cadmium	**0.26**	ug/L	0.080	1	06/28/11 15:18	06/30/11 07:30	7440-43-9	
Chromium	**1.5**	ug/L	0.50	1	06/28/11 15:18	06/30/11 07:30	7440-47-3	
Copper	**107**	ug/L	0.50	1	06/28/11 15:18	06/30/11 07:30	7440-50-8	
Iron	**1080**	ug/L	50.0	1	06/28/11 15:18	06/30/11 07:30	7439-89-6	
Lead	**2.9**	ug/L	0.10	1	06/28/11 15:18	06/30/11 07:30	7439-92-1	
Manganese	**15.4**	ug/L	0.50	1	06/28/11 15:18	06/30/11 07:30	7439-96-5	
Nickel	**2.3**	ug/L	0.50	1	06/28/11 15:18	06/30/11 07:30	7440-02-0	
Silver	**<0.50**	ug/L	0.50	1	06/28/11 15:18	06/30/11 15:32	7440-22-4	
Total Hardness by 2340B	**17800**	ug/L	71.0	1	06/28/11 15:18	06/30/11 07:30		
Zinc	**31.4**	ug/L	5.0	1	06/28/11 15:18	06/30/11 07:30	7440-66-6	
2310 Acidity	Analytical Method: SM 2310							
Acidity	**25.2**	mg/L	5.0	1		06/24/11 16:00		
2540D Total Suspended Solids	Analytical Method: SM 2540D							
Total Suspended Solids	**5.3**	mg/L	1.0	1		06/20/11 10:40		
300.0 IC Anions	Analytical Method: EPA 300.0							
Sulfate	**11.4**	mg/L	2.0	2		06/27/11 00:51	14808-79-8	
2320B Alkalinity	Analytical Method: SM 2320B							
Alkalinity, Total as CaCO3	**8.9**	mg/L	5.0	1		06/20/11 11:42		
2540C Total Dissolved Solids	Analytical Method: SM 2540C							
Total Dissolved Solids	**105**	mg/L	10.0	1		06/20/11 11:20		

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ANALYTICAL RESULTS

Project: Black Pine Mine REV
Pace Project No.: 10160707

Sample: HM-SD-01 **Lab ID: 10160707009** Collected: 06/13/11 14:45 Received: 06/17/11 08:50 Matrix: Solid

Results reported on a "dry-weight" basis

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
6020 MET ICPMS	Analytical Method: EPA 6020 Preparation Method: EPA 3050							
Antimony	**20.0**	mg/kg	1.4	20	06/28/11 17:42	06/29/11 20:25	7440-36-0	
Arsenic	**24.8**	mg/kg	1.4	20	06/28/11 17:42	06/29/11 20:25	7440-38-2	
Barium	**752**	mg/kg	4.1	100	06/28/11 17:42	07/01/11 13:07	7440-39-3	
Cadmium	**4.9**	mg/kg	0.22	20	06/28/11 17:42	06/29/11 20:25	7440-43-9	
Chromium	**20.7**	mg/kg	1.4	20	06/28/11 17:42	06/29/11 20:25	7440-47-3	
Cobalt	**9.8**	mg/kg	1.4	20	06/28/11 17:42	06/29/11 20:25	7440-48-4	
Copper	**2780**	mg/kg	6.8	100	06/28/11 17:42	07/01/11 13:07	7440-50-8	
Iron	**21400**	mg/kg	135	20	06/28/11 17:42	06/29/11 20:25	7439-89-6	
Lead	**305**	mg/kg	1.4	100	06/28/11 17:42	07/01/11 13:07	7439-92-1	
Manganese	**2780**	mg/kg	6.8	100	06/28/11 17:42	07/01/11 13:07	7439-96-5	
Nickel	**26.8**	mg/kg	1.4	20	06/28/11 17:42	06/29/11 20:25	7440-02-0	
Zinc	**272**	mg/kg	13.5	20	06/28/11 17:42	06/29/11 20:25	7440-66-6	
7471 Mercury	Analytical Method: EPA 7471 Preparation Method: EPA 7471							
Mercury	**27.4**	mg/kg	1.0	20	06/29/11 16:02	06/30/11 10:49	7439-97-6	M6
Dry Weight	Analytical Method: % Moisture							
Percent Moisture	**65.2**	%	0.10	1		06/27/11 00:00		

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QUALITY CONTROL DATA

Project: Black Pine Mine REV
Pace Project No.: 10160707

QC Batch: MPRP/26726 Analysis Method: EPA 200.8
QC Batch Method: EPA 200.8 Analysis Description: 200.8 MET
Associated Lab Samples: 10160707001, 10160707003, 10160707005, 10160707007, 10160707008

METHOD BLANK: 998290 Matrix: Water
Associated Lab Samples: 10160707001, 10160707003, 10160707005, 10160707007, 10160707008

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Antimony	ug/L	<0.50	0.50	06/30/11 06:01	
Arsenic	ug/L	<0.50	0.50	06/30/11 06:01	
Barium	ug/L	<0.30	0.30	06/30/11 06:01	
Cadmium	ug/L	<0.080	0.080	06/30/11 06:01	
Chromium	ug/L	<0.50	0.50	06/30/11 06:01	
Copper	ug/L	<0.50	0.50	06/30/11 06:01	
Iron	ug/L	<50.0	50.0	06/30/11 06:01	
Lead	ug/L	<0.10	0.10	06/30/11 06:01	
Manganese	ug/L	<0.50	0.50	06/30/11 06:01	
Nickel	ug/L	<0.50	0.50	06/30/11 06:01	
Silver	ug/L	<0.50	0.50	06/30/11 06:01	
Zinc	ug/L	<5.0	5.0	06/30/11 06:01	

LABORATORY CONTROL SAMPLE: 998291

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Antimony	ug/L	80	79.8	100	85-115	
Arsenic	ug/L	80	82.4	103	85-115	
Barium	ug/L	80	81.9	102	85-115	
Cadmium	ug/L	80	81.5	102	85-115	
Chromium	ug/L	80	81.8	102	85-115	
Copper	ug/L	80	85.5	107	85-115	
Iron	ug/L	1000	1020	102	85-115	
Lead	ug/L	80	81.7	102	85-115	
Manganese	ug/L	80	82.0	102	85-115	
Nickel	ug/L	80	79.6	99	85-115	
Silver	ug/L	80	86.3	108	85-115	
Zinc	ug/L	80	77.7	97	85-115	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 998292 998293

Parameter	Units	10160655001 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Antimony	ug/L	42.9	80	80	125	128	103	106	70-130	2	20	
Arsenic	ug/L	12.8	80	80	95.3	95.4	103	103	70-130	.1	20	
Barium	ug/L	81.7	80	80	170	170	111	110	70-130	.5	20	
Cadmium	ug/L	1.2	80	80	84.3	82.5	104	102	70-130	2	20	
Chromium	ug/L	1.3	80	80	85.1	84.1	105	104	70-130	1	20	
Copper	ug/L	221	80	80	314	311	116	114	70-130	.7	20	
Iron	ug/L	1430	1000	1000	2810	2900	138	147	70-130	3	20	M1

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QUALITY CONTROL DATA

Project: Black Pine Mine REV
Pace Project No.: 10160707

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 998292 998293

Parameter	Units	10160655001 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Lead	ug/L	49.0	80	80	133	134	104	106	70-130	.8	20	
Manganese	ug/L	12.9	80	80	96.2	96.9	104	105	70-130	.7	20	
Nickel	ug/L	2.1	80	80	81.6	81.0	99	99	70-130	.8	20	
Silver	ug/L	0.64	80	80	80.9	84.1	100	104	70-130	4	20	
Zinc	ug/L	40.5	80	80	122	120	101	99	70-130	2	20	

MATRIX SPIKE SAMPLE: 998294

Parameter	Units	10160673004 Result	Spike Conc.	MS Result	MS % Rec	% Rec Limits	Qualifiers
Antimony	ug/L	0.53	80	78.9	98	70-130	
Arsenic	ug/L	1.1	80	82.3	101	70-130	
Barium	ug/L	85.4	80	169	104	70-130	
Cadmium	ug/L	<0.080	80	80.3	100	70-130	
Chromium	ug/L	1.3	80	83.0	102	70-130	
Copper	ug/L	22.5	80	106	104	70-130	
Iron	ug/L	1000	1000	2310	131	70-130	M1
Lead	ug/L	0.97	80	81.2	100	70-130	
Manganese	ug/L	8.9	80	89.0	100	70-130	
Nickel	ug/L	2.2	80	79.7	97	70-130	
Silver	ug/L	<0.50	80	78.7	98	70-130	
Zinc	ug/L	8.2	80	85.9	97	70-130	

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QUALITY CONTROL DATA

Project: Black Pine Mine REV
Pace Project No.: 10160707

QC Batch: MPRP/26729 Analysis Method: EPA 6020
QC Batch Method: EPA 3050 Analysis Description: 6020 MET
Associated Lab Samples: 10160707002, 10160707004, 10160707006, 10160707009

METHOD BLANK: 998304 Matrix: Solid
Associated Lab Samples: 10160707002, 10160707004, 10160707006, 10160707009

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Antimony	mg/kg	<0.41	0.41	06/29/11 18:04	
Arsenic	mg/kg	<0.41	0.41	06/29/11 18:04	
Barium	mg/kg	<0.25	0.25	06/29/11 18:04	
Cadmium	mg/kg	<0.066	0.066	06/29/11 18:04	
Chromium	mg/kg	<0.41	0.41	06/29/11 18:04	
Cobalt	mg/kg	<0.41	0.41	06/29/11 18:04	
Copper	mg/kg	<0.41	0.41	06/29/11 18:04	
Iron	mg/kg	<41.3	41.3	06/29/11 18:04	
Lead	mg/kg	<0.083	0.083	07/01/11 11:24	
Manganese	mg/kg	<0.41	0.41	06/29/11 18:04	
Nickel	mg/kg	<0.41	0.41	06/29/11 18:04	
Zinc	mg/kg	<4.1	4.1	06/29/11 18:04	

LABORATORY CONTROL SAMPLE: 998305

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Antimony	mg/kg	17.9	18.5	103	75-125	
Arsenic	mg/kg	17.9	19.0	106	75-125	
Barium	mg/kg	17.9	19.5	109	75-125	
Cadmium	mg/kg	17.9	19.1	107	75-125	
Chromium	mg/kg	17.9	19.5	109	75-125	
Cobalt	mg/kg	17.9	19.6	110	75-125	
Copper	mg/kg	17.9	20.1	113	75-125	
Iron	mg/kg	223	248	111	75-125	
Lead	mg/kg	17.9	19.5	109	75-125	
Manganese	mg/kg	17.9	19.8	111	75-125	
Nickel	mg/kg	17.9	20.1	113	75-125	
Zinc	mg/kg	17.9	19.7	110	75-125	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 998306 998307

Parameter	Units	10160673001 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Antimony	mg/kg	16.7	43.1	54.2	51.5	63.1	81	85	75-125	20	20	
Arsenic	mg/kg	27.9	43.1	54.2	72.3	84.9	103	105	75-125	16	20	
Barium	mg/kg	335	43.1	54.2	400	425	151	166	75-125	6	20	M6
Cadmium	mg/kg	1.4	43.1	54.2	43.5	55.7	98	100	75-125	25	20	D6
Chromium	mg/kg	8.3	43.1	54.2	60.7	70.9	122	115	75-125	15	20	
Cobalt	mg/kg	19.3	43.1	54.2	64.4	75.4	105	103	75-125	16	20	
Copper	mg/kg	109	43.1	54.2	173	172	149	115	75-125	.7	20	M6

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QUALITY CONTROL DATA

Project: Black Pine Mine REV
Pace Project No.: 10160707

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 998306 998307

Parameter	Units	10160673001 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Iron	mg/kg	12400	539	678	15600	15500	596	454	75-125	.8	20	M6
Lead	mg/kg	74.2	43.1	54.2	140	150	154	139	75-125	6	20	M6
Manganese	mg/kg	1980	43.1	54.2	1850	1860	-295	-213	75-125	.6	20	M6
Nickel	mg/kg	11.4	43.1	54.2	60.1	71.7	113	111	75-125	18	20	
Zinc	mg/kg	144	43.1	54.2	210	219	154	138	75-125	4	20	M6

MATRIX SPIKE SAMPLE: 998308

Parameter	Units	10160673014 Result	Spike Conc.	MS Result	MS % Rec	% Rec Limits	Qualifiers
Antimony	mg/kg	16.8	32.4	32.0	47	75-125	M6
Arsenic	mg/kg	19.4	32.4	51.9	100	75-125	
Barium	mg/kg	143	32.4	248	324	75-125	M6
Cadmium	mg/kg	0.43	32.4	32.0	98	75-125	
Chromium	mg/kg	20.7	32.4	66.1	140	75-125	M6
Cobalt	mg/kg	7.6	32.4	49.0	128	75-125	
Copper	mg/kg	57.9	32.4	85.9	86	75-125	
Iron	mg/kg	22300	404	36400	3500	75-125	M6
Lead	mg/kg	207	32.4	131	-236	75-125	M6
Manganese	mg/kg	404	32.4	1300	2780	75-125	M6
Nickel	mg/kg	9.1	32.4	46.0	114	75-125	
Zinc	mg/kg	40.5	32.4	109	213	75-125	M6

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QUALITY CONTROL DATA

Project: Black Pine Mine REV
Pace Project No.: 10160707

QC Batch: MERP/5542 Analysis Method: EPA 7471
QC Batch Method: EPA 7471 Analysis Description: 7471 Mercury
Associated Lab Samples: 10160707002, 10160707004, 10160707006, 10160707009

METHOD BLANK: 999060 Matrix: Solid
Associated Lab Samples: 10160707002, 10160707004, 10160707006, 10160707009

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Mercury	mg/kg	<0.019	0.019	06/30/11 08:35	

LABORATORY CONTROL SAMPLE: 999061

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Mercury	mg/kg	.48	0.50	104	80-120	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 999062 999063

Parameter	Units	10160673001 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Mercury	mg/kg	14.4	1.4	1.5	14.3	20.1	-9	368	80-120	34	20	D6,M6

MATRIX SPIKE SAMPLE: 999064

Parameter	Units	10160707009 Result	Spike Conc.	MS Result	MS % Rec	% Rec Limits	Qualifiers
Mercury	mg/kg	27.4	1.3	27.7	16	80-120	M6

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QUALITY CONTROL DATA

Project: Black Pine Mine REV
Pace Project No.: 10160707

QC Batch: MPRP/26864 Analysis Method: % Moisture
QC Batch Method: % Moisture Analysis Description: Dry Weight/Percent Moisture
Associated Lab Samples: 10160707002, 10160707004, 10160707006, 10160707009

SAMPLE DUPLICATE: 1003029

Parameter	Units	10160673011 Result	Dup Result	RPD	Max RPD	Qualifiers
Percent Moisture	%	21.0	21.1	.5	30	

SAMPLE DUPLICATE: 1003030

Parameter	Units	10160756011 Result	Dup Result	RPD	Max RPD	Qualifiers
Percent Moisture	%	31.0	34.4	10	30	

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QUALITY CONTROL DATA

Project: Black Pine Mine REV
Pace Project No.: 10160707

QC Batch: MT/6228 Analysis Method: SM 2310
QC Batch Method: SM 2310 Analysis Description: 2310 Acidity
Associated Lab Samples: 10160707001, 10160707003, 10160707005, 10160707007, 10160707008

METHOD BLANK: 1000993 Matrix: Water
Associated Lab Samples: 10160707001, 10160707003, 10160707005, 10160707007, 10160707008

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Acidity	mg/L	<5.0	5.0	06/24/11 16:00	

SAMPLE DUPLICATE: 1000995

Parameter	Units	10160655003 Result	Dup Result	RPD	Max RPD	Qualifiers
Acidity	mg/L	16.7	16.7	0	20	

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QUALITY CONTROL DATA

Project: Black Pine Mine REV
Pace Project No.: 10160707

QC Batch: MT/6192 Analysis Method: SM 2540D
QC Batch Method: SM 2540D Analysis Description: 2540D Total Suspended Solids
Associated Lab Samples: 10160707001, 10160707003, 10160707005, 10160707007, 10160707008

METHOD BLANK: 998564 Matrix: Water
Associated Lab Samples: 10160707001, 10160707003, 10160707005, 10160707007, 10160707008

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Total Suspended Solids	mg/L	<1.0	1.0	06/20/11 10:40	

LABORATORY CONTROL SAMPLE: 998563

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Total Suspended Solids	mg/L	25	25.0	100	71-129	

SAMPLE DUPLICATE: 998919

Parameter	Units	10160673006 Result	Dup Result	RPD	Max RPD	Qualifiers
Total Suspended Solids	mg/L	<2.0	<2.0		20	

SAMPLE DUPLICATE: 998920

Parameter	Units	10160655005 Result	Dup Result	RPD	Max RPD	Qualifiers
Total Suspended Solids	mg/L	<2.0	2.2		20	

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QUALITY CONTROL DATA

Project: Black Pine Mine REV
Pace Project No.: 10160707

QC Batch: MT/6253 Analysis Method: EPA 300.0
QC Batch Method: EPA 300.0 Analysis Description: 300.0 IC Anions
Associated Lab Samples: 10160707001, 10160707003, 10160707005, 10160707007, 10160707008

METHOD BLANK: 1002777 Matrix: Water
Associated Lab Samples: 10160707001, 10160707003, 10160707005, 10160707007, 10160707008

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Sulfate	mg/L	<1.0	1.0	06/26/11 16:47	

LABORATORY CONTROL SAMPLE: 1002778

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Sulfate	mg/L	20	19.7	99	90-110	

MATRIX SPIKE SAMPLE: 1002779

Parameter	Units	10160722001 Result	Spike Conc.	MS Result	MS % Rec	% Rec Limits	Qualifiers
Sulfate	mg/L	17.3	40	60.6	108	80-120	

MATRIX SPIKE SAMPLE: 1002781

Parameter	Units	10161012001 Result	Spike Conc.	MS Result	MS % Rec	% Rec Limits	Qualifiers
Sulfate	mg/L	26.4	40	70.7	111	80-120	

SAMPLE DUPLICATE: 1002780

Parameter	Units	10160722002 Result	Dup Result	RPD	Max RPD	Qualifiers
Sulfate	mg/L	755	755	.1	20	

SAMPLE DUPLICATE: 1002782

Parameter	Units	10161012002 Result	Dup Result	RPD	Max RPD	Qualifiers
Sulfate	mg/L	1220	1220	.1	20	

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QUALITY CONTROL DATA

Project: Black Pine Mine REV
Pace Project No.: 10160707

QC Batch: WET/22674 Analysis Method: SM 2320B
QC Batch Method: SM 2320B Analysis Description: 2320B Alkalinity
Associated Lab Samples: 10160707001, 10160707003, 10160707005, 10160707007, 10160707008

METHOD BLANK: 998338 Matrix: Water
Associated Lab Samples: 10160707001, 10160707003, 10160707005, 10160707007, 10160707008

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Alkalinity, Total as CaCO3	mg/L	<5.0	5.0	06/20/11 11:16	

LABORATORY CONTROL SAMPLE & LCSD: 998339 998340

Parameter	Units	Spike Conc.	LCS Result	LCSD Result	LCS % Rec	LCSD % Rec	% Rec Limits	RPD	Max RPD	Qualifiers
Alkalinity, Total as CaCO3	mg/L	40	39.0	39.7	98	99	90-110	2	30	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 998341 998342

Parameter	Units	10160707001 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Alkalinity, Total as CaCO3	mg/L	13.4	40	40	53.2	53.8	99	101	80-120	1	30	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 998343 998344

Parameter	Units	10160722002 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Alkalinity, Total as CaCO3	mg/L	232	40	40	281	283	124	127	80-120	.4	30	M1

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QUALITY CONTROL DATA

Project: Black Pine Mine REV
Pace Project No.: 10160707

QC Batch: WET/22678 Analysis Method: SM 2540C
QC Batch Method: SM 2540C Analysis Description: 2540C Total Dissolved Solids
Associated Lab Samples: 10160707001, 10160707003, 10160707005, 10160707007, 10160707008

METHOD BLANK: 998440 Matrix: Water
Associated Lab Samples: 10160707001, 10160707003, 10160707005, 10160707007, 10160707008

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Total Dissolved Solids	mg/L	<10.0	10.0	06/20/11 12:01	

LABORATORY CONTROL SAMPLE: 998441

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Total Dissolved Solids	mg/L	1000	982	98	80-120	

SAMPLE DUPLICATE: 998442

Parameter	Units	10160707001 Result	Dup Result	RPD	Max RPD	Qualifiers
Total Dissolved Solids	mg/L	125	115	8	20	

SAMPLE DUPLICATE: 998443

Parameter	Units	10160655002 Result	Dup Result	RPD	Max RPD	Qualifiers
Total Dissolved Solids	mg/L	103	94.0	9	20	

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QUALIFIERS

Project: Black Pine Mine REV
Pace Project No.: 10160707

DEFINITIONS

DF - Dilution Factor, if reported, represents the factor applied to the reported data due to changes in sample preparation, dilution of the sample aliquot, or moisture content.

ND - Not Detected at or above adjusted reporting limit.

J - Estimated concentration above the adjusted method detection limit and below the adjusted reporting limit.

MDL - Adjusted Method Detection Limit.

S - Surrogate

1,2-Diphenylhydrazine (8270 listed analyte) decomposes to Azobenzene.

Consistent with EPA guidelines, unrounded data are displayed and have been used to calculate % recovery and RPD values.

LCS(D) - Laboratory Control Sample (Duplicate)

MS(D) - Matrix Spike (Duplicate)

DUP - Sample Duplicate

RPD - Relative Percent Difference

NC - Not Calculable.

SG - Silica Gel - Clean-Up

U - Indicates the compound was analyzed for, but not detected.

N-Nitrosodiphenylamine decomposes and cannot be separated from Diphenylamine using Method 8270. The result reported for each analyte is a combined concentration.

LABORATORIES

PASI-M	Pace Analytical Services - Minneapolis
PASI-MT	Pace Analytical Services - Montana

ANALYTE QUALIFIERS

D6	The relative percent difference (RPD) between the sample and sample duplicate exceeded laboratory control limits.
M1	Matrix spike recovery exceeded QC limits. Batch accepted based on laboratory control sample (LCS) recovery.
M6	Matrix spike and Matrix spike duplicate recovery not evaluated against control limits due to sample dilution.

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QUALITY CONTROL DATA CROSS REFERENCE TABLE

Project: Black Pine Mine REV
Pace Project No.: 10160707

Lab ID	Sample ID	QC Batch Method	QC Batch	Analytical Method	Analytical Batch
10160707001	**TSP-8**	EPA 200.8	MPRP/26726	EPA 200.8	ICPM/10928
10160707003	**CML-SW-06**	EPA 200.8	MPRP/26726	EPA 200.8	ICPM/10928
10160707005	**TSP-3**	EPA 200.8	MPRP/26726	EPA 200.8	ICPM/10928
10160707007	**TSP-9**	EPA 200.8	MPRP/26726	EPA 200.8	ICPM/10928
10160707008	**MCSP-1**	EPA 200.8	MPRP/26726	EPA 200.8	ICPM/10928
10160707002	**BP-TS-SD-01-00**	EPA 3050	MPRP/26729	EPA 6020	ICPM/10930
10160707004	**CML-SD-06-00**	EPA 3050	MPRP/26729	EPA 6020	ICPM/10930
10160707006	**BP-TS-SD-02-00**	EPA 3050	MPRP/26729	EPA 6020	ICPM/10930
10160707009	**HM-SD-01**	EPA 3050	MPRP/26729	EPA 6020	ICPM/10930
10160707002	**BP-TS-SD-01-00**	EPA 7471	MERP/5542	EPA 7471	MERC/6387
10160707004	**CML-SD-06-00**	EPA 7471	MERP/5542	EPA 7471	MERC/6387
10160707006	**BP-TS-SD-02-00**	EPA 7471	MERP/5542	EPA 7471	MERC/6387
10160707009	**HM-SD-01**	EPA 7471	MERP/5542	EPA 7471	MERC/6387
10160707002	**BP-TS-SD-01-00**	% Moisture	MPRP/26864		
10160707004	**CML-SD-06-00**	% Moisture	MPRP/26864		
10160707006	**BP-TS-SD-02-00**	% Moisture	MPRP/26864		
10160707009	**HM-SD-01**	% Moisture	MPRP/26864		
10160707001	**TSP-8**	SM 2310	MT/6228		
10160707003	**CML-SW-06**	SM 2310	MT/6228		
10160707005	**TSP-3**	SM 2310	MT/6228		
10160707007	**TSP-9**	SM 2310	MT/6228		
10160707008	**MCSP-1**	SM 2310	MT/6228		
10160707001	**TSP-8**	SM 2540D	MT/6192		
10160707003	**CML-SW-06**	SM 2540D	MT/6192		
10160707005	**TSP-3**	SM 2540D	MT/6192		
10160707007	**TSP-9**	SM 2540D	MT/6192		
10160707008	**MCSP-1**	SM 2540D	MT/6192		
10160707001	**TSP-8**	EPA 300.0	MT/6253		
10160707003	**CML-SW-06**	EPA 300.0	MT/6253		
10160707005	**TSP-3**	EPA 300.0	MT/6253		
10160707007	**TSP-9**	EPA 300.0	MT/6253		
10160707008	**MCSP-1**	EPA 300.0	MT/6253		
10160707001	**TSP-8**	SM 2320B	WET/22674		
10160707003	**CML-SW-06**	SM 2320B	WET/22674		
10160707005	**TSP-3**	SM 2320B	WET/22674		
10160707007	**TSP-9**	SM 2320B	WET/22674		
10160707008	**MCSP-1**	SM 2320B	WET/22674		
10160707001	**TSP-8**	SM 2540C	WET/22678		
10160707003	**CML-SW-06**	SM 2540C	WET/22678		
10160707005	**TSP-3**	SM 2540C	WET/22678		
10160707007	**TSP-9**	SM 2540C	WET/22678		
10160707008	**MCSP-1**	SM 2540C	WET/22678		

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October 13, 2011

Kevin Houck
Herrera Environmental Consultants
101 East Broadway, Suite 610
Missoula, MT 59802

RE: Project: REVISED - Black Pine Mine REV
Pace Project No.: 10160756

Dear Kevin Houck:
Enclosed are the analytical results for sample(s) received by the laboratory on June 17, 2011. The results relate only to the samples included in this report.

REVISION - Nickel is reported on sample CML-QT-T2. The results was missing in the original report.

This report has been revised to add Cobalt and delete Silver.

If you have any questions concerning this report, please feel free to contact me.

Sincerely,

Carol Davy for
Denise Jensen
denise.jensen@pacelabs.com
Project Manager

Enclosures

cc: Devin Clary, Montana Dept. of Environmental Quality
Mark Donner, Trihydro
Jamie Mongoven, Montana Dept. of Environmental

REPORT OF LABORATORY ANALYSIS

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CERTIFICATIONS

Project: REVISED - Black Pine Mine REV
Pace Project No.: 10160756

Minnesota Certification IDs

1700 Elm Street SE Suite 200, Minneapolis, MN 55414
A2LA Certification #: 2926.01
Alaska Certification #: UST-078
Alaska Certification #MN00064
Arizona Certification #: AZ-0014
Arkansas Certification #: 88-0680
California Certification #: 01155CA
EPA Region 8 Certification #: Pace
Florida/NELAP Certification #: E87605
Georgia Certification #: 959
Idaho Certification #: MN00064
Illinois Certification #: 200011
Iowa Certification #: 368
Kansas Certification #: E-10167
Louisiana Certification #: 03086
Louisiana Certification #: LA080009
Maine Certification #: 2007029
Maryland Certification #: 322
Michigan DEQ Certification #: 9909
Minnesota Certification #: 027-053-137
Mississippi Certification #: Pace
Montana Certification #: MT CERT0092
Nevada Certification #: MN_00064
Nebraska Certification #: Pace
New Jersey Certification #: MN-002
New Mexico Certification #: Pace
New York Certification #: 11647
North Carolina Certification #: 530
North Dakota Certification #: R-036
North Dakota Certification #: R-036A
Ohio VAP Certification #: CL101
Oklahoma Certification #: D9921
Oklahoma Certification #: 9507
Oregon Certification #: MN200001
Pennsylvania Certification #: 68-00563
Puerto Rico Certification
Tennessee Certification #: 02818
Texas Certification #: T104704192
Washington Certification #: C754
Wisconsin Certification #: 999407970

Montana Certification IDs

602 South 25th Street, Billings, MT 59101
EPA Region 8 Certification #: 8TMS-Q
Idaho Certification #: MT00012
Montana Certification #: MT CERT0040
NVLAP Certification #: 101292-0
Minnesota Dept of Health Certification #: 030-999-442

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SAMPLE SUMMARY

Project: REVISED - Black Pine Mine REV
Pace Project No.: 10160756

Lab ID	Sample ID	Matrix	Date Collected	Date Received
10160756001	**CML-SW-14**	Water	06/15/11 13:29	06/17/11 08:50
10160756002	**CML-SW-19**	Water	06/15/11 12:59	06/17/11 08:50
10160756003	**CML-SW-02**	Water	06/15/11 14:03	06/17/11 08:50
10160756004	**CML-Q1-T2**	Water	06/15/11 14:03	06/17/11 08:50
10160756005	**CML-SW-01**	Water	06/15/11 15:49	06/17/11 08:50
10160756006	**CML-SW-09**	Water	06/15/11 15:13	06/17/11 08:50
10160756007	**CML-SD-15-00**	Solid	06/16/11 09:55	06/17/11 08:50
10160756008	**CML-SD-13-00**	Solid	06/16/11 09:20	06/17/11 08:50
10160756009	**CML-SD-17-00**	Solid	06/16/11 10:40	06/17/11 08:50
10160756010	**CML-SD-14-00**	Solid	06/16/11 09:30	06/17/11 08:50
10160756011	**CML-SD-16-00**	Solid	06/16/11 10:30	06/17/11 08:50

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SAMPLE ANALYTE COUNT

Project: REVISED - Black Pine Mine REV
Pace Project No.: 10160756

Lab ID	Sample ID	Method	Analysts	Analytes Reported	Laboratory
10160756001	**CML-SW-14**	EPA 200.8	RJS	12	PASI-M
		SM 2310	CAC	1	PASI-MT
		SM 2540D	SR1	1	PASI-MT
		EPA 300.0	JH1	1	PASI-MT
		SM 2320B	MWD	1	PASI-M
		SM 2540C	CAP	1	PASI-M
10160756002	**CML-SW-19**	EPA 200.8	RJS	12	PASI-M
		SM 2310	CAC	1	PASI-MT
		SM 2540D	SR1	1	PASI-MT
		EPA 300.0	JH1	1	PASI-MT
		SM 2320B	MWD	1	PASI-M
		SM 2540C	CAP	1	PASI-M
10160756003	**CML-SW-02**	EPA 200.8	RJS	12	PASI-M
		SM 2310	CAC	1	PASI-MT
		SM 2540D	SR1	1	PASI-MT
		EPA 300.0	JH1	1	PASI-MT
		SM 2320B	MWD	1	PASI-M
		SM 2540C	CAP	1	PASI-M
10160756004	**CML-Q1-T2**	EPA 200.8	RJS	12	PASI-M
10160756005	**CML-SW-01**	EPA 200.8	RJS	12	PASI-M
		SM 2310	CAC	1	PASI-MT
		SM 2540D	SR1	1	PASI-MT
		EPA 300.0	JH1	1	PASI-MT
		SM 2320B	MWD	1	PASI-M
		SM 2540C	CAP	1	PASI-M
10160756006	**CML-SW-09**	EPA 200.8	RJS	12	PASI-M
		SM 2310	CAC	1	PASI-MT
		SM 2540D	SR1	1	PASI-MT
		EPA 300.0	JH1	1	PASI-MT
		SM 2320B	MWD	1	PASI-M
		SM 2540C	CAP	1	PASI-M
10160756007	**CML-SD-15-00**	EPA 6020	CJS, TL1	12	PASI-M
		EPA 7471	TEM	1	PASI-M
		% Moisture	JDL	1	PASI-M
10160756008	**CML-SD-13-00**	EPA 6020	CJS, TL1	12	PASI-M
		EPA 7471	TEM	1	PASI-M
		% Moisture	JDL	1	PASI-M

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SAMPLE ANALYTE COUNT

Project: REVISED - Black Pine Mine REV
Pace Project No.: 10160756

Lab ID	Sample ID	Method	Analysts	Analytes Reported	Laboratory
10160756009	**CML-SD-17-00**	EPA 6020	CJS, TL1	12	PASI-M
		EPA 7471	TEM	1	PASI-M
		% Moisture	JDL	1	PASI-M
10160756010	**CML-SD-14-00**	EPA 6020	CJS, TL1	12	PASI-M
		EPA 7471	TEM	1	PASI-M
		% Moisture	JDL	1	PASI-M
10160756011	**CML-SD-16-00**	EPA 6020	CJS, TL1	12	PASI-M
		EPA 7471	TEM	1	PASI-M
		% Moisture	JDL	1	PASI-M

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PROJECT NARRATIVE

Project: REVISED - Black Pine Mine REV
Pace Project No.: 10160756

Method: **EPA 200.8**
Description: 200.8 MET ICPMS
Client: Montana Dept. of Environmental Quality
Date: October 13, 2011

General Information:
6 samples were analyzed for EPA 200.8. All samples were received in acceptable condition with any exceptions noted below.

Hold Time:
The samples were analyzed within the method required hold times with any exceptions noted below.

Sample Preparation:
The samples were prepared in accordance with EPA 200.8 with any exceptions noted below.

Initial Calibrations (including MS Tune as applicable):
All criteria were within method requirements with any exceptions noted below.

Continuing Calibration:
All criteria were within method requirements with any exceptions noted below.

Internal Standards:
All internal standards were within QC limits with any exceptions noted below.

Method Blank:
All analytes were below the report limit in the method blank with any exceptions noted below.

Laboratory Control Spike:
All laboratory control spike compounds were within QC limits with any exceptions noted below.

Matrix Spikes:
All percent recoveries and relative percent differences (RPDs) were within acceptance criteria with any exceptions noted below.

QC Batch: MPRP/26758

A matrix spike and matrix spike duplicate (MS/MSD) were performed on the following sample(s): 10160756005,9296528001

M0: Matrix spike recovery and/or matrix spike duplicate recovery was outside laboratory control limits.

- MS (Lab ID: 1001302)
  - Iron
- MS (Lab ID: 999082)
  - Iron

M1: Matrix spike recovery exceeded QC limits. Batch accepted based on laboratory control sample (LCS) recovery.

- MS (Lab ID: 999082)
  - Silver

Duplicate Sample:
All duplicate sample results were within method acceptance criteria with any exceptions noted below.

Additional Comments:

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PROJECT NARRATIVE

Project: REVISED - Black Pine Mine REV
Pace Project No.: 10160756

Method: **EPA 6020**
Description: 6020 MET ICPMS
Client: Montana Dept. of Environmental Quality
Date: October 13, 2011

General Information:
5 samples were analyzed for EPA 6020. All samples were received in acceptable condition with any exceptions noted below.

Hold Time:
The samples were analyzed within the method required hold times with any exceptions noted below.

Sample Preparation:
The samples were prepared in accordance with EPA 3050 with any exceptions noted below.

Initial Calibrations (including MS Tune as applicable):
All criteria were within method requirements with any exceptions noted below.

Continuing Calibration:
All criteria were within method requirements with any exceptions noted below.

Internal Standards:
All internal standards were within QC limits with any exceptions noted below.

Method Blank:
All analytes were below the report limit in the method blank with any exceptions noted below.

Laboratory Control Spike:
All laboratory control spike compounds were within QC limits with any exceptions noted below.

Matrix Spikes:
All percent recoveries and relative percent differences (RPDs) were within acceptance criteria with any exceptions noted below.

QC Batch: MPRP/26730

A matrix spike and matrix spike duplicate (MS/MSD) were performed on the following sample(s): 10160501002,258133003

M6: Matrix spike and Matrix spike duplicate recovery not evaluated against control limits due to sample dilution.

- MS (Lab ID: 998311)
  - Barium
  - Copper
  - Iron
  - Manganese
  - Zinc
- MS (Lab ID: 998313)
  - Antimony
  - Barium
  - Iron
  - Manganese
- MSD (Lab ID: 998312)
  - Antimony
  - Barium

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PROJECT NARRATIVE

Project: REVISED - Black Pine Mine REV
Pace Project No.: 10160756

Method: **EPA 6020**
Description: 6020 MET ICPMS
Client: Montana Dept. of Environmental Quality
Date: October 13, 2011

QC Batch: MPRP/26730

A matrix spike and matrix spike duplicate (MS/MSD) were performed on the following sample(s): 10160501002,258133003

M6: Matrix spike and Matrix spike duplicate recovery not evaluated against control limits due to sample dilution.

- Chromium
- Iron
- Manganese

Duplicate Sample:
All duplicate sample results were within method acceptance criteria with any exceptions noted below.

Additional Comments:

Analyte Comments:

QC Batch: MPRP/26730

E: Analyte concentration exceeded the calibration range. The reported result is estimated.

- MS (Lab ID: 998311)
  - Manganese
- MSD (Lab ID: 998312)
  - Manganese

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PROJECT NARRATIVE

Project: REVISED - Black Pine Mine REV
Pace Project No.: 10160756

Method: **EPA 7471**
Description: 7471 Mercury
Client: Montana Dept. of Environmental Quality
Date: October 13, 2011

General Information:
5 samples were analyzed for EPA 7471. All samples were received in acceptable condition with any exceptions noted below.

Hold Time:
The samples were analyzed within the method required hold times with any exceptions noted below.

Sample Preparation:
The samples were prepared in accordance with EPA 7471 with any exceptions noted below.

Initial Calibrations (including MS Tune as applicable):
All criteria were within method requirements with any exceptions noted below.

Continuing Calibration:
All criteria were within method requirements with any exceptions noted below.

Method Blank:
All analytes were below the report limit in the method blank with any exceptions noted below.

Laboratory Control Spike:
All laboratory control spike compounds were within QC limits with any exceptions noted below.

Matrix Spikes:
All percent recoveries and relative percent differences (RPDs) were within acceptance criteria with any exceptions noted below.

QC Batch: MERP/5556

A matrix spike and matrix spike duplicate (MS/MSD) were performed on the following sample(s): 10160647003,10161056004

M1: Matrix spike recovery exceeded QC limits. Batch accepted based on laboratory control sample (LCS) recovery.

- MS (Lab ID: 1000722)
  - Mercury

Duplicate Sample:
All duplicate sample results were within method acceptance criteria with any exceptions noted below.

Additional Comments:

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PROJECT NARRATIVE

Project: REVISED - Black Pine Mine REV
Pace Project No.: 10160756

Method: **SM 2310**
Description: 2310 Acidity
Client: Montana Dept. of Environmental Quality
Date: October 13, 2011

General Information:
5 samples were analyzed for SM 2310. All samples were received in acceptable condition with any exceptions noted below.

Hold Time:
The samples were analyzed within the method required hold times with any exceptions noted below.

Initial Calibrations (including MS Tune as applicable):
All criteria were within method requirements with any exceptions noted below.

Continuing Calibration:
All criteria were within method requirements with any exceptions noted below.

Internal Standards:
All internal standards were within QC limits with any exceptions noted below.

Surrogates:
All surrogates were within QC limits with any exceptions noted below.

Method Blank:
All analytes were below the report limit in the method blank with any exceptions noted below.

Laboratory Control Spike:
All laboratory control spike compounds were within QC limits with any exceptions noted below.

Matrix Spikes:
All percent recoveries and relative percent differences (RPDs) were within acceptance criteria with any exceptions noted below.

Duplicate Sample:
All duplicate sample results were within method acceptance criteria with any exceptions noted below.

Additional Comments:

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PROJECT NARRATIVE

Project: REVISED - Black Pine Mine REV
Pace Project No.: 10160756

Method: **SM 2540D**
Description: 2540D Total Suspended Solids
Client: Montana Dept. of Environmental Quality
Date: October 13, 2011

General Information:
5 samples were analyzed for SM 2540D. All samples were received in acceptable condition with any exceptions noted below.

Hold Time:
The samples were analyzed within the method required hold times with any exceptions noted below.

Initial Calibrations (including MS Tune as applicable):
All criteria were within method requirements with any exceptions noted below.

Continuing Calibration:
All criteria were within method requirements with any exceptions noted below.

Internal Standards:
All internal standards were within QC limits with any exceptions noted below.

Surrogates:
All surrogates were within QC limits with any exceptions noted below.

Method Blank:
All analytes were below the report limit in the method blank with any exceptions noted below.

Laboratory Control Spike:
All laboratory control spike compounds were within QC limits with any exceptions noted below.

Matrix Spikes:
All percent recoveries and relative percent differences (RPDs) were within acceptance criteria with any exceptions noted below.

Duplicate Sample:
All duplicate sample results were within method acceptance criteria with any exceptions noted below.

Additional Comments:

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PROJECT NARRATIVE

Project: REVISED - Black Pine Mine REV
Pace Project No.: 10160756

Method: **EPA 300.0**
Description: 300.0 IC Anions
Client: Montana Dept. of Environmental Quality
Date: October 13, 2011

General Information:
5 samples were analyzed for EPA 300.0. All samples were received in acceptable condition with any exceptions noted below.

Hold Time:
The samples were analyzed within the method required hold times with any exceptions noted below.

Initial Calibrations (including MS Tune as applicable):
All criteria were within method requirements with any exceptions noted below.

Continuing Calibration:
All criteria were within method requirements with any exceptions noted below.

Internal Standards:
All internal standards were within QC limits with any exceptions noted below.

Surrogates:
All surrogates were within QC limits with any exceptions noted below.

Method Blank:
All analytes were below the report limit in the method blank with any exceptions noted below.

Laboratory Control Spike:
All laboratory control spike compounds were within QC limits with any exceptions noted below.

Matrix Spikes:
All percent recoveries and relative percent differences (RPDs) were within acceptance criteria with any exceptions noted below.

Duplicate Sample:
All duplicate sample results were within method acceptance criteria with any exceptions noted below.

Additional Comments:

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PROJECT NARRATIVE

Project: REVISED - Black Pine Mine REV
Pace Project No.: 10160756

Method: **SM 2320B**
Description: 2320B Alkalinity
Client: Montana Dept. of Environmental Quality
Date: October 13, 2011

General Information:
5 samples were analyzed for SM 2320B. All samples were received in acceptable condition with any exceptions noted below.

Hold Time:
The samples were analyzed within the method required hold times with any exceptions noted below.

Method Blank:
All analytes were below the report limit in the method blank with any exceptions noted below.

Laboratory Control Spike:
All laboratory control spike compounds were within QC limits with any exceptions noted below.

Matrix Spikes:
All percent recoveries and relative percent differences (RPDs) were within acceptance criteria with any exceptions noted below.

QC Batch: WET/22702

A matrix spike and matrix spike duplicate (MS/MSD) were performed on the following sample(s): 10160702001,10161012002

M1: Matrix spike recovery exceeded QC limits. Batch accepted based on laboratory control sample (LCS) recovery.

- MS (Lab ID: 1000795)
  - Alkalinity, Total as CaCO3

Duplicate Sample:
All duplicate sample results were within method acceptance criteria with any exceptions noted below.

Additional Comments:

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PROJECT NARRATIVE

Project: REVISED - Black Pine Mine REV
Pace Project No.: 10160756

Method: **SM 2540C**
Description: 2540C Total Dissolved Solids
Client: Montana Dept. of Environmental Quality
Date: October 13, 2011

General Information:
5 samples were analyzed for SM 2540C. All samples were received in acceptable condition with any exceptions noted below.

Hold Time:
The samples were analyzed within the method required hold times with any exceptions noted below.

Method Blank:
All analytes were below the report limit in the method blank with any exceptions noted below.

Laboratory Control Spike:
All laboratory control spike compounds were within QC limits with any exceptions noted below.

Matrix Spikes:
All percent recoveries and relative percent differences (RPDs) were within acceptance criteria with any exceptions noted below.

Duplicate Sample:
All duplicate sample results were within method acceptance criteria with any exceptions noted below.

Additional Comments:

This data package has been reviewed for quality and completeness and is approved for release.

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ANALYTICAL RESULTS

Project: REVISED - Black Pine Mine REV
Pace Project No.: 10160756

Sample: CML-SW-14 **Lab ID: 10160756001** Collected: 06/15/11 13:29 Received: 06/17/11 08:50 Matrix: Water

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
200.8 MET ICPMS	Analytical Method: EPA 200.8 Preparation Method: EPA 200.8							
Antimony	**<0.50**	ug/L	0.50	1	06/23/11 15:57	06/28/11 14:12	7440-36-0	
Arsenic	**0.51**	ug/L	0.50	1	06/23/11 15:57	06/28/11 14:12	7440-38-2	
Barium	**38.6**	ug/L	0.30	1	06/23/11 15:57	06/28/11 14:12	7440-39-3	
Cadmium	**<0.080**	ug/L	0.080	1	06/23/11 15:57	06/28/11 14:12	7440-43-9	
Chromium	**0.64**	ug/L	0.50	1	06/23/11 15:57	06/28/11 14:12	7440-47-3	
Copper	**3.5**	ug/L	0.50	1	06/23/11 15:57	06/28/11 14:12	7440-50-8	
Iron	**442**	ug/L	50.0	1	06/23/11 15:57	06/28/11 14:12	7439-89-6	
Lead	**0.36**	ug/L	0.10	1	06/23/11 15:57	06/28/11 14:12	7439-92-1	
Manganese	**8.1**	ug/L	0.50	1	06/23/11 15:57	06/28/11 14:12	7439-96-5	
Nickel	**0.57**	ug/L	0.50	1	06/23/11 15:57	06/28/11 14:12	7440-02-0	
Silver	**<0.50**	ug/L	0.50	1	06/23/11 15:57	06/28/11 14:12	7440-22-4	
Zinc	**<5.0**	ug/L	5.0	1	06/23/11 15:57	06/28/11 14:12	7440-66-6	
2310 Acidity	Analytical Method: SM 2310							
Acidity	**6.3**	mg/L	5.0	1		06/24/11 16:55		
2540D Total Suspended Solids	Analytical Method: SM 2540D							
Total Suspended Solids	**1.9**	mg/L	1.0	1		06/21/11 16:47		
300.0 IC Anions	Analytical Method: EPA 300.0							
Sulfate	**2.5**	mg/L	1.0	1		06/28/11 19:58	14808-79-8	
2320B Alkalinity	Analytical Method: SM 2320B							
Alkalinity, Total as CaCO3	**7.8**	mg/L	5.0	1		06/23/11 13:33		
2540C Total Dissolved Solids	Analytical Method: SM 2540C							
Total Dissolved Solids	**31.0**	mg/L	10.0	1		06/22/11 11:30		

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ANALYTICAL RESULTS

Project: REVISED - Black Pine Mine REV
Pace Project No.: 10160756

Sample: CML-SW-19 **Lab ID: 10160756002** Collected: 06/15/11 12:59 Received: 06/17/11 08:50 Matrix: Water

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
200.8 MET ICPMS	Analytical Method: EPA 200.8 Preparation Method: EPA 200.8							
Antimony	**<0.50**	ug/L	0.50	1	06/23/11 15:57	06/28/11 14:16	7440-36-0	
Arsenic	**<0.50**	ug/L	0.50	1	06/23/11 15:57	06/28/11 14:16	7440-38-2	
Barium	**44.6**	ug/L	0.30	1	06/23/11 15:57	06/28/11 14:16	7440-39-3	
Cadmium	**<0.080**	ug/L	0.080	1	06/23/11 15:57	06/28/11 14:16	7440-43-9	
Chromium	**0.69**	ug/L	0.50	1	06/23/11 15:57	06/28/11 14:16	7440-47-3	
Copper	**3.6**	ug/L	0.50	1	06/23/11 15:57	06/28/11 14:16	7440-50-8	
Iron	**308**	ug/L	50.0	1	06/23/11 15:57	06/28/11 14:16	7439-89-6	
Lead	**0.37**	ug/L	0.10	1	06/23/11 15:57	06/28/11 14:16	7439-92-1	
Manganese	**4.1**	ug/L	0.50	1	06/23/11 15:57	06/28/11 14:16	7439-96-5	
Nickel	**0.61**	ug/L	0.50	1	06/23/11 15:57	06/28/11 14:16	7440-02-0	
Silver	**<0.50**	ug/L	0.50	1	06/23/11 15:57	06/28/11 14:16	7440-22-4	
Zinc	**<5.0**	ug/L	5.0	1	06/23/11 15:57	06/28/11 14:16	7440-66-6	
2310 Acidity	Analytical Method: SM 2310							
Acidity	**10.1**	mg/L	5.0	1		06/24/11 16:55		
2540D Total Suspended Solids	Analytical Method: SM 2540D							
Total Suspended Solids	**1.3**	mg/L	1.0	1		06/21/11 16:47		
300.0 IC Anions	Analytical Method: EPA 300.0							
Sulfate	**2.4**	mg/L	1.0	1		06/28/11 20:27	14808-79-8	
2320B Alkalinity	Analytical Method: SM 2320B							
Alkalinity, Total as CaCO3	**7.6**	mg/L	5.0	1		06/23/11 13:36		
2540C Total Dissolved Solids	Analytical Method: SM 2540C							
Total Dissolved Solids	**32.0**	mg/L	10.0	1		06/22/11 11:30		

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ANALYTICAL RESULTS

Project: REVISED - Black Pine Mine REV
Pace Project No.: 10160756

Sample: CML-SW-02 **Lab ID: 10160756003** Collected: 06/15/11 14:03 Received: 06/17/11 08:50 Matrix: Water

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
200.8 MET ICPMS	Analytical Method: EPA 200.8 Preparation Method: EPA 200.8							
Antimony	**1.7**	ug/L	0.50	1	06/23/11 15:57	06/28/11 14:21	7440-36-0	
Arsenic	**1.2**	ug/L	0.50	1	06/23/11 15:57	06/28/11 14:21	7440-38-2	
Barium	**43.5**	ug/L	0.30	1	06/23/11 15:57	06/28/11 14:21	7440-39-3	
Cadmium	**0.095**	ug/L	0.080	1	06/23/11 15:57	06/28/11 14:21	7440-43-9	
Chromium	**0.71**	ug/L	0.50	1	06/23/11 15:57	06/28/11 14:21	7440-47-3	
Copper	**14.0**	ug/L	0.50	1	06/23/11 15:57	06/28/11 14:21	7440-50-8	
Iron	**420**	ug/L	50.0	1	06/23/11 15:57	06/28/11 14:21	7439-89-6	
Lead	**5.1**	ug/L	0.10	1	06/23/11 15:57	06/28/11 14:21	7439-92-1	
Manganese	**10.4**	ug/L	0.50	1	06/23/11 15:57	06/28/11 14:21	7439-96-5	
Nickel	**0.77**	ug/L	0.50	1	06/23/11 15:57	06/28/11 14:21	7440-02-0	
Silver	**<0.50**	ug/L	0.50	1	06/23/11 15:57	06/28/11 14:21	7440-22-4	
Zinc	**7.0**	ug/L	5.0	1	06/23/11 15:57	06/28/11 14:21	7440-66-6	
2310 Acidity	Analytical Method: SM 2310							
Acidity	**21.5**	mg/L	5.0	1		06/24/11 16:55		
2540D Total Suspended Solids	Analytical Method: SM 2540D							
Total Suspended Solids	**1.7**	mg/L	1.0	1		06/21/11 16:47		
300.0 IC Anions	Analytical Method: EPA 300.0							
Sulfate	**2.8**	mg/L	1.0	1		06/28/11 20:55	14808-79-8	
2320B Alkalinity	Analytical Method: SM 2320B							
Alkalinity, Total as CaCO3	**7.7**	mg/L	5.0	1		06/23/11 13:39		
2540C Total Dissolved Solids	Analytical Method: SM 2540C							
Total Dissolved Solids	**37.0**	mg/L	10.0	1		06/22/11 11:31		

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ANALYTICAL RESULTS

Project: REVISED - Black Pine Mine REV
Pace Project No.: 10160756

Sample: CML-Q1-T2 **Lab ID: 10160756004** Collected: 06/15/11 14:03 Received: 06/17/11 08:50 Matrix: Water

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
200.8 MET ICPMS	Analytical Method: EPA 200.8 Preparation Method: EPA 200.8							
Antimony	**1.3**	ug/L	0.50	1	06/23/11 15:57	06/28/11 14:26	7440-36-0	
Arsenic	**0.80**	ug/L	0.50	1	06/23/11 15:57	06/28/11 14:26	7440-38-2	
Barium	**41.3**	ug/L	0.30	1	06/23/11 15:57	06/28/11 14:26	7440-39-3	
Cadmium	**<0.080**	ug/L	0.080	1	06/23/11 15:57	06/28/11 14:26	7440-43-9	
Chromium	**1.1**	ug/L	0.50	1	06/23/11 15:57	06/28/11 14:26	7440-47-3	
Copper	**9.9**	ug/L	0.50	1	06/23/11 15:57	06/28/11 14:26	7440-50-8	
Iron	**562**	ug/L	50.0	1	06/23/11 15:57	06/28/11 14:26	7439-89-6	
Lead	**1.0**	ug/L	0.10	1	06/23/11 15:57	06/28/11 14:26	7439-92-1	
Manganese	**6.8**	ug/L	0.50	1	06/23/11 15:57	06/28/11 14:26	7439-96-5	
Nickel	**0.85**	ug/L	0.50	1	06/23/11 15:57	06/28/11 14:26	7440-02-0	
Silver	**<0.50**	ug/L	0.50	1	06/23/11 15:57	06/28/11 14:26	7440-22-4	
Zinc	**5.9**	ug/L	5.0	1	06/23/11 15:57	06/28/11 14:26	7440-66-6	

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ANALYTICAL RESULTS

Project: REVISED - Black Pine Mine REV
Pace Project No.: 10160756

Sample: CML-SW-01 **Lab ID: 10160756005** Collected: 06/15/11 15:49 Received: 06/17/11 08:50 Matrix: Water

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
200.8 MET ICPMS	Analytical Method: EPA 200.8 Preparation Method: EPA 200.8							
Antimony	**3.4**	ug/L	0.50	1	06/23/11 15:57	06/28/11 06:52	7440-36-0	
Arsenic	**1.7**	ug/L	0.50	1	06/23/11 15:57	06/28/11 06:52	7440-38-2	
Barium	**36.6**	ug/L	0.30	1	06/23/11 15:57	06/28/11 06:52	7440-39-3	
Cadmium	**0.15**	ug/L	0.080	1	06/23/11 15:57	06/28/11 06:52	7440-43-9	
Chromium	**0.83**	ug/L	0.50	1	06/23/11 15:57	06/28/11 06:52	7440-47-3	
Copper	**17.4**	ug/L	0.50	1	06/23/11 15:57	06/28/11 06:52	7440-50-8	
Iron	**617**	ug/L	50.0	1	06/23/11 15:57	06/28/11 06:52	7439-89-6	M0
Lead	**3.8**	ug/L	0.10	1	06/23/11 15:57	06/28/11 06:52	7439-92-1	
Manganese	**7.1**	ug/L	0.50	1	06/23/11 15:57	06/28/11 06:52	7439-96-5	
Nickel	**0.88**	ug/L	0.50	1	06/23/11 15:57	06/28/11 06:52	7440-02-0	
Silver	**<0.50**	ug/L	0.50	1	06/23/11 15:57	06/28/11 06:52	7440-22-4	
Zinc	**14.2**	ug/L	5.0	1	06/23/11 15:57	06/28/11 06:52	7440-66-6	
2310 Acidity	Analytical Method: SM 2310							
Acidity	**21.5**	mg/L	5.0	1		06/24/11 16:55		
2540D Total Suspended Solids	Analytical Method: SM 2540D							
Total Suspended Solids	**1.4**	mg/L	1.0	1		06/21/11 16:47		
300.0 IC Anions	Analytical Method: EPA 300.0							
Sulfate	**3.5**	mg/L	1.0	1		06/28/11 21:24	14808-79-8	
2320B Alkalinity	Analytical Method: SM 2320B							
Alkalinity, Total as CaCO3	**6.8**	mg/L	5.0	1		06/23/11 13:43		
2540C Total Dissolved Solids	Analytical Method: SM 2540C							
Total Dissolved Solids	**39.0**	mg/L	10.0	1		06/22/11 11:31		

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ANALYTICAL RESULTS

Project: REVISED - Black Pine Mine REV
Pace Project No.: 10160756

Sample: CML-SW-09 **Lab ID: 10160756006** Collected: 06/15/11 15:13 Received: 06/17/11 08:50 Matrix: Water

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
200.8 MET ICPMS	Analytical Method: EPA 200.8 Preparation Method: EPA 200.8							
Antimony	**3.0**	ug/L	0.50	1	06/23/11 15:57	06/28/11 14:31	7440-36-0	
Arsenic	**1.4**	ug/L	0.50	1	06/23/11 15:57	06/28/11 14:31	7440-38-2	
Barium	**36.2**	ug/L	0.30	1	06/23/11 15:57	06/28/11 14:31	7440-39-3	
Cadmium	**0.13**	ug/L	0.080	1	06/23/11 15:57	06/28/11 14:31	7440-43-9	
Chromium	**0.83**	ug/L	0.50	1	06/23/11 15:57	06/28/11 14:31	7440-47-3	
Copper	**15.8**	ug/L	0.50	1	06/23/11 15:57	06/28/11 14:31	7440-50-8	
Iron	**406**	ug/L	50.0	1	06/23/11 15:57	06/28/11 14:31	7439-89-6	
Lead	**2.9**	ug/L	0.10	1	06/23/11 15:57	06/28/11 14:31	7439-92-1	
Manganese	**6.1**	ug/L	0.50	1	06/23/11 15:57	06/28/11 14:31	7439-96-5	
Nickel	**0.84**	ug/L	0.50	1	06/23/11 15:57	06/28/11 14:31	7440-02-0	
Silver	**<0.50**	ug/L	0.50	1	06/23/11 15:57	06/28/11 14:31	7440-22-4	
Zinc	**11.8**	ug/L	5.0	1	06/23/11 15:57	06/28/11 14:31	7440-66-6	
2310 Acidity	Analytical Method: SM 2310							
Acidity	**17.7**	mg/L	5.0	1		06/24/11 16:55		
2540D Total Suspended Solids	Analytical Method: SM 2540D							
Total Suspended Solids	**2.3**	mg/L	1.0	1		06/21/11 16:47		
300.0 IC Anions	Analytical Method: EPA 300.0							
Sulfate	**3.5**	mg/L	1.0	1		06/29/11 01:12	14808-79-8	
2320B Alkalinity	Analytical Method: SM 2320B							
Alkalinity, Total as CaCO3	**6.5**	mg/L	5.0	1		06/23/11 13:53		
2540C Total Dissolved Solids	Analytical Method: SM 2540C							
Total Dissolved Solids	**35.0**	mg/L	10.0	1		06/22/11 11:32		

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ANALYTICAL RESULTS

Project: REVISED - Black Pine Mine REV
Pace Project No.: 10160756

Sample: CML-SD-15-00 **Lab ID: 10160756007** Collected: 06/16/11 09:55 Received: 06/17/11 08:50 Matrix: Solid

Results reported on a "dry-weight" basis

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
6020 MET ICPMS	Analytical Method: EPA 6020 Preparation Method: EPA 3050							
Antimony	**1300**	mg/kg	11.9	400	06/28/11 17:50	06/30/11 12:14	7440-36-0	
Arsenic	**1250**	mg/kg	1.5	50	06/28/11 17:50	06/30/11 12:11	7440-38-2	
Barium	**1030**	mg/kg	0.90	50	06/28/11 17:50	06/30/11 12:11	7440-39-3	
Cadmium	**32.5**	mg/kg	0.096	20	06/28/11 17:50	06/29/11 15:06	7440-43-9	
Chromium	**6.5**	mg/kg	0.60	20	06/28/11 17:50	06/29/11 15:06	7440-47-3	
Cobalt	**1.9**	mg/kg	0.60	20	06/28/11 17:50	06/29/11 15:06	7440-48-4	
Copper	**4810**	mg/kg	11.9	400	06/28/11 17:50	06/30/11 12:14	7440-50-8	
Iron	**35900**	mg/kg	149	50	06/28/11 17:50	06/30/11 12:11	7439-89-6	
Lead	**8050**	mg/kg	2.4	400	06/28/11 17:50	06/30/11 12:14	7439-92-1	
Manganese	**342**	mg/kg	0.60	20	06/28/11 17:50	06/29/11 15:06	7439-96-5	
Nickel	**4.1**	mg/kg	0.60	20	06/28/11 17:50	06/29/11 15:06	7440-02-0	
Zinc	**1300**	mg/kg	119	400	06/28/11 17:50	06/30/11 12:14	7440-66-6	
7471 Mercury	Analytical Method: EPA 7471 Preparation Method: EPA 7471							
Mercury	**9.2**	mg/kg	0.60	20	06/27/11 11:04	06/27/11 15:37	7439-97-6	
Dry Weight	Analytical Method: % Moisture							
Percent Moisture	**35.1**	%	0.10	1		06/27/11 00:00		

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ANALYTICAL RESULTS

Project: REVISED - Black Pine Mine REV
Pace Project No.: 10160756

Sample: CML-SD-13-00 **Lab ID: 10160756008** Collected: 06/16/11 09:20 Received: 06/17/11 08:50 Matrix: Solid

Results reported on a "dry-weight" basis

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
6020 MET ICPMS	Analytical Method: EPA 6020 Preparation Method: EPA 3050							
Antimony	**440**	mg/kg	0.71	20	06/28/11 17:50	06/29/11 15:09	7440-36-0	
Arsenic	**339**	mg/kg	0.71	20	06/28/11 17:50	06/29/11 15:09	7440-38-2	
Barium	**229**	mg/kg	0.43	20	06/28/11 17:50	06/29/11 15:09	7440-39-3	
Cadmium	**7.7**	mg/kg	0.11	20	06/28/11 17:50	06/29/11 15:09	7440-43-9	
Chromium	**7.5**	mg/kg	0.71	20	06/28/11 17:50	06/29/11 15:09	7440-47-3	
Cobalt	**12.7**	mg/kg	0.71	20	06/28/11 17:50	06/29/11 15:09	7440-48-4	
Copper	**1210**	mg/kg	1.8	50	06/28/11 17:50	06/30/11 12:17	7440-50-8	
Iron	**17300**	mg/kg	71.0	20	06/28/11 17:50	06/29/11 15:09	7439-89-6	
Lead	**1690**	mg/kg	2.8	400	06/28/11 17:50	06/30/11 12:21	7439-92-1	
Manganese	**741**	mg/kg	1.8	50	06/28/11 17:50	06/30/11 12:17	7439-96-5	
Nickel	**6.9**	mg/kg	0.71	20	06/28/11 17:50	06/29/11 15:09	7440-02-0	
Zinc	**257**	mg/kg	7.1	20	06/28/11 17:50	06/29/11 15:09	7440-66-6	
7471 Mercury	Analytical Method: EPA 7471 Preparation Method: EPA 7471							
Mercury	**17.4**	mg/kg	0.61	20	06/27/11 11:04	06/27/11 15:45	7439-97-6	
Dry Weight	Analytical Method: % Moisture							
Percent Moisture	**38.2**	%	0.10	1		06/27/11 00:00		

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ANALYTICAL RESULTS

Project: REVISED - Black Pine Mine REV
Pace Project No.: 10160756

Sample: CML-SD-17-00 **Lab ID: 10160756009** Collected: 06/16/11 10:40 Received: 06/17/11 08:50 Matrix: Solid

Results reported on a "dry-weight" basis

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
6020 MET ICPMS	Analytical Method: EPA 6020 Preparation Method: EPA 3050							
Antimony	**1090**	mg/kg	8.0	200	06/28/11 17:50	06/30/11 12:28	7440-36-0	
Arsenic	**745**	mg/kg	1.0	25	06/28/11 17:50	06/30/11 12:24	7440-38-2	
Barium	**317**	mg/kg	0.48	20	06/28/11 17:50	06/29/11 13:37	7440-39-3	
Cadmium	**17.1**	mg/kg	0.13	20	06/28/11 17:50	06/29/11 13:37	7440-43-9	
Chromium	**3.8**	mg/kg	0.80	20	06/28/11 17:50	06/29/11 13:37	7440-47-3	
Cobalt	**3.1**	mg/kg	0.80	20	06/28/11 17:50	06/29/11 13:37	7440-48-4	
Copper	**1910**	mg/kg	8.0	200	06/28/11 17:50	06/30/11 12:28	7440-50-8	
Iron	**23800**	mg/kg	79.8	20	06/28/11 17:50	06/29/11 13:37	7439-89-6	
Lead	**3880**	mg/kg	1.6	200	06/28/11 17:50	06/30/11 12:28	7439-92-1	
Manganese	**325**	mg/kg	0.80	20	06/28/11 17:50	06/29/11 13:37	7439-96-5	
Nickel	**2.5**	mg/kg	0.80	20	06/28/11 17:50	06/29/11 13:37	7440-02-0	
Zinc	**496**	mg/kg	8.0	20	06/28/11 17:50	06/29/11 13:37	7440-66-6	
7471 Mercury	Analytical Method: EPA 7471 Preparation Method: EPA 7471							
Mercury	**10.5**	mg/kg	0.27	10	06/27/11 11:04	06/27/11 16:01	7439-97-6	
Dry Weight	Analytical Method: % Moisture							
Percent Moisture	**38.6**	%	0.10	1		06/27/11 00:00		

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ANALYTICAL RESULTS

Project: REVISED - Black Pine Mine REV
Pace Project No.: 10160756

Sample: CML-SD-14-00 **Lab ID: 10160756010** Collected: 06/16/11 09:30 Received: 06/17/11 08:50 Matrix: Solid

Results reported on a "dry-weight" basis

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
6020 MET ICPMS	Analytical Method: EPA 6020 Preparation Method: EPA 3050							
Antimony	**1010**	mg/kg	6.8	200	06/28/11 17:50	06/30/11 12:55	7440-36-0	
Arsenic	**668**	mg/kg	0.84	25	06/28/11 17:50	06/30/11 12:31	7440-38-2	
Barium	**304**	mg/kg	0.41	20	06/28/11 17:50	06/29/11 13:40	7440-39-3	
Cadmium	**14.7**	mg/kg	0.11	20	06/28/11 17:50	06/29/11 13:40	7440-43-9	
Chromium	**4.9**	mg/kg	0.68	20	06/28/11 17:50	06/29/11 13:40	7440-47-3	
Cobalt	**3.6**	mg/kg	0.68	20	06/28/11 17:50	06/29/11 13:40	7440-48-4	
Copper	**2230**	mg/kg	6.8	200	06/28/11 17:50	06/30/11 12:55	7440-50-8	
Iron	**21700**	mg/kg	67.6	20	06/28/11 17:50	06/29/11 13:40	7439-89-6	
Lead	**3270**	mg/kg	1.4	200	06/28/11 17:50	06/30/11 12:55	7439-92-1	
Manganese	**257**	mg/kg	0.68	20	06/28/11 17:50	06/29/11 13:40	7439-96-5	
Nickel	**3.2**	mg/kg	0.68	20	06/28/11 17:50	06/29/11 13:40	7440-02-0	
Zinc	**403**	mg/kg	6.8	20	06/28/11 17:50	06/29/11 13:40	7440-66-6	
7471 Mercury	Analytical Method: EPA 7471 Preparation Method: EPA 7471							
Mercury	**7.7**	mg/kg	0.58	20	06/27/11 11:04	06/27/11 16:03	7439-97-6	
Dry Weight	Analytical Method: % Moisture							
Percent Moisture	**37.8**	%	0.10	1		06/27/11 00:00		

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ANALYTICAL RESULTS

Project: REVISED - Black Pine Mine REV
Pace Project No.: 10160756

Sample: CML-SD-16-00 **Lab ID: 10160756011** Collected: 06/16/11 10:30 Received: 06/17/11 08:50 Matrix: Solid

Results reported on a "dry-weight" basis

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
6020 MET ICPMS	Analytical Method: EPA 6020 Preparation Method: EPA 3050							
Antimony	**2130**	mg/kg	2.9	100	06/28/11 17:50	06/30/11 12:58	7440-36-0	
Arsenic	**1670**	mg/kg	2.9	100	06/28/11 17:50	06/30/11 12:58	7440-38-2	
Barium	**492**	mg/kg	0.35	20	06/28/11 17:50	06/29/11 13:43	7440-39-3	
Cadmium	**26.6**	mg/kg	0.092	20	06/28/11 17:50	06/29/11 13:43	7440-43-9	
Chromium	**2.0**	mg/kg	0.58	20	06/28/11 17:50	06/29/11 13:43	7440-47-3	
Cobalt	**0.66**	mg/kg	0.58	20	06/28/11 17:50	06/29/11 13:43	7440-48-4	
Copper	**5170**	mg/kg	11.5	400	06/28/11 17:50	06/30/11 13:02	7440-50-8	
Iron	**27700**	mg/kg	288	100	06/28/11 17:50	06/30/11 12:58	7439-89-6	
Lead	**7330**	mg/kg	2.3	400	06/28/11 17:50	06/30/11 13:02	7439-92-1	
Manganese	**171**	mg/kg	0.58	20	06/28/11 17:50	06/29/11 13:43	7439-96-5	
Nickel	**0.69**	mg/kg	0.58	20	06/28/11 17:50	06/29/11 13:43	7440-02-0	
Zinc	**313**	mg/kg	5.8	20	06/28/11 17:50	06/29/11 13:43	7440-66-6	
7471 Mercury	Analytical Method: EPA 7471 Preparation Method: EPA 7471							
Mercury	**8.0**	mg/kg	0.56	20	06/27/11 11:04	06/27/11 16:05	7439-97-6	
Dry Weight	Analytical Method: % Moisture							
Percent Moisture	**31.0**	%	0.10	1		06/27/11 00:00		

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QUALITY CONTROL DATA

Project: REVISED - Black Pine Mine REV
Pace Project No.: 10160756

QC Batch: MPRP/26758 Analysis Method: EPA 200.8
QC Batch Method: EPA 200.8 Analysis Description: 200.8 MET
Associated Lab Samples: 10160756001, 10160756002, 10160756003, 10160756004, 10160756005, 10160756006

METHOD BLANK: 999080 Matrix: Water
Associated Lab Samples: 10160756001, 10160756002, 10160756003, 10160756004, 10160756005, 10160756006

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Antimony	ug/L	<0.50	0.50	06/27/11 09:47	
Arsenic	ug/L	<0.50	0.50	06/27/11 09:47	
Barium	ug/L	<0.30	0.30	06/27/11 09:47	
Cadmium	ug/L	<0.080	0.080	06/27/11 09:47	
Chromium	ug/L	<0.50	0.50	06/27/11 09:47	
Copper	ug/L	<0.50	0.50	06/27/11 09:47	
Iron	ug/L	<50.0	50.0	06/27/11 09:47	
Lead	ug/L	<0.10	0.10	06/28/11 06:42	
Manganese	ug/L	<0.50	0.50	06/27/11 09:47	
Nickel	ug/L	<0.50	0.50	06/27/11 09:47	
Silver	ug/L	<0.50	0.50	06/27/11 09:47	
Zinc	ug/L	<5.0	5.0	06/27/11 09:47	

LABORATORY CONTROL SAMPLE: 999081

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Antimony	ug/L	80	77.9	97	85-115	
Arsenic	ug/L	80	74.6	93	85-115	
Barium	ug/L	80	80.6	101	85-115	
Cadmium	ug/L	80	82.5	103	85-115	
Chromium	ug/L	80	83.5	104	85-115	
Copper	ug/L	80	86.7	108	85-115	
Iron	ug/L	1000	1020	102	85-115	
Lead	ug/L	80	81.6	102	85-115	
Manganese	ug/L	80	79.2	99	85-115	
Nickel	ug/L	80	86.2	108	85-115	
Silver	ug/L	80	86.7	108	85-115	
Zinc	ug/L	80	86.2	108	85-115	

MATRIX SPIKE SAMPLE: 999082

Parameter	Units	9296528001 Result	Spike Conc.	MS Result	MS % Rec	% Rec Limits	Qualifiers
Antimony	ug/L	6.4	80	96.6	113	70-130	
Arsenic	ug/L	ND	80	90.0	112	70-130	
Barium	ug/L	62.8	80	149	108	70-130	
Cadmium	ug/L	1.9	80	92.4	113	70-130	
Chromium	ug/L	4.9	80	96.0	114	70-130	
Copper	ug/L	131	80	215	106	70-130	
Iron	ug/L	1990	1000	3730	174	70-130	M0
Lead	ug/L	48.3	80	133	105	70-130	

REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL DATA

Project: REVISED - Black Pine Mine REV
Pace Project No.: 10160756

MATRIX SPIKE SAMPLE: 999082

Parameter	Units	9296528001 Result	Spike Conc.	MS Result	MS % Rec	% Rec Limits	Qualifiers
Manganese	ug/L	155	80	241	107	70-130	
Nickel	ug/L	5.9	80	98.6	116	70-130	
Silver	ug/L	ND	80	48.8	60	70-130	M1
Zinc	ug/L	351	80	431	100	70-130	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 1001302 1001303

Parameter	Units	10160756005 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Antimony	ug/L	3.4	80	80	85.2	84.7	102	102	70-130	.5	20	
Arsenic	ug/L	1.7	80	80	82.1	83.7	101	102	70-130	2	20	
Barium	ug/L	36.6	80	80	119	120	103	104	70-130	.7	20	
Cadmium	ug/L	0.15	80	80	82.7	83.0	103	104	70-130	.3	20	
Chromium	ug/L	0.83	80	80	85.2	85.2	105	105	70-130	0	20	
Copper	ug/L	17.4	80	80	103	104	107	108	70-130	.4	20	
Iron	ug/L	617	1000	1000	1930	1490	131	88	70-130	26	20	D6,M0
Lead	ug/L	3.8	80	80	85.7	86.1	102	103	70-130	.5	20	
Manganese	ug/L	7.1	80	80	90.4	88.3	104	102	70-130	2	20	
Nickel	ug/L	0.88	80	80	86.9	88.2	107	109	70-130	1	20	
Silver	ug/L	<0.50	80	80	86.8	87.9	108	109	70-130	1	20	
Zinc	ug/L	14.2	80	80	97.6	101	104	108	70-130	3	20	

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QUALITY CONTROL DATA

Project: REVISED - Black Pine Mine REV
Pace Project No.: 10160756

QC Batch: MPRP/26730 Analysis Method: EPA 6020
QC Batch Method: EPA 3050 Analysis Description: 6020 MET
Associated Lab Samples: 10160756007, 10160756008, 10160756009, 10160756010, 10160756011

METHOD BLANK: 998309 Matrix: Solid
Associated Lab Samples: 10160756007, 10160756008, 10160756009, 10160756010, 10160756011

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Antimony	mg/kg	<0.47	0.47	06/29/11 13:57	
Arsenic	mg/kg	<0.47	0.47	06/29/11 13:57	
Barium	mg/kg	<0.28	0.28	06/29/11 13:57	
Cadmium	mg/kg	<0.075	0.075	06/29/11 13:57	
Chromium	mg/kg	<0.47	0.47	06/29/11 13:57	
Cobalt	mg/kg	<0.47	0.47	06/29/11 13:57	
Copper	mg/kg	<0.47	0.47	06/29/11 13:57	
Iron	mg/kg	<47.2	47.2	06/29/11 13:57	
Lead	mg/kg	<0.094	0.094	06/29/11 13:57	
Manganese	mg/kg	<0.47	0.47	06/29/11 13:57	
Nickel	mg/kg	<0.47	0.47	06/29/11 13:57	
Zinc	mg/kg	<4.7	4.7	06/29/11 13:57	

LABORATORY CONTROL SAMPLE: 998310

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Antimony	mg/kg	20	21.7	109	75-125	
Arsenic	mg/kg	20	22.2	111	75-125	
Barium	mg/kg	20	21.3	107	75-125	
Cadmium	mg/kg	20	21.2	106	75-125	
Chromium	mg/kg	20	22.0	110	75-125	
Cobalt	mg/kg	20	23.1	116	75-125	
Copper	mg/kg	20	22.8	114	75-125	
Iron	mg/kg	250	288	115	75-125	
Lead	mg/kg	20	21.0	105	75-125	
Manganese	mg/kg	20	22.0	110	75-125	
Nickel	mg/kg	20	21.6	108	75-125	
Zinc	mg/kg	20	22.0	110	75-125	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 998311 998312

Parameter	Units	10160501002 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Antimony	mg/kg	ND	22.4	21.2	18.0	15.6	79	72	75-125	15	20	M6
Arsenic	mg/kg	6.5	22.4	21.2	29.1	27.5	101	99	75-125	6	20	
Barium	mg/kg	28.1	22.4	21.2	63.6	70.5	159	201	75-125	10	20	M6
Cadmium	mg/kg	0.14	22.4	21.2	22.6	21.8	100	102	75-125	4	20	
Chromium	mg/kg	38.7	22.4	21.2	66.1	69.4	122	145	75-125	5	20	M6
Cobalt	mg/kg		22.4	21.2	33.1	32.0	110	111	75-125	3	20	
Copper	mg/kg	31.9	22.4	21.2	65.4	58.1	150	124	75-125	12	20	M6

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QUALITY CONTROL DATA

Project: REVISED - Black Pine Mine REV
Pace Project No.: 10160756

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 998311 998312

Parameter	Units	10160501002 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Iron	mg/kg	44900	280	264	37800	40300	-2540	-1740	75-125	6	20	M6
Lead	mg/kg	4.1	22.4	21.2	26.7	27.9	101	113	75-125	4	20	
Manganese	mg/kg	1600	22.4	21.2	1920	1910	1420	1490	75-125	.2	20	E,M6
Nickel	mg/kg	16.6	22.4	21.2	42.7	41.0	116	116	75-125	4	20	
Zinc	mg/kg	36.4	22.4	21.2	67.6	62.6	139	124	75-125	8	20	M6

MATRIX SPIKE SAMPLE: 998313

Parameter	Units	258133003 Result	Spike Conc.	MS Result	MS % Rec	% Rec Limits	Qualifiers
Antimony	mg/kg	ND	24.3	16.9	68	75-125	M6
Arsenic	mg/kg	2.9	24.3	27.9	102	75-125	
Barium	mg/kg	51.0	24.3	81.6	126	75-125	M6
Cadmium	mg/kg	ND	24.3	22.7	93	75-125	
Chromium	mg/kg	26.6	24.3	51.7	103	75-125	
Cobalt	mg/kg		24.3	31.0	96	75-125	
Copper	mg/kg	17.4	24.3	44.9	113	75-125	
Iron	mg/kg	19000	305	20600	523	75-125	M6
Lead	mg/kg	8.5	24.3	34.1	105	75-125	
Manganese	mg/kg	272	24.3	313	170	75-125	M6
Nickel	mg/kg	29.4	24.3	52.2	94	75-125	
Zinc	mg/kg	39.4	24.3	68.6	120	75-125	

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QUALITY CONTROL DATA

Project: REVISED - Black Pine Mine REV
Pace Project No.: 10160756

QC Batch: MERP/5556 Analysis Method: EPA 7471
QC Batch Method: EPA 7471 Analysis Description: 7471 Mercury
Associated Lab Samples: 10160756007, 10160756008, 10160756009, 10160756010, 10160756011

METHOD BLANK: 1000718 Matrix: Solid
Associated Lab Samples: 10160756007, 10160756008, 10160756009, 10160756010, 10160756011

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Mercury	mg/kg	<0.019	0.019	06/27/11 15:11	

LABORATORY CONTROL SAMPLE: 1000719

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Mercury	mg/kg	.44	0.48	108	80-120	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 1000720 1000721

Parameter	Units	10160647003 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Mercury	mg/kg	<0.023	.57	.5	0.59	0.51	103	103	80-120	15	20	

MATRIX SPIKE SAMPLE: 1000722

Parameter	Units	10161056004 Result	Spike Conc.	MS Result	MS % Rec	% Rec Limits	Qualifiers
Mercury	mg/kg	0.71	.46	0.92	46	80-120	M1

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602 S 25th Street
Billings, MT 591014549
(406)254-7226

QUALITY CONTROL DATA

Project: REVISED - Black Pine Mine REV
Pace Project No.: 10160756

QC Batch: MPRP/26864 Analysis Method: % Moisture
QC Batch Method: % Moisture Analysis Description: Dry Weight/Percent Moisture
Associated Lab Samples: 10160756007, 10160756008, 10160756009, 10160756010, 10160756011

SAMPLE DUPLICATE: 1003029

Parameter	Units	10160673011 Result	Dup Result	RPD	Max RPD	Qualifiers
Percent Moisture	%	21.0	21.1	.5	30	

SAMPLE DUPLICATE: 1003030

Parameter	Units	10160756011 Result	Dup Result	RPD	Max RPD	Qualifiers
Percent Moisture	%	31.0	34.4	10	30	

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QUALITY CONTROL DATA

Project: REVISED - Black Pine Mine REV
Pace Project No.: 10160756

QC Batch: MT/6229 Analysis Method: SM 2310
QC Batch Method: SM 2310 Analysis Description: 2310 Acidity
Associated Lab Samples: 10160756001, 10160756002, 10160756003, 10160756005, 10160756006

METHOD BLANK: 1001046 Matrix: Water
Associated Lab Samples: 10160756001, 10160756002, 10160756003, 10160756005, 10160756006

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Acidity	mg/L	<5.0	5.0	06/24/11 16:55	

SAMPLE DUPLICATE: 1001047

Parameter	Units	10160709001 Result	Dup Result	RPD	Max RPD	Qualifiers
Acidity	mg/L	<5.0	<5.0		20	

SAMPLE DUPLICATE: 1001048

Parameter	Units	10160994002 Result	Dup Result	RPD	Max RPD	Qualifiers
Acidity	mg/L	<5.0	<5.0		20	

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QUALITY CONTROL DATA

Project: REVISED - Black Pine Mine REV
Pace Project No.: 10160756

QC Batch: MT/6193 Analysis Method: SM 2540D
QC Batch Method: SM 2540D Analysis Description: 2540D Total Suspended Solids
Associated Lab Samples: 10160756001, 10160756002, 10160756003, 10160756005, 10160756006

METHOD BLANK: 998567 Matrix: Water
Associated Lab Samples: 10160756001, 10160756002, 10160756003, 10160756005, 10160756006

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Total Suspended Solids	mg/L	<1.0	1.0	06/21/11 16:47	

LABORATORY CONTROL SAMPLE: 998566

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Total Suspended Solids	mg/L	25	27.0	108	71-129	

SAMPLE DUPLICATE: 998935

Parameter	Units	10160709001 Result	Dup Result	RPD	Max RPD	Qualifiers
Total Suspended Solids	mg/L	2.4	4.6	63	20	R3

SAMPLE DUPLICATE: 998936

Parameter	Units	10160709003 Result	Dup Result	RPD	Max RPD	Qualifiers
Total Suspended Solids	mg/L	65.6	70.0	6	20	

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QUALITY CONTROL DATA

Project: REVISED - Black Pine Mine REV
Pace Project No.: 10160756

QC Batch: MT/6256 Analysis Method: EPA 300.0
QC Batch Method: EPA 300.0 Analysis Description: 300.0 IC Anions
Associated Lab Samples: 10160756001, 10160756002, 10160756003, 10160756005

METHOD BLANK: 1003183 Matrix: Water
Associated Lab Samples: 10160756001, 10160756002, 10160756003, 10160756005

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Sulfate	mg/L	<1.0	1.0	06/28/11 05:10	

LABORATORY CONTROL SAMPLE: 1003184

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Sulfate	mg/L	20	20.6	103	90-110	

MATRIX SPIKE SAMPLE: 1003185

Parameter	Units	10160484002 Result	Spike Conc.	MS Result	MS % Rec	% Rec Limits	Qualifiers
Sulfate	mg/L	11.3	20	32.5	106	80-120	

MATRIX SPIKE SAMPLE: 1003187

Parameter	Units	10160484013 Result	Spike Conc.	MS Result	MS % Rec	% Rec Limits	Qualifiers
Sulfate	mg/L	33.0	40	78.2	113	80-120	

SAMPLE DUPLICATE: 1003186

Parameter	Units	10160484004 Result	Dup Result	RPD	Max RPD	Qualifiers
Sulfate	mg/L	9.0	9.0	.6	20	

SAMPLE DUPLICATE: 1003188

Parameter	Units	10160484015 Result	Dup Result	RPD	Max RPD	Qualifiers
Sulfate	mg/L	14.5	14.5	.08	20	

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QUALITY CONTROL DATA

Project: REVISED - Black Pine Mine REV
Pace Project No.: 10160756

QC Batch: MT/6264
QC Batch Method: EPA 300.0
Analysis Method: EPA 300.0
Analysis Description: 300.0 IC Anions
Associated Lab Samples: 10160756006

METHOD BLANK: 1003621 Matrix: Water
Associated Lab Samples: 10160756006

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Sulfate	mg/L	<1.0	1.0	06/29/11 00:15	

LABORATORY CONTROL SAMPLE: 1003622

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Sulfate	mg/L	20	21.9	109	90-110	

MATRIX SPIKE SAMPLE: 1003623

Parameter	Units	10160756006 Result	Spike Conc.	MS Result	MS % Rec	% Rec Limits	Qualifiers
Sulfate	mg/L	3.5	20	22.7	96	80-120	

MATRIX SPIKE SAMPLE: 1003625

Parameter	Units	10161006001 Result	Spike Conc.	MS Result	MS % Rec	% Rec Limits	Qualifiers
Sulfate	mg/L	845	1000	1880	103	80-120	

SAMPLE DUPLICATE: 1003626

Parameter	Units	10161006001 Result	Dup Result	RPD	Max RPD	Qualifiers
Sulfate	mg/L	845	837	1	20	

SAMPLE DUPLICATE: 1005216

Parameter	Units	10160956001 Result	Dup Result	RPD	Max RPD	Qualifiers
Sulfate	mg/L	134	137	2	20	

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QUALITY CONTROL DATA

Project: REVISED - Black Pine Mine REV
Pace Project No.: 10160756

QC Batch: WET/22702 Analysis Method: SM 2320B
QC Batch Method: SM 2320B Analysis Description: 2320B Alkalinity
Associated Lab Samples: 10160756001, 10160756002, 10160756003, 10160756005, 10160756006

METHOD BLANK: 1000790 Matrix: Water
Associated Lab Samples: 10160756001, 10160756002, 10160756003, 10160756005, 10160756006

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Alkalinity, Total as CaCO3	mg/L	<5.0	5.0	06/23/11 13:05	

LABORATORY CONTROL SAMPLE & LCSD: 1000791 1000792

Parameter	Units	Spike Conc.	LCS Result	LCSD Result	LCS % Rec	LCSD % Rec	% Rec Limits	RPD	Max RPD	Qualifiers
Alkalinity, Total as CaCO3	mg/L	40	38.8	39.3	97	98	90-110	2	30	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 1000793 1000794

Parameter	Units	10160702001 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Alkalinity, Total as CaCO3	mg/L	220	40	40	263	265	106	111	80-120	.8	30	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 1000795 1000796

Parameter	Units	10161012002 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Alkalinity, Total as CaCO3	mg/L	270	40	40	323	317	133	117	80-120	2	30	M1

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QUALITY CONTROL DATA

Project: REVISED - Black Pine Mine REV
Pace Project No.: 10160756

QC Batch: WET/22692 Analysis Method: SM 2540C
QC Batch Method: SM 2540C Analysis Description: 2540C Total Dissolved Solids
Associated Lab Samples: 10160756001, 10160756002, 10160756003, 10160756005, 10160756006

METHOD BLANK: 999964 Matrix: Water
Associated Lab Samples: 10160756001, 10160756002, 10160756003, 10160756005, 10160756006

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Total Dissolved Solids	mg/L	<10.0	10.0	06/22/11 11:26	

LABORATORY CONTROL SAMPLE: 999965

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Total Dissolved Solids	mg/L	1000	998	100	80-120	

SAMPLE DUPLICATE: 999966

Parameter	Units	10160655005 Result	Dup Result	RPD	Max RPD	Qualifiers
Total Dissolved Solids	mg/L	34.0	29.0	16	20	

SAMPLE DUPLICATE: 999967

Parameter	Units	10160655006 Result	Dup Result	RPD	Max RPD	Qualifiers
Total Dissolved Solids	mg/L	34.0	32.0	6	20	

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QUALIFIERS

Project: REVISED - Black Pine Mine REV
Pace Project No.: 10160756

DEFINITIONS

DF - Dilution Factor, if reported, represents the factor applied to the reported data due to changes in sample preparation, dilution of the sample aliquot, or moisture content.

ND - Not Detected at or above adjusted reporting limit.

J - Estimated concentration above the adjusted method detection limit and below the adjusted reporting limit.

MDL - Adjusted Method Detection Limit.

S - Surrogate

1,2-Diphenylhydrazine (8270 listed analyte) decomposes to Azobenzene.

Consistent with EPA guidelines, unrounded data are displayed and have been used to calculate % recovery and RPD values.

LCS(D) - Laboratory Control Sample (Duplicate)

MS(D) - Matrix Spike (Duplicate)

DUP - Sample Duplicate

RPD - Relative Percent Difference

NC - Not Calculable.

SG - Silica Gel - Clean-Up

U - Indicates the compound was analyzed for, but not detected.

N-Nitrosodiphenylamine decomposes and cannot be separated from Diphenylamine using Method 8270. The result reported for each analyte is a combined concentration.

LABORATORIES

PASI-M	Pace Analytical Services - Minneapolis
PASI-MT	Pace Analytical Services - Montana

ANALYTE QUALIFIERS

D6	The relative percent difference (RPD) between the sample and sample duplicate exceeded laboratory control limits.
E	Analyte concentration exceeded the calibration range. The reported result is estimated.
M0	Matrix spike recovery and/or matrix spike duplicate recovery was outside laboratory control limits.
M1	Matrix spike recovery exceeded QC limits. Batch accepted based on laboratory control sample (LCS) recovery.
M6	Matrix spike and Matrix spike duplicate recovery not evaluated against control limits due to sample dilution.
R3	RPD value was outside control limits due to uncertainty of values at or near the PRL.

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QUALITY CONTROL DATA CROSS REFERENCE TABLE

Project: REVISED - Black Pine Mine REV
Pace Project No.: 10160756

Lab ID	Sample ID	QC Batch Method	QC Batch	Analytical Method	Analytical Batch
10160756001	**CML-SW-14**	EPA 200.8	MPRP/26758	EPA 200.8	ICPM/10909
10160756002	**CML-SW-19**	EPA 200.8	MPRP/26758	EPA 200.8	ICPM/10909
10160756003	**CML-SW-02**	EPA 200.8	MPRP/26758	EPA 200.8	ICPM/10909
10160756004	**CML-Q1-T2**	EPA 200.8	MPRP/26758	EPA 200.8	ICPM/10909
10160756005	**CML-SW-01**	EPA 200.8	MPRP/26758	EPA 200.8	ICPM/10909
10160756006	**CML-SW-09**	EPA 200.8	MPRP/26758	EPA 200.8	ICPM/10909
10160756007	**CML-SD-15-00**	EPA 3050	MPRP/26730	EPA 6020	ICPM/10932
10160756008	**CML-SD-13-00**	EPA 3050	MPRP/26730	EPA 6020	ICPM/10932
10160756009	**CML-SD-17-00**	EPA 3050	MPRP/26730	EPA 6020	ICPM/10932
10160756010	**CML-SD-14-00**	EPA 3050	MPRP/26730	EPA 6020	ICPM/10932
10160756011	**CML-SD-16-00**	EPA 3050	MPRP/26730	EPA 6020	ICPM/10932
10160756007	**CML-SD-15-00**	EPA 7471	MERP/5556	EPA 7471	MERC/6376
10160756008	**CML-SD-13-00**	EPA 7471	MERP/5556	EPA 7471	MERC/6376
10160756009	**CML-SD-17-00**	EPA 7471	MERP/5556	EPA 7471	MERC/6376
10160756010	**CML-SD-14-00**	EPA 7471	MERP/5556	EPA 7471	MERC/6376
10160756011	**CML-SD-16-00**	EPA 7471	MERP/5556	EPA 7471	MERC/6376
10160756007	**CML-SD-15-00**	% Moisture	MPRP/26864		
10160756008	**CML-SD-13-00**	% Moisture	MPRP/26864		
10160756009	**CML-SD-17-00**	% Moisture	MPRP/26864		
10160756010	**CML-SD-14-00**	% Moisture	MPRP/26864		
10160756011	**CML-SD-16-00**	% Moisture	MPRP/26864		
10160756001	**CML-SW-14**	SM 2310	MT/6229		
10160756002	**CML-SW-19**	SM 2310	MT/6229		
10160756003	**CML-SW-02**	SM 2310	MT/6229		
10160756005	**CML-SW-01**	SM 2310	MT/6229		
10160756006	**CML-SW-09**	SM 2310	MT/6229		
10160756001	**CML-SW-14**	SM 2540D	MT/6193		
10160756002	**CML-SW-19**	SM 2540D	MT/6193		
10160756003	**CML-SW-02**	SM 2540D	MT/6193		
10160756005	**CML-SW-01**	SM 2540D	MT/6193		
10160756006	**CML-SW-09**	SM 2540D	MT/6193		
10160756001	**CML-SW-14**	EPA 300.0	MT/6256		
10160756002	**CML-SW-19**	EPA 300.0	MT/6256		
10160756003	**CML-SW-02**	EPA 300.0	MT/6256		
10160756005	**CML-SW-01**	EPA 300.0	MT/6256		
10160756006	**CML-SW-09**	EPA 300.0	MT/6264		
10160756001	**CML-SW-14**	SM 2320B	WET/22702		
10160756002	**CML-SW-19**	SM 2320B	WET/22702		
10160756003	**CML-SW-02**	SM 2320B	WET/22702		
10160756005	**CML-SW-01**	SM 2320B	WET/22702		
10160756006	**CML-SW-09**	SM 2320B	WET/22702		
10160756001	**CML-SW-14**	SM 2540C	WET/22692		
10160756002	**CML-SW-19**	SM 2540C	WET/22692		
10160756003	**CML-SW-02**	SM 2540C	WET/22692		

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QUALITY CONTROL DATA CROSS REFERENCE TABLE

Project: REVISED - Black Pine Mine REV
Pace Project No.: 10160756

Lab ID	Sample ID	QC Batch Method	QC Batch	Analytical Method	Analytical Batch
10160756005	**CML-SW-01**	SM 2540C	WET/22692		
10160756006	**CML-SW-09**	SM 2540C	WET/22692		

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CHAIN-OF-CUSTODY / Analytical Request Document

The Chain-of-Custody is a LEGAL DOCUMENT. All relevant fields must be completed accurately.

Page: 1 of 1

1321623

Section A Required Client Information:	Section B Required Project Information:	Section C Invoice Information:
Company: Herrera	Report To: Kevin Hoult	Attention:
Address:	Copy To:	Company Name: DEQ
		Address:
Email To:	Purchase Order No.:	Pace Quote Reference:
Phone: Fax:	Project Name: Black Pine Mine	Pace Project Manager:
Requested Due Date/TAT:	Project Number:	Pace Profile #:

REGULATORY AGENCY

☐ NPDES ☐ GROUND WATER ☐ DRINKING WATER

☐ UST ☐ RCRA ☐ OTHER _____

Site Location STATE: _____

Section D Required Client Information

SAMPLE ID
(A-Z, 0-9 / ,-)
Sample IDs MUST BE UNIQUE

Matrix Codes (MATRIX / CODE): Drinking Water DW; Water WT; Waste Water WW; Product P; Soil/Solid SL; Oil OL; Wipe WP; Air AR; Tissue TS; Other OT

Requested Analysis Filtered (Y/N)

ITEM #	SAMPLE ID	MATRIX CODE (see valid codes to left)	SAMPLE TYPE (G=GRAB C=COMP)	COLLECTED: COMPOSITE START DATE	COMPOSITE START TIME	COMPOSITE END/GRAB DATE	COMPOSITE END/GRAB TIME	SAMPLE TEMP AT COLLECTION	# OF CONTAINERS	Preservatives: Unpreserved	H_2SO_4	HNO_3	HCl	NaOH	$Na_2S_2O_3$	Methanol	Other	Analysis Test Y/N	TSS	Alk, sulfate	Acidity, sulfate	Total Metals (Solid)									Residual Chlorine (Y/N)	Pace Project No./ Lab I.D.
																			N	N	N	Y	N								
1	CML-SW-14	W	G			6/15/11	~~13:15~~		4	X		X							X	X	X	X								001
2	CML-SW-19						1259		4	X		X							X	X	X	X								002
3	CML-SW-02						1403		4	X		X							X	X	X	X								003
4	CML-Q1-T2						1403		1			X										X								004
5	CML-SW-01						1549		4	X		X							X	X	X	X								005
6	CML-SW-09					↓	1513		4	X		X							X	X	X	X								006
7	CML-SD-15-00	S	G			6/14/11	0955		1	X													X							007
8	CML-SD-13-00						0920		1	X													X							008
9	CML-SD-17-00						1040		1	X													X							009
10	CML-SD-14-00						0930		1	X													X							010
11	CML-SD-16-00	↓	↓				1030		1	X													X							011
12																														

Residual Chlorine (Y/N): Y/N 6-7-11

ADDITIONAL COMMENTS	RELINQUISHED BY / AFFILIATION	DATE	TIME	ACCEPTED BY / AFFILIATION	DATE	TIME	SAMPLE CONDITIONS
All "SML" on bottles should be "CML"	[signature] / Herrera	6/16/11	1130	[signature] PACE	6/17/11		
							4.6° / Y / Y / Y

Temp in °C | Received on Ice (Y/N) | Custody Sealed Cooler (Y/N) | Samples Intact (Y/N)

ORIGINAL

SAMPLER NAME AND SIGNATURE

PRINT Name of SAMPLER: Gina Catarra

SIGNATURE of SAMPLER: [signature] DATE Signed (MM/DD/YY): 6/16/11

*Important Note: By signing this form you are accepting Pace's NET 30 day payment terms and agreeing to late charges of 1.5% per month for any invoices not paid within 30 days.

F-ALL-Q-020rev.07, 15-May-2007

Sample Condition Upon Receipt

Pace Analytical

Client Name: DEQ

Project # 10160756

(67)

Courier: ☒ Fed Ex ☐ UPS ☐ USPS ☐ Client ☐ Commercial ☐ Pace Other _____

Tracking #: 879718460013561

Custody Seal on Cooler/Box Present: ☒ yes ☐ no Seals intact: ☒ yes ☐ no

Packing Material: ☒ Bubble Wrap ☐ Bubble Bags ☐ None ☒ Other absorbent pad Temp Blank: Yes ☒ No ____

Thermometer Used 1383045 or 135 Type of Ice: (Wet) Blue None ☒ Samples on ice, cooling process has begun

Cooler Temperature 4.6 Biological Tissue is Frozen: Yes No

Temp should be above freezing to 6°C

Comments:

Date and Initials of person examining contents: RW 6/17/11

Chain of Custody Present:	☒Yes ☐No ☐N/A	1.
Chain of Custody Filled Out:	☒Yes ☐No ☐N/A	2.
Chain of Custody Relinquished:	☒Yes ☐No ☐N/A	3.
Sampler Name & Signature on COC:	☒Yes ☐No ☐N/A	4.
Samples Arrived within Hold Time:	☒Yes ☐No ☐N/A	5.
Short Hold Time Analysis (<72hr):	RW 6/17/11 ☒Yes ☐No ☐N/A	6.
Rush Turn Around Time Requested:	☐Yes ☒No ☐N/A	7.
Sufficient Volume:	☒Yes ☐No ☐N/A	8.
Correct Containers Used:	☒Yes ☐No ☐N/A	9.
-Pace Containers Used:	☒Yes ☐No ☐N/A	
Containers Intact:	☒Yes ☐No ☐N/A	10.
Filtered volume received for Dissolved tests	☐Yes ☐No ☒N/A	11.
Sample Labels match COC:	☐Yes ☒No ☐N/A	12: Per client !!! All "SML" on bottles should be "CML" !!!
-Includes date/time/ID/Analysis Matrix: Aq, SL		
All containers needing acid/base preservation have been checked. Noncompliance are noted in 13.	☒Yes ☐No ☐N/A	13. ☒ HNO3 ☐ H2SO4 ☐ NaOH ☐ HCl
All containers needing preservation are found to be in compliance with EPA recommendation.	☒Yes ☐No ☐N/A	Samp # 1-6 (1/1)
Exceptions: VOA,Coliform, TOC, Oil and Grease, WI-DRO (water)	RW to 2 ☒Yes ☒No	Initial when completed RW / Lot # of added preservative
Samples checked for dechlorination:	☐Yes ☐No ☒N/A	14.
Headspace in VOA Vials (>6mm):	☐Yes ☐No ☒N/A	15.
Trip Blank Present:	☐Yes ☐No ☒N/A	16.
Trip Blank Custody Seals Present	☐Yes ☐No ☒N/A	
Pace Trip Blank Lot # (if purchased):		

Client Notification/ Resolution: Field Data Required? Y / N

Person Contacted: _____ Date/Time: _____

Comments/ Resolution: _____

Project Manager Review: _____ **Date:** 6/17/11

Note: Whenever there is a discrepancy affecting North Carolina compliance samples, a copy of this form will be sent to the North Carolina DEHNR Certification Office (i.e out of hold, incorrect preservative, out of temp, incorrect containers)

Pace Analytical Services, Inc.
602 S 25th Street
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(406)254-7226

June 30, 2011

Kevin Houck
Herrera Environmental Consultants
101 East Broadway, Suite 610
Missoula, MT 59802

RE: Project: Black Pine Mine
Pace Project No.: 10160851

Dear Kevin Houck:
Enclosed are the analytical results for sample(s) received by the laboratory on June 17, 2011. The results relate only to the samples included in this report.

The mercury analysis was performed by the Pace Analytical Services Virginia, MN laboratory. The report of their analysis is attached.

If you have any questions concerning this report, please feel free to contact me.

Sincerely,

Denise Jensen

denise.jensen@pacelabs.com
Project Manager

Enclosures

cc: Devin Clary, Montana Dept. of Environmental Quality
Mark Donner, Trihydro

REPORT OF LABORATORY ANALYSIS

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SAMPLE SUMMARY

Project: Black Pine Mine
Pace Project No.: 10160851

Lab ID	Sample ID	Matrix	Date Collected	Date Received
10160851001	**CML-SW-17**	Water	06/14/11 18:10	06/17/11 08:50
10160851002	**TSP-6**	Water	06/14/11 13:50	06/17/11 08:50
10160851003	**TSP-8**	Water	06/13/11 16:45	06/17/11 08:50
10160851004	**CML- SW- 07**	Water	06/14/11 10:05	06/17/11 08:50
10160851005	**TSP-3**	Water	06/13/11 15:30	06/17/11 08:50
10160851006	**TSP-9**	Water	06/13/11 17:30	06/17/11 08:50
10160851007	**FIELD BLANK 1**	Water	06/13/11 17:45	06/17/11 08:50
10160851008	**MCSP- 1**	Water	06/13/11 14:40	06/17/11 08:50
10160851009	**CML-SW-06**	Water	06/13/11 16:30	06/17/11 08:50

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Pace Analytical Services, Inc.
602 S 25th Street
Billings, MT 591014549
(406)254-7226

PROJECT NARRATIVE

Project:
Pace Project No.:

Method:
Description:
Client:
Date:

This data package has been reviewed for quality and completeness and is approved for release.

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Thursday, June 30, 2011

Pace Analytical®
Laboratory Results

Pace Analytical Billings
Attn: Denise Jensen
602 S 25th Street
Billings, MT 591014549

RE: WO# 10160851- Black Pine Mine; Pace COC#116257

Dear Ms. Jensen,

Enclosed are the analytical results for the samples received by the laboratory on June 21, 2011.

If you have any questions concerning this report, please feel free to contact me at 218-742-1007.

Sincerely,

Jennifer Tarnowski
Project Manager

ACCREDITED IN ACCORDANCE WITH ilac

SAMPLE SUMMARY

Pace Analytical Services
315 Chestnut Street
PO Box 1212
Virginia, MN 55792
Phone: 218-742-1042
Fax: 218-742-1010

Laboratory Results

Virginia MDH Certification: 027-137-445
Duluth MDH Certification: 027-137-446

PACE COC: 116257

Client: - Pace Analytical Billings
Project: VM13294 - Black Pine Mine
Sampled By: Client
Report Date: 6/30/2011

Sample Description	Sample ID	Sample Type	Matrix	Sample Date	Received Date
CML-SW-17 (10160851001)	492249	Grab	Aqueous	6/14/2011 18:10	6/21/2011 15:30
TSP-6 (10160851002)	492250	Grab	Aqueous	6/14/2011 13:50	6/21/2011 15:30
TSP-8 (10160851003)	492251	Grab	Aqueous	6/13/2011 16:45	6/21/2011 15:30
CML-SW-07 (10160851004)	492252	Grab	Aqueous	6/14/2011 10:05	6/21/2011 15:30
TSP-3 (10160851005)	492253	Grab	Aqueous	6/13/2011 15:30	6/21/2011 15:30
TSP-9 (10160851006)	492254	Grab	Aqueous	6/13/2011 17:30	6/21/2011 15:30
FIELD BLANK 1 (10160851007)	492255	Grab	Aqueous	6/13/2011 17:45	6/21/2011 15:30
MCSP-1 (10160851008)	492258	Grab	Aqueous	6/13/2011 14:40	6/21/2011 15:30
CML-SW-06 (10160851009)	492257	Grab	Aqueous	6/13/2011 16:30	6/21/2011 15:30

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Results apply only to the sample received. Results for solid matrices are based on dry weight, unless noted.
Analysis was performed in accordance with methods approved by the US EPA and the Minnesota Department of Health, where applicable, unless noted in the report.

SAMPLE RESULTS

PACE Sample: 492249
Description: CML-SW-17 (10160851001)
Sample Date: 6/14/2011 6:10:00 PM

Matrix: Aqueous
Sample Type: Grab

PACE COC: 116257
Client: - Pace Analytical Billings
Project: VM13294 - Black Pine Mine
Sampled By: Client
Report Date: 6/30/2011
Rec'd Temperature: 16.4 °C

Analyte	Result	RL	Units	Method	Prepared Date	Analysis Date	Batch ID
Mercury, Low Level	5.6	0.5	ng/L	EPA 1631E	6/27/2011	6/28/2011	L-062811-2-A

SAMPLE RESULTS

PACE Sample: 492250
Description: TSP-6 (10160851002)
Sample Date: 6/14/2011 1:50:00 PM

Matrix: Aqueous
Sample Type: Grab

PACE COC: 116257
Client: - Pace Analytical Billings
Project: VM13294 - Black Pine Mine
Sampled By: Client
Report Date: 6/30/2011
Rec'd Temperature: 18.4 °C

Analyte	Result	RL	Units	Method	Prepared Date	Analysis Date	Batch ID
Mercury, Low Level	13.2	1	ng/L	EPA 1631E	6/27/2011	6/28/2011	L-062811-2-A

SAMPLE RESULTS

PACE Sample: 492251
Description: TSP-8 (10160851003)
Sample Date: 6/13/2011 4:45:00 PM

Matrix: Aqueous
Sample Type: Grab

PACE COC: 116257
Client: - Pace Analytical Billings
Project: VM13294 - Black Pine Mine
Sampled By: Client
Report Date: 6/30/2011
Rec'd Temperature: 18.4 °C

Analyte	Result	RL	Units	Method	Prepared Date	Analysis Date	Batch ID
Mercury, Low Level	20.8	1	ng/L	EPA 1631E	6/27/2011	6/28/2011	L-062811-2-A

SAMPLE RESULTS

PACE Sample: 492252
Description: CML-SW-07 (10160851004)
Sample Date: 6/14/2011 10:05:00 AM

Matrix: Aqueous
Sample Type: Grab

PACE COC: 116257
Client: - Pace Analytical Billings
Project: VM13294 - Black Pine Mine
Sampled By: Client
Report Date: 6/30/2011
Rec'd Temperature: 18.4 °C

Analyte	Result	RL	Units	Method	Prepared Date	Analysis Date	Batch ID
Mercury, Low Level	2520	100	ng/L	EPA 1631E	6/27/2011	6/28/2011	L-062811-2-A

SAMPLE RESULTS

PACE Sample: 492253
Description: TSP-3 (10160851005)
Sample Date: 6/13/2011 3:30:00 PM

Matrix: Aqueous
Sample Type: Grab

PACE COC: 116257
Client: - Pace Analytical Billings
Project: VM13294 - Black Pine Mine
Sampled By: Client
Report Date: 6/30/2011
Rec'd Temperature: 18.4 °C

Analyte	Result	RL	Units	Method	Prepared Date	Analysis Date	Batch ID
Mercury, Low Level	12.8	1	ng/L	EPA 1631E	6/27/2011	6/28/2011	L-062811-2-A

SAMPLE RESULTS

PACE Sample: 492254
Description: TSP-9 (10160851006)
Sample Date: 6/13/2011 5:30:00 PM

Matrix: Aqueous
Sample Type: Grab

PACE COC: 116257
Client: - Pace Analytical Billings
Project: VM13294 - Black Pine Mine
Sampled By: Client
Report Date: 6/30/2011
Rec'd Temperature: 18.4 °C

Analyte	Result	RL	Units	Method	Prepared Date	Analysis Date	Batch ID
Mercury, Low Level	19.9	5	ng/L	EPA 1631E	6/27/2011	6/28/2011	L-062811-2-A

SAMPLE RESULTS

PACE Sample: 492255
Description: FIELD BLANK 1 (10160851007)
Sample Date: 6/13/2011 5:45:00 PM

Matrix: Aqueous
Sample Type: Grab

PACE COC: 116257
Client: - Pace Analytical Billings
Project: VM13294 - Black Pine Mine
Sampled By: Client
Report Date: 6/30/2011
Rec'd Temperature: 18.4 °C

Analyte	Result	RL	Units	Method	Prepared Date	Analysis Date	Batch ID
Mercury, Low Level	<0.5	0.5	ng/L	EPA 1631E	6/27/2011	6/28/2011	L-062811-2-A

SAMPLE RESULTS

PACE Sample: 492256
Description: MCSP-1 (10160851008)
Sample Date: 6/13/2011 2:40:00 PM

Matrix: Aqueous
Sample Type: Grab

PACE COC: 116257
Client: - Pace Analytical Billings
Project: VM13294 - Black Pine Mine
Sampled By: Client
Report Date: 6/30/2011
Rec'd Temperature: 18.4 °C

Analyte	Result	RL	Units	Method	Prepared Date	Analysis Date	Batch ID
Mercury, Low Level	45.0	10	ng/L	EPA 1631E	6/27/2011	6/28/2011	L-062811-2-A

SAMPLE RESULTS

PACE Sample: 492257
Description: CML-SW-06 (10160851009)
Sample Date: 6/13/2011 4:30:00 PM

Matrix: Aqueous
Sample Type: Grab

PACE COC: 116257
Client: - Pace Analytical Billings
Project: VM13294 - Black Pine Mine
Sampled By: Client
Report Date: 6/30/2011
Rec'd Temperature: 18.4 °C

Analyte	Result	RL	Units	Method	Prepared Date	Analysis Date	Batch ID
Mercury, Low Level	1910	100	ng/L	EPA 1631E	6/27/2011	6/28/2011	L-062811-2-A

QC REPORT for 116257

Mercury, Low Level

QC Batch ID: L-062811-2-A

Description	Result	RL	Method	Spike Level	Source Result	Spike %R	%R Limits	RPD	RPD Limit
492347 MS	5.88 ng/L	0.5	EPA 1631E	5	ND	109	71-125	NA	NA
492347 MSD	5.75 ng/L	0.5	EPA 1631E	5	ND	107	71-125	2.2	24
492605 MS	6.84 ng/L	0.5	EPA 1631E	5	ND	107	71-125	NA	NA
492605 MSD	6.90 ng/L	0.5	EPA 1631E	5	ND	108	71-125	0.8	24
493615 MB	<0.5 ng/L	0.5	EPA 1631E	NA	NA	NA	NA	NA	NA
493615 MB	<0.5 ng/L	0.5	EPA 1631E	NA	NA	NA	NA	NA	NA
493616 LCS	4.71 ng/L	0.5	EPA 1631E	5	NA	94.2	77-123	NA	NA
493621 MB	<0.5 ng/L	0.5	EPA 1631E	NA	NA	NA	NA	NA	NA
493622 LCS	5.30 ng/L	0.5	EPA 1631E	5	NA	106	77-123	NA	NA
493627 MB	<0.5 ng/L	0.5	EPA 1631E	NA	NA	NA	NA	NA	NA
493628 LCS	5.40 ng/L	0.5	EPA 1631E	5	NA	108	77-123	NA	NA

Note:
LCS: Laboratory Control Sample; LCSD: Laboratory Control Sample Duplicate; Dup: Sample Duplicate; MB: Method Blank; MS: Matrix Spike; MSD: Matrix Spike Duplicate; RL: Reporting Limit; RPD: Relative Percent Difference.
The source result represents the sample result.

Pace Analytical	Document Name: Sample Condition Upon Receipt Form	Document Revision: 20June2011 Page 1 of 1
	Document No: F-VM-C-001Rev.01	Issuing Authority: Pace Virginia Minnesota Quality Office

Client Name: Pace Project # 116257

Courier: ☒ Fed Ex ☐ UPS ☐ USPS ☐ Client ☐ Commercial ☐ Pace Other _____

Tracking #: 5022 0763 0672

Custody Seal on Cooler/Box Present: ☒ yes ☐ no Seals intact: ☒ yes ☐ no N/A

Packing Material: ☐ Bubble Wrap ☒ Bubble Bags ☐ None ☐ Other _____ Temp Blank: Yes ____ No X

Thermometer Used 101594812 Type of Ice: Wet Blue (None) ☐ Samples on ice, cooling process has begun

Cooler Temperature 18.4 Biological Tissue is Frozen: Yes No (N/A)

Temp should be above freezing to 6°C

Date and Initials of person examining contents: AM 6/21/11

		Comments:
Chain of Custody Present:	☒Yes ☐No ☐N/A	1.
Chain of Custody Filled Out:	☒Yes ☐No ☐N/A	2.
Chain of Custody Relinquished:	☒Yes ☐No ☐N/A	3.
Sampler Name & Signature on COC:	☐Yes ☒No ☐N/A	4.
Samples Arrived within Hold Time:	☒Yes ☐No ☐N/A	5.
Short Hold Time Analysis (<72hr):	☐Yes ☐No ☒N/A	6.
Rush Turn Around Time Requested:	☒Yes ☐No ☐N/A	7. 6/30/11
Sufficient Volume:	☒Yes ☐No ☐N/A	8.
Correct Containers Used:	☒Yes ☐No ☐N/A	9.
-Pace Containers Used:	☒Yes ☐No ☐N/A	
Containers Intact:	☒Yes ☐No ☐N/A	10.
Filtered volume received for Dissolved tests	☐Yes ☐No ☒N/A	11.
Sample Labels match COC:	☒Yes ☐No ☐N/A	12.
-Includes date/time/ID/Analysis Matrix:		
All containers needing acid/base preservation will be checked and documented in the pH logbook		13. See pH log for results and additional preservation documentation
Headspace in VOA Vials (>6mm):	☐Yes ☐No ☒N/A	14.
Trip Blank Present:	☐Yes ☐No ☒N/A	15.
Trip Blank Custody Seals Present	☐Yes ☐No ☒N/A	
Pace Trip Blank Lot # :		

Client Notification/ Resolution: Field Data Required? Y / N

Person Contacted: Denise Jensen Date/Time: 6/22/11 0935

Comments/ Resolution:

* contacted Denise by email to verify no certification is needed. We will analyze samples.
Heather Eyler 6/22/11

Project Manager Review: [signature] Date: 6/22/11

116257

Chain of Custody

Pace Analytical
www.pacelabs.com

Workorder: 10160851 **Workorder Name:** Black Pine Mine **Results Requested** 6/30/2011

Denise Jensen
Pace Analytical Billings MT
602 S 25th Street
Billings, MT 591014549
Phone (406)254-7226
Email: denise.jensen@pacelabs.com

Pace Analytical P.O.
315 Chestnut St
Virginia, MN 55792

					General							LAB USE ONLY
1	CML-SW-17	6/14/2011 18:10	10160851001	Water								492249
2	TSP-6	6/14/2011 13:50	10160851002	Water								492250
3	TSP-8	6/13/2011 16:45	10160851003	Water								492251
4	CML- SW- 07	6/14/2011 10:05	10160851004	Water								492252
5	TSP-3	6/13/2011 15:30	10160851005	Water								492253
6	TSP-9	6/13/2011 17:30	10160851006	Water								492254
7	FIELD BLANK 1	6/13/2011 17:45	10160851007	Water								492255
8	MCSP- 1	6/13/2011 14:40	10160851008	Water								492256
9	CML-SW-06	6/13/2011 16:30	10160851009	Water								492257
10												
11												
12												
13												

X 1,631 E Hg

Transfers	Released By	Date/Time	Received By	Date/Time
1	Melissa C. Trabelle/Pace	6/20/11 1630	Carrie J. Oster	6-21-11 1530
2				
3				
4				
5				

RL = 0.01 ng/L

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www.pacelabs.com

CHAIN-OF-CUSTODY / Analytical Request Document

The Chain-of-Custody is a LEGAL DOCUMENT. All relevant fields must be completed accurately.

Page: 1 of 1

1321642

Section A Required Client Information:

Company: Herrera site
Address: 101 E Broadway 610
Missoula, MT 59802
Email To: KhouckCherreraInc.com
Phone: 406 721 6889 Fax:
Requested Due Date/TAT: Std.

Section B Required Project Information:

Report To: Kevin Houck
Copy To:
Purchase Order No.:
Project Name: Black Pine Mine
Project Number: 06-03425-015

Section C Invoice Information:

Attention:
Company Name: DEQ
Address:
Pace Quote Reference:
Pace Project Manager:
Pace Profile #:

REGULATORY AGENCY

☐ NPDES ☐ GROUND WATER ☐ DRINKING WATER
☐ UST ☐ RCRA ☐ OTHER _____

Site Location STATE: MT

Section D Required Client Information

SAMPLE ID
(A-Z, 0-9 / ,-)
Sample IDs MUST BE UNIQUE

Matrix Codes MATRIX / CODE

Drinking Water	DW
Water	WT
Waste Water	WW
Product	P
Soil/Solid	SL
Oil	OL
Wipe	WP
Air	AR
Tissue	TS
Other	OT

Requested Analysis Filtered (Y/N)

ITEM #	SAMPLE ID	MATRIX CODE (see valid codes to left)	SAMPLE TYPE (G=GRAB C=COMP)	COLLECTED COMPOSITE START DATE	COLLECTED COMPOSITE START TIME	COLLECTED COMPOSITE END/GRAB DATE	COLLECTED COMPOSITE END/GRAB TIME	SAMPLE TEMP AT COLLECTION	# OF CONTAINERS	Preservatives: Unpreserved	H_2SO_4	HNO_3	HCl	NaOH	$Na_2S_2O_3$	Methanol	Other	Analysis Test Y/N: LL Hg	Residual Chlorine (Y/N)	Pace Project No./ Lab I.D.
1	CML-SW-17	WG				6/14/11	18:10		1	X								X		001
2	TSP-6					↓	13:50													002
3	TSP-8					6/13/11	1645													003
4	~~SW~~ CML-SW-07					6/14/11	10:05													004
5	TSP-3					6/13/11	1530													005
6	TSP-9						1730													006
7	Field blank 1						1745													007
8	MCSP-1						1440													008
9	CML-SW-06					↓	1630		↓	↓								↓		~~008~~ 009 RWW 6/20/11
10																				
11																				
12																				

10160857

ADDITIONAL COMMENTS	RELINQUISHED BY / AFFILIATION	DATE	TIME	ACCEPTED BY / AFFILIATION	DATE	TIME	SAMPLE CONDITIONS: Temp in °C	Received on Ice (Y/N)	Custody Sealed Cooler (Y/N)	Samples Intact (Y/N)
	KDCook / Herrera	6/15/11	0900	Ray Valy PACE	6/17/11	850	22.2	N	Y	Y

ORIGINAL

SAMPLER NAME AND SIGNATURE
PRINT Name of SAMPLER:
SIGNATURE of SAMPLER: DATE Signed (MM/DD/YY):

*Important Note: By signing this form you are accepting Pace's NET 30 day payment terms and agreeing to late charges of 1.5% per month for any invoices not paid within 30 days.

F-ALL-Q-020rev.07, 15-May-2007

Sample Condition Upon Receipt

Pace Analytical

Client Name: Herrera Env. (DEQ) Project # 10160851

Courier: (67) ☒ Fed Ex ☐ UPS ☐ USPS ☐ Client ☐ Commercial ☐ Pace Other _____

Tracking #: 879718460013561

[redacted]

Custody Seal on Cooler/Box Present: ☒ yes ☐ no Seals intact: ☒ yes ☐ no

Packing Material: ☐ Bubble Wrap ☒ Bubble Bags ☐ None ☐ Other _____ Temp Blank: Yes ____ No X

Thermometer Used (1383045) or 135 Type of Ice: Wet Blue (None) ☐ Samples on ice, cooling process has begun

Cooler Temperature 22.2 Biological Tissue is Frozen: Yes No

Date and Initials of person examining contents: RW 6/29/11

Temp should be above freezing to 6°C

Comments:

Chain of Custody Present:	☒Yes ☐No ☐N/A	1.
Chain of Custody Filled Out:	☒Yes ☐No ☐N/A	2.
Chain of Custody Relinquished:	☒Yes ☐No ☐N/A	3.
Sampler Name & Signature on COC:	☐Yes ☒No ☐N/A	4.
Samples Arrived within Hold Time:	☒Yes ☐No ☐N/A	5.
Short Hold Time Analysis (<72hr):	☐Yes ☒No ☐N/A	6.
Rush Turn Around Time Requested:	☐Yes ☒No ☐N/A	7.
Sufficient Volume:	☒Yes ☐No ☐N/A	8.
Correct Containers Used:	☒Yes ☐No ☐N/A	9.
-Pace Containers Used:	☒Yes ☐No ☐N/A	
Containers Intact:	☒Yes ☐No ☐N/A	10.
Filtered volume received for Dissolved tests	☐Yes ☐No ☒N/A	11.
Sample Labels match COC:	☒Yes ☐No ☐N/A	12.
-Includes date/time/ID/Analysis Matrix: AQ		
All containers needing acid/base preservation have been checked. Noncompliance are noted in 13.	☐Yes ☐No ☒N/A	13. ☐ HNO3 ☐ H2SO4 ☐ NaOH ☐ HCl Samp #
All containers needing preservation are found to be in compliance with EPA recommendation.	☐Yes ☐No ☒N/A	
Exceptions: VOA,Coliform, TOC, Oil and Grease, WI-DRO (water)	☐Yes ☒No	Initial when completed / Lot # of added preservative
Samples checked for dechlorination:	☐Yes ☐No ☒N/A	14.
Headspace in VOA Vials (>6mm):	☐Yes ☐No ☒N/A	15.
Trip Blank Present:	☒Yes ☐No ☒N/A	16.
Trip Blank Custody Seals Present	☐Yes ☐No ☒N/A	
Pace Trip Blank Lot # (if purchased):		

RW 6/29/11

Client Notification/ Resolution: Field Data Required? Y / N

Person Contacted: _____ Date/Time: _____

Comments/ Resolution: _____

Project Manager Review: _____ **Date:** 6-29-11

Note: Whenever there is a discrepancy affecting North Carolina compliance samples, a copy of this form will be sent to the North Carolina DEHNR Certification Office (i.e out of hold, incorrect preservative, out of temp, incorrect containers)

Pace Analytical Services, Inc.
602 S 25th Street
Billings, MT 591014549
(406)254-7226

June 30, 2011

Kevin Houck
Herrera Environmental Consultants
101 East Broadway, Suite 610
Missoula, MT 59802

RE: Project: Black Pine Mine
Pace Project No.: 10160853

Dear Kevin Houck:
Enclosed are the analytical results for sample(s) received by the laboratory on June 17, 2011. The results relate only to the samples included in this report.

The mercury analysis was performed by the Pace Analytical Services Virginia, MN laboratory. The report of their analysis is attached.

If you have any questions concerning this report, please feel free to contact me.

Sincerely,

Denise Jensen

denise.jensen@pacelabs.com
Project Manager

Enclosures

cc: Devin Clary, Montana Dept. of Environmental Quality
Mark Donner, Trihydro

REPORT OF LABORATORY ANALYSIS

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without the written consent of Pace Analytical Services, Inc..

Pace Analytical Services, Inc.
602 S 25th Street
Billings, MT 591014549
(406)254-7226

SAMPLE SUMMARY

Project: Black Pine Mine
Pace Project No.: 10160853

Lab ID	Sample ID	Matrix	Date Collected	Date Received
10160853001	**CML-SW-09**	Water	06/15/11 15:13	06/17/11 08:50
10160853002	**CML-SW-11**	Water	06/15/11 14:16	06/17/11 08:50
10160853003	**CML-SW-03**	Water	06/15/11 08:20	06/17/11 08:50
10160853004	**CML-SW-14**	Water	06/15/11 13:29	06/17/11 08:50
10160853005	**CML-SW-16**	Water	06/15/11 14:09	06/17/11 08:50
10160853006	**CML-SW-01**	Water	06/15/11 15:49	06/17/11 08:50
10160853007	**CML-SW-08**	Water	06/15/11 15:20	06/17/11 08:50
10160853008	**CML-SW-18**	Water	06/15/11 15:30	06/17/11 08:50
10160853009	**CML-SW-15**	Water	06/15/11 13:35	06/17/11 08:50
10160853010	**CML-SW-10**	Water	06/15/11 14:51	06/17/11 08:50
10160853011	**CML-SW-05**	Water	06/15/11 12:35	06/17/11 08:50
10160853012	**CML-SW-13**	Water	06/15/11 12:39	06/17/11 08:50
10160853013	**CML-SW-02**	Water	06/15/11 14:03	06/17/11 08:50
10160853014	**CML-SW-04**	Water	06/15/11 13:20	06/17/11 08:50
10160853015	**CML-SW-19**	Water	06/15/11 12:59	06/17/11 08:50
10160853016	**FIELD BLANK 2**	Water	06/16/11 11:40	06/17/11 08:50

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Pace Analytical Services, Inc.
602 S 25th Street
Billings, MT 591014549
(406)254-7226

PROJECT NARRATIVE

Project:
Pace Project No.:

Method:
Description:
Client:
Date:

This data package has been reviewed for quality and completeness and is approved for release.

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, Inc..

Thursday, June 30, 2011

Pace Analytical®
Laboratory Results

Pace Analytical Billings
Attn: Denise Jensen
602 S 25th Street
Billings, MT 591014549

RE: WO# 10160853- Black Pine Mine; Pace COC116258

Dear Ms. Jensen,

Enclosed are the analytical results for the samples received by the laboratory on June 21, 2011.

If you have any questions concerning this report, please feel free to contact me at 218-742-1007.

Sincerely,

Jennifer Tarnowski
Project Manager

ACCREDITED IN ACCORDANCE WITH ... ilac

SAMPLE SUMMARY

Pace Analytical Services
315 Chestnut Street
PO Box 1212
Virginia, MN 55792
Phone: 218-742-1042
Fax: 218-742-1010

Laboratory Results

Virginia MDH Certification: 027-137-445
Duluth MDH Certification: 027-137-446

PACE COC: 116258

Client: - Pace Analytical Billings
Project: VM13294 - Black Pine Mine
Sampled By: Client
Report Date: 6/30/2011

Sample Description	Sample ID	Sample Type	Matrix	Sample Date	Received Date
CML-SW-09 (10160853001)	492258	Grab	Aqueous	6/15/2011 15:13	6/21/2011 15:30
CML-SW-11 (10160853002)	492259	Grab	Aqueous	6/15/2011 14:16	6/21/2011 15:30
CML-SW-03 (10160853003)	492260	Grab	Aqueous	6/15/2011 08:20	6/21/2011 15:30
CML-SW-14 (10160853004)	492261	Grab	Aqueous	6/15/2011 13:29	6/21/2011 15:30
CML-SW-16 (10160853005)	492262	Grab	Aqueous	6/15/2011 14:09	6/21/2011 15:30
CML-SW-01 (10160853006)	492263	Grab	Aqueous	6/15/2011 15:49	6/21/2011 15:30
CML-SW-08 (10160853007)	492264	Grab	Aqueous	6/15/2011 15:20	6/21/2011 15:30
CML-SW-18 (10160853008)	492265	Grab	Aqueous	6/15/2011 15:30	6/21/2011 15:30
CML-SW-15 (10160853009)	492266	Grab	Aqueous	6/15/2011 13:35	8/21/2011 15:30
CML-SW-10 (10160853010)	492267	Grab	Aqueous	6/15/2011 14:51	6/21/2011 15:30
CML-SW-05 (10160853011)	492268	Grab	Aqueous	6/15/2011 12:35	6/21/2011 15:30
CML-SW-13 (10160853012)	492270	Grab	Aqueous	6/15/2011 12:39	6/21/2011 15:30
CML-SW-02 (10160853013)	492271	Grab	Aqueous	6/15/2011 14:03	6/21/2011 15:30
CML-SW-04 (10160853014)	492272	Grab	Aqueous	6/15/2011 13:20	6/21/2011 15:30
CML-SW-19 (10160853015)	492274	Grab	Aqueous	6/15/2011 12:59	6/21/2011 15:30
FIELD BLANK 2 (10160853016)	492275	Grab	Aqueous	6/16/2011 11:40	6/21/2011 15:30

This report may not be reproduced, except in full, without written consent of Pace Analytical.
Results apply only to the sample received. Results for solid matrices are based on dry weight, unless noted.
Analysis was performed in accordance with methods approved by the US EPA and the Minnesota Department of Health, where applicable, unless noted in the report.

SAMPLE RESULTS

PACE Sample: 492258
Description: CML-SW-09 (10160853001)
Sample Date: 6/15/2011 3:13:00 PM

Matrix: Aqueous
Sample Type: Grab

PACE COC: 116258
Client: - Pace Analytical Billings
Project: VM13294 - Black Pine Mine
Sampled By: Client
Report Date: 6/30/2011
Rec'd Temperature: 18.4 °C

Analyte	Result	RL	Units	Method	Prepared Date	Analysis Date	Batch ID
Mercury, Low Level	178	10	ng/L	EPA 1631E	6/24/2011	6/27/2011	L-062811-A

SAMPLE RESULTS

PACE Sample: 492259
Description: CML-SW-11 (10160853002)
Sample Date: 6/15/2011 2:16:00 PM

Matrix: Aqueous
Sample Type: Grab

PACE COC: 116258
Client: - Pace Analytical Billings
Project: VM13294 - Black Pine Mine
Sampled By: Client
Report Date: 6/30/2011
Rec'd Temperature: 18.4 °C

Analyte	Result	RL	Units	Method	Prepared Date	Analysis Date	Batch ID
Mercury, Low Level	196	10	ng/L	EPA 1631E	6/24/2011	6/27/2011	L-062811-A

SAMPLE RESULTS

PACE Sample: 492260
Description: CML-SW-03 (10160853003)
Sample Date: 6/15/2011 8:20:00 AM

Matrix: Aqueous
Sample Type: Grab

PACE COC: 116258
Client: - Pace Analytical Billings
Project: VM13294 - Black Pine Mine
Sampled By: Client
Report Date: 6/30/2011
Rec'd Temperature: 18.4 °C

Analyte	Result	RL	Units	Method	Prepared Date	Analysis Date	Batch ID
Mercury, Low Level	123	10	ng/L	EPA 1631E	6/24/2011	6/27/2011	L-062811-A

SAMPLE RESULTS

PACE Sample: 492261
Description: CML-SW-14 (10160853004)
Sample Date: 6/15/2011 1:29:00 PM

Matrix: Aqueous
Sample Type: Grab

PACE COC: 116258
Client: - Pace Analytical Billings
Project: VM13294 - Black Pine Mine
Sampled By: Client
Report Date: 6/30/2011
Rec'd Temperature: 18.4 °C

Analyte	Result	RL	Units	Method	Prepared Date	Analysis Date	Batch ID
Mercury, Low Level	29.2	10	ng/L	EPA 1631E	6/24/2011	6/27/2011	L-062811-A

SAMPLE RESULTS

PACE Sample: 492262
Description: CML-SW-16 (10160853005)
Sample Date: 6/15/2011 2:09:00 PM

Matrix: Aqueous
Sample Type: Grab

PACE COC: 116258
Client: - Pace Analytical Billings
Project: VM13294 - Black Pine Mine
Sampled By: Client
Report Date: 6/30/2011
Rec'd Temperature: 18.4 °C

Analyte	Result	RL	Units	Method	Prepared Date	Analysis Date	Batch ID
Mercury, Low Level	120	10	ng/L	EPA 1631E	6/24/2011	6/27/2011	L-062811-A

SAMPLE RESULTS

PACE Sample: 492263
Description: CML-SW-01 (10160853006)
Sample Date: 6/15/2011 3:49:00 PM

Matrix: Aqueous
Sample Type: Grab

PACE COC: 116256
Client: - Pace Analytical Billings
Project: VM13294 - Black Pine Mine
Sampled By: Client
Report Date: 6/30/2011
Rec'd Temperature: 18.4 °C

Analyte	Result	RL	Units	Method	Prepared Date	Analysis Date	Batch ID
Mercury, Low Level	357	10	ng/L	EPA 1631E	6/24/2011	6/27/2011	L-062811-A

SAMPLE RESULTS

PACE Sample: 492264
Description: CML-SW-08 (10160853007)
Sample Date: 6/15/2011 3:20:00 PM

Matrix: Aqueous
Sample Type: Grab

PACE COC: 116258
Client: - Pace Analytical Billings
Project: VM13294 - Black Pine Mine
Sampled By: Client
Report Date: 6/30/2011
Rec'd Temperature: 18.4 °C

Analyte	Result	RL	Units	Method	Prepared Date	Analysis Date	Batch ID
Mercury, Low Level	193	10	ng/L	EPA 1631E	6/24/2011	6/27/2011	L-062811-A

SAMPLE RESULTS

PACE Sample: 492265
Description: CML-SW-18 (10160853008)
Sample Date: 6/15/2011 3:30:00 PM

Matrix: Aqueous
Sample Type: Grab

PACE COC: 116258
Client: - Pace Analytical Billings
Project: VM13294 - Black Pine Mine
Sampled By: Client
Report Date: 6/30/2011
Rec'd Temperature: 18.4 °C

Analyte	Result	RL	Units	Method	Prepared Date	Analysis Date	Batch ID
Mercury, Low Level	7.1	0.5	ng/L	EPA 1631E	6/24/2011	6/27/2011	L-062811-A

SAMPLE RESULTS

PACE Sample: 492266
Description: CML-SW-15 (10160853009)
Sample Date: 6/15/2011 1:35:00 PM

Matrix: Aqueous
Sample Type: Grab

PACE COC: 116258
Client: - Pace Analytical Billings
Project: VM13294 - Black Pine Mine
Sampled By: Client
Report Date: 6/30/2011
Rec'd Temperature: 18.4 °C

Analyte	Result	RL	Units	Method	Prepared Date	Analysis Date	Batch ID
Mercury, Low Level	33.6	10	ng/L	EPA 1631E	6/24/2011	6/27/2011	L-062811-A

SAMPLE RESULTS

PACE Sample: 492267
Description: CML-SW-10 (10160853010)
Sample Date: 6/15/2011 2:51:00 PM

Matrix: Aqueous
Sample Type: Grab

PACE COC: 116258
Client: - Pace Analytical Billings
Project: VM13294 - Black Pine Mine
Sampled By: Client
Report Date: 6/30/2011
Rec'd Temperature: 18.4 °C

Analyte	Result	RL	Units	Method	Prepared Date	Analysis Date	Batch ID
Mercury, Low Level	221	10	ng/L	EPA 1631E	6/24/2011	6/27/2011	L-062811-A

SAMPLE RESULTS

PACE Sample: 492268
Description: CML-SW-05 (10160853011)
Sample Date: 6/15/2011 12:35:00 PM

Matrix: Aqueous
Sample Type: Grab

PACE COC: 116258
Client: - Pace Analytical Billings
Project: VM13294 - Black Pine Mine
Sampled By: Client
Report Date: 6/30/2011
Rec'd Temperature: 18.4 °C

Analyte	Result	RL	Units	Method	Prepared Date	Analysis Date	Batch ID
Mercury, Low Level	4.2	0.5	ng/L	EPA 1631E	6/24/2011	6/27/2011	L-062811-A

SAMPLE RESULTS

PACE Sample: 492270
Description: CML-SW-13 (10160853012)
Sample Date: 6/15/2011 12:39:00 PM

Matrix: Aqueous
Sample Type: Grab

PACE COC: 116258
Client: - Pace Analytical Billings
Project: VM13294 - Black Pine Mine
Sampled By: Client
Report Date: 6/30/2011
Rec'd Temperature: 18.4 °C

Analyte	Result	RL	Units	Method	Prepared Date	Analysis Date	Batch ID
Mercury, Low Level	6.0	0.5	ng/L	EPA 1631E	6/24/2011	6/27/2011	L-062811-A

SAMPLE RESULTS

PACE Sample: 492271
Description: CML-SW-02 (10160853013)
Sample Date: 6/15/2011 2:03:00 PM

Matrix: Aqueous
Sample Type: Grab

PACE COC: 116258
Client: - Pace Analytical Billings
Project: VM13294 - Black Pine Mine
Sampled By: Client
Report Date: 6/30/2011
Rec'd Temperature: 18.4 °C

Analyte	Result	RL	Units	Method	Prepared Date	Analysis Date	Batch ID
Mercury, Low Level	77.2	10	ng/L	EPA 1631E	6/24/2011	6/27/2011	L-062811-A

SAMPLE RESULTS

PACE Sample: 492272
Description: CML-SW-04 (10160853014)
Sample Date: 6/15/2011 1:20:00 PM

Matrix: Aqueous
Sample Type: Grab

PACE COC: 116258
Client: - Pace Analytical Billings
Project: VM13294 - Black Pine Mine
Sampled By: Client
Report Date: 6/30/2011
Rec'd Temperature: 18.4 °C

Analyte	Result	RL	Units	Method	Prepared Date	Analysis Date	Batch ID
Mercury, Low Level	33.7	10	ng/L	EPA 1631E	6/24/2011	6/27/2011	L-062811-A

SAMPLE RESULTS

PACE Sample: 492274
Description: CML-SW-19 (10160853015)
Sample Date: 6/15/2011 12:59:00 PM

Matrix: Aqueous
Sample Type: Grab

PACE COC: 116258
Client: - Pace Analytical Billings
Project: VM13294 - Black Pine Mine
Sampled By: Client
Report Date: 6/30/2011
Rec'd Temperature: 18.4 °C

Analyte	Result	RL	Units	Method	Prepared Date	Analysis Date	Batch ID
Mercury, Low Level	6.2	0.5	ng/L	EPA 1631E	6/24/2011	6/27/2011	L-062811-A

SAMPLE RESULTS

PACE Sample: 492275
Description: FIELD BLANK 2 (10160853016)
Sample Date: 6/16/2011 11:40:00 AM

Matrix: Aqueous
Sample Type: Grab

PACE COC: 116258
Client: - Pace Analytical Billings
Project: VM13294 - Black Pine Mine
Sampled By: Client
Report Date: 6/30/2011
Rec'd Temperature: 18.4 °C

Analyte	Result	RL	Units	Method	Prepared Date	Analysis Date	Batch ID
Mercury, Low Level	<0.5	0.5	ng/L	EPA 1631E	6/24/2011	6/27/2011	L-062811-A

QC REPORT for 116258

Mercury, Low Level

QC Batch ID: L-062811-A

Description	Result	RL	Method	Spike Level	Source Result	Spike %R	%R Limits	RPD	RPD Limit
492069 MS	8.49 ng/L	0.5	EPA 1631E	5	2.7	117	71-125	NA	NA
492069 MSD	8.36 ng/L	0.5	EPA 1831E	5	2.7	114	71-125	1.6	24
492084 MS	9.83 ng/L	0.5	EPA 1631E	5	4.9	99.2	71-125	NA	NA
492084 MSD	9.81 ng/L	0.5	EPA 1631E	5	4.9	98.8	71-125	0.2	24
493596 MB	<0.5 ng/L	0.5	EPA 1631E	NA	NA	NA	NA	NA	NA
493596 MB	<0.5 ng/L	0.5	EPA 1631E	NA	NA	NA	NA	NA	NA
493597 LCS	5.40 ng/L	0.5	EPA 1631E	5	NA	108	77-123	NA	NA
493604 MB	<0.5 ng/L	0.5	EPA 1631E	NA	NA	NA	NA	NA	NA
493605 LCS	5.50 ng/L	0.5	EPA 1631E	5	NA	110	77-123	NA	NA
493612 MB	<0.5 ng/L	0.5	EPA 1631E	NA	NA	NA	NA	NA	NA
493613 LCS	4.86 ng/L	0.5	EPA 1631E	5	NA	97.1	77-123	NA	NA

Note:
LCS: Laboratory Control Sample; LCSD: Laboratory Control Sample Duplicate; Dup: Sample Duplicate; MB: Method Blank; MS: Matrix Spike; MSD: Matrix Spike Duplicate; RL: Reporting Limit; RPD: Relative Percent Difference.
The source result represents the sample result.

Pace Analytical	Document Name: Sample Condition Upon Receipt Form	Document Revision: 20June2011 Page 1 of 1
	Document No: F-VM-C-001Rev.01	Issuing Authority: Pace Virginia Minnesota Quality Office

Client Name: Pace Project # 116258

Courier: ☒ Fed Ex ☐ UPS ☐ USPS ☐ Client ☐ Commercial ☐ Pace Other _____

Tracking #: 5022 0763 0061

Custody Seal on Cooler/Box Present: ☒ yes ☐ no Seals intact: ☒ yes ☐ no N/A

Packing Material: ☐ Bubble Wrap ☒ Bubble Bags ☒ None ☐ Other _____ Temp Blank: Yes ____ No ☒

Thermometer Used 101594812 Type of Ice: Wet Blue (None) ☐ Samples on ice, cooling process has begun

Cooler Temperature 18.4 Biological Tissue is Frozen: Yes No (N/A)

Temp should be above freezing to 6°C Comments:

Date and initials of person examining contents: dlm 6/21/11

Chain of Custody Present:	☒Yes ☐No ☐N/A	1.	
Chain of Custody Filled Out:	☒Yes ☐No ☐N/A	2.	
Chain of Custody Relinquished:	☒Yes ☐No ☐N/A	3.	
Sampler Name & Signature on COC:	☐Yes ☒No ☐N/A	4.	
Samples Arrived within Hold Time:	☒Yes ☐No ☐N/A	5.	
Short Hold Time Analysis (<72hr):	☐Yes ☒No ☐N/A	6.	
Rush Turn Around Time Requested:	☐Yes ☐No ☒N/A	7.	6/30/11
Sufficient Volume:	☒Yes ☐No ☐N/A	8.	
Correct Containers Used:	☒Yes ☐No ☐N/A	9.	
-Pace Containers Used:	☒Yes ☐No ☐N/A		
Containers Intact:	☒Yes ☐No ☐N/A	10.	
Filtered volume received for Dissolved tests	☐Yes ☐No ☒N/A	11.	
Sample Labels match COC:	☒Yes ☐No ☐N/A	12.	
-Includes date/time/ID/Analysis Matrix:			
All containers needing acid/base preservation will be checked and documented in the pH logbook		13.	See pH log for results and additional preservation documentation
Headspace in VOA Vials (>6mm):	☐Yes ☐No ☒N/A	14.	
Trip Blank Present:	☐Yes ☐No ☒N/A	15.	
Trip Blank Custody Seals Present	☐Yes ☐No ☒N/A		
Pace Trip Blank Lot # :			

Client Notification/ Resolution: Field Data Required? Y / N

Person Contacted: Denise Jensen Date/Time: 6/22/11 0935

Comments/ Resolution:

* Contacted Denise by email to verify no artificial is needed. We will analyze samples. Heather Stoltz 6/22/11

Project Manager Review: [signature] Date: 6/22/11

116258

Chain of Custody

Pace Analytical®
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Workorder: 10160853 **Workorder Name:** Black Pine Mine **Results Requested** 6/30/2011

Denise Jensen
Pace Analytical Billings MT
602 S 25th Street
Billings, MT 591014549
Phone (406)254-7226
Email: denise.jensen@pacelabs.com

Pace Analytical P.O._____
315 Chestnut St
Virginia, MN 55792

					General																		LAB USE ONLY
1	CML-SW-09	6/15/2011 15:13	10160853001	Water							x												492258
2	CML-SW-11	6/15/2011 14:16	10160853002	Water																			492259
3	CML-SW-03	6/15/2011 08:20	10160853003	Water																			492260
4	CML-SW-14	6/15/2011 13:29	10160853004	Water																			492261
5	CML-SW-16	6/15/2011 14:09	10160853005	Water																			492262
6	CML-SW-01	6/15/2011 15:49	10160853006	Water																			492263
7	CML-SW-08	6/15/2011 15:20	10160853007	Water																			492264
8	CML-SW-18	6/15/2011 15:30	10160853008	Water																			492265
9	CML-SW-15	6/15/2011 13:35	10160853009	Water																			492266
10	CML-SW-10	6/15/2011 14:51	10160853010	Water																			492267
11	CML-SW-05	6/15/2011 12:35	10160853011	Water																			492268
12	CML-SW-13	6/15/2011 12:39	10160853012	Water																			492270
13	CML-SW-02	6/15/2011 14:03	10160853013	Water																			492271
14	CML-SW-04	6/15/2011 13:20	10160853014	Water																			492272
15	CML-SW-19	6/15/2011 12:59	10160853015	Water																			492274
16	FIELD BLANK 2	6/16/2011 11:40	10160853016	Water																			492275
17																							
18																							
19																							
20																							

Transfers	Released By	Date/Time	Received By	Date/Time
1	Norma C. Frankele/Pace	6/20/11 1630	Carrie Ostrander	6-21-11 1530
2				
3				
4				
5				

0.01 ug/L RL

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CHAIN-OF-CUSTODY / Analytical Request Document

The Chain-of-Custody is a LEGAL DOCUMENT. All relevant fields must be completed accurately.

1321640

Section A Required Client Information:	Section B Required Project Information:	Section C Invoice Information:
Company: Herrera	Report To: Kevin Hauck	Attention:
Address: Her	Copy To:	Company Name: DEQ
		Address:
Email To:	Purchase Order No.:	Pace Quote Reference:
Phone: Fax:	Project Name: Black Pine Mine	Pace Project Manager:
Requested Due Date/TAT:	Project Number:	Pace Profile #:

REGULATORY AGENCY: ☐ NPDES ☐ GROUND WATER ☐ DRINKING WATER ☐ UST ☐ RCRA ☐ OTHER _____

Site Location STATE: _____

Section D Required Client Information

SAMPLE ID (A-Z, 0-9 / ,-) Sample IDs MUST BE UNIQUE

Matrix Codes — MATRIX / CODE: Drinking Water DW; Water WT; Waste Water WW; Product P; Soil/Solid SL; Oil OL; Wipe WP; Air AR; Tissue TS; Other OT

Requested Analysis Filtered (Y/N)

ITEM #	SAMPLE ID	MATRIX CODE (see valid codes to left)	SAMPLE TYPE (G=GRAB C=COMP)	COLLECTED: COMPOSITE START DATE	COMPOSITE START TIME	COMPOSITE END/GRAB DATE	COMPOSITE END/GRAB TIME	SAMPLE TEMP AT COLLECTION	# OF CONTAINERS	Preservatives: Unpreserved	H_2SO_4	HNO_3	HCl	NaOH	$Na_2S_2O_3$	Methanol	Other	Y/N: N	Analysis Test: LL Hg	Residual Chlorine (Y/N)	Pace Project No./ Lab I.D.
1	CML-SW-09	W	G			6/15/11	1513		1	X								X	X		001
2	CML-SW-11						1416		1	X								X	X		002
3	CML-SW-03						0820		1	X								X	X		003
4	CML-SW-14						1329		1	X								X	X		004
5	CML-SW-16						1409		1	X								X	X		005
6	CML-SW-01						1549		1	X								X	X		006
7	CML-SW-08						1520		1	X								X	X		007
8	CML-SW-18						1530		1	X								X	X		008
9	CML-SW-15						1335		1	X								X	X		009
10	CML-SW-10						1451		1	X								X	X		010
11	CML-SW-05						1235		1	X								X	X		011
12	CML-SW-13						1239		1	X								X	X		012

Vgp 20-11

10160853

ADDITIONAL COMMENTS	RELINQUISHED BY / AFFILIATION	DATE	TIME	ACCEPTED BY / AFFILIATION	DATE	TIME	SAMPLE CONDITIONS			
ALL "SML" on bottles should be "CML"	[signature] / Herrera	6/16/11	1150	Ragel Moly PACE	6/17/11	0850	21.6	N	Y	Y

ORIGINAL

SAMPLER NAME AND SIGNATURE

PRINT Name of SAMPLER: Gina Catarra

SIGNATURE of SAMPLER: [signature] DATE Signed (MM/DD/YY): 6/16/11

Temp in °C | Received on Ice (Y/N) | Custody Sealed Cooler (Y/N) | Samples Intact (Y/N)

*Important Note: By signing this form you are accepting Pace's NET 30 day payment terms and agreeing to late charges of 1.5% per month for any invoices not paid within 30 days.

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CHAIN-OF-CUSTODY / Analytical Request Document

The Chain-of-Custody is a LEGAL DOCUMENT. All relevant fields must be completed accurately.

Page: 2 of 2

1321609

Section A Required Client Information:	Section B Required Project Information:	Section C Invoice Information:
Company: Hervera	Report To: Kevin Houck	Attention:
Address:	Copy To:	Company Name: DEQ
		Address:
Email To:	Purchase Order No.:	Pace Quote Reference:
Phone: Fax:	Project Name: Black Pine Mine	Pace Project Manager:
Requested Due Date/TAT:	Project Number:	Pace Profile #:

REGULATORY AGENCY

☐ NPDES ☐ GROUND WATER ☐ DRINKING WATER

☐ UST ☐ RCRA ☐ OTHER _____

Site Location STATE: _____

Section D Required Client Information

SAMPLE ID
(A-Z, 0-9 / ,-)
Sample IDs MUST BE UNIQUE

Matrix Codes (MATRIX / CODE)

Drinking Water	DW
Water	WT
Waste Water	WW
Product	P
Soil/Solid	SL
Oil	OL
Wipe	WP
Air	AR
Tissue	TS
Other	OT

Requested Analysis Filtered (Y/N)

ITEM #	SAMPLE ID	MATRIX CODE (see valid codes to left)	SAMPLE TYPE (G=GRAB C=COMP)	COLLECTED COMPOSITE START DATE	COMPOSITE START TIME	COMPOSITE END/GRAB DATE	COMPOSITE END/GRAB TIME	SAMPLE TEMP AT COLLECTION	# OF CONTAINERS	Preservatives: Unpreserved	H_2SO_4	HNO_3	HCl	NaOH	$Na_2S_2O_3$	Methanol	Other	Analysis Test (Y/N): LL Hg	Residual Chlorine (Y/N)	Pace Project No./ Lab I.D.
1	CML-SW-02	WW	G			6/15/11	1403		1	X								X		10160853 013
2	CML-SW-04	"	"			"	1320		1	X								X		014
3	CML-SW-19	"	"			"	1259		1	X								X		015
4	Field blank 2	"	"			6/16/11	1140		1	X								X		016
5																				
6																				
7																				
8																				
9																				
10																				
11																				
12																				

ADDITIONAL COMMENTS	RELINQUISHED BY / AFFILIATION	DATE	TIME	ACCEPTED BY / AFFILIATION	DATE	TIME	SAMPLE CONDITIONS			
ALL "SML" on bottles should be "CML"	Gina Caturra/Hervera	6/16/11	1150	Ray Valy PACE	6/17/11	0850	81.6	N	Y	Y

ORIGINAL

SAMPLER NAME AND SIGNATURE

PRINT Name of SAMPLER: Gina Caturra

SIGNATURE of SAMPLER: [signature] DATE Signed (MM/DD/YY): 6/16/11

Temp In °C | Received on Ice (Y/N) | Custody Sealed Cooler (Y/N) | Samples Intact (Y/N)

*Important Note: By signing this form you are accepting Pace's NET 30 day payment terms and agreeing to late charges of 1.5% per month for any invoices not paid within 30 days.

F-ALL-Q-020rev.07, 15-May-2007

Sample Condition Upon Receipt

Pace Analytical

Client Name: Herrera

Project # 10160853

Courier: ☒ Fed Ex ☐ UPS ☐ USPS ☐ Client ☐ Commercial ☐ Pace Other _____

Tracking #: 879718460613264

Custody Seal on Cooler/Box Present: ☒ yes ☐ no Seals intact: ☒ yes ☐ no

Packing Material: ☐ Bubble Wrap ☒ Bubble Bags ☐ None ☐ Other _____ Temp Blank: Yes ____ No ☒

Thermometer Used: 1383045 or 135 Type of Ice: Wet Blue (None) ☐ Samples on ice, cooling process has begun

Cooler Temperature: 21.6 Biological Tissue is Frozen: Yes No

Temp should be above freezing to 6°C

Date and Initials of person examining contents: RW 6/20/11

Comments:

Chain of Custody Present:	☒Yes ☐No ☐N/A	1.
Chain of Custody Filled Out:	☒Yes ☐No ☐N/A	2.
Chain of Custody Relinquished:	☒Yes ☐No ☐N/A	3.
Sampler Name & Signature on COC:	☒Yes ☐No ☐N/A	4.
Samples Arrived within Hold Time:	☒Yes ☐No ☐N/A	5.
Short Hold Time Analysis (<72hr):	☐Yes ☒No ☐N/A	6.
Rush Turn Around Time Requested:	☐Yes ☒No ☐N/A	7.
Sufficient Volume:	☒Yes ☐No ☐N/A	8.
Correct Containers Used:	☒Yes ☐No ☐N/A	9.
-Pace Containers Used:	☒Yes ☐No ☐N/A	
Containers Intact:	☒Yes ☐No ☐N/A	10.
Filtered volume received for Dissolved tests	☐Yes ☐No ☒N/A	11.
Sample Labels match COC:	☒Yes ☐No ☐N/A	12. "All "5ML" on bottles should be "cmL"
-Includes date/time/ID/Analysis Matrix: Ag		
All containers needing acid/base preservation have been checked. Noncompliance are noted in 13.	☐Yes ☐No ☒N/A	13. ☐ HNO3 ☐ H2SO4 ☐ NaOH ☐ HCl Samp #
All containers needing preservation are found to be in compliance with EPA recommendation.	☐Yes ☐No ☒N/A	
Exceptions: VOA,Coliform, TOC, Oil and Grease, WI-DRO (water)	☐Yes ☒No	Initial when completed ____ Lot # of added preservative ____
Samples checked for dechlorination:	☐Yes ☐No ☒N/A	14.
Headspace in VOA Vials (>6mm):	☐Yes ☐No ☒N/A	15.
Trip Blank Present:	☐Yes ☐No ☒N/A	16.
Trip Blank Custody Seals Present	☐Yes ☐No ☐N/A	
Pace Trip Blank Lot # (if purchased): ____		

Client Notification/ Resolution: Field Data Required? Y / N

Person Contacted: _____ Date/Time: _____

Comments/ Resolution: _____

Project Manager Review: _____ **Date:** 6/20/11

Note: Whenever there is a discrepancy affecting North Carolina compliance samples, a copy of this form will be sent to the North Carolina DEHNR Certification Office (i.e out of hold, incorrect preservative, out of temp, incorrect containers)

Pace Analytical Services, Inc.
602 S 25th Street
Billings, MT 591014549
(406)254-7226

January 25, 2012

Kevin Houck
Herrera Environmental Consultants
101 East Broadway, Suite 610
Missoula, MT 59802

RE: Project: Black Pine Mine REV
Pace Project No.: 10163246

Dear Kevin Houck:
Enclosed are the analytical results for sample(s) received by the laboratory on July 13, 2011. The results relate only to the samples included in this report.

This report has been revised to add Cobalt and delete Silver.

If you have any questions concerning this report, please feel free to contact me.

Sincerely,

Sally Heinje

sally.heinje@pacelabs.com
Project Manager

Enclosures

cc: Devin Clary, Montana Dept. of Environmental Quality
Mark Donner, Trihydro
Jamie Mongoven, Montana Dept. of Environmental

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CERTIFICATIONS

Project: Black Pine Mine REV
Pace Project No.: 10163246

Minnesota Certification IDs

1700 Elm Street SE Suite 200, Minneapolis, MN 55414
A2LA Certification #: 2926.01
Alaska Certification #: UST-078
Alaska Certification #MN00064
Arizona Certification #: AZ-0014
Arkansas Certification #: 88-0680
California Certification #: 01155CA
EPA Region 8 Certification #: Pace
Florida/NELAP Certification #: E87605
Georgia Certification #: 959
Idaho Certification #: MN00064
Illinois Certification #: 200011
Iowa Certification #: 368
Kansas Certification #: E-10167
Louisiana Certification #: 03086
Louisiana Certification #: LA080009
Maine Certification #: 2007029
Maryland Certification #: 322
Michigan DEQ Certification #: 9909
Minnesota Certification #: 027-053-137
Mississippi Certification #: Pace
Montana Certification #: MT CERT0092
Nevada Certification #: MN_00064
Nebraska Certification #: Pace
New Jersey Certification #: MN-002
New Mexico Certification #: Pace
New York Certification #: 11647
North Carolina Certification #: 530
North Dakota Certification #: R-036
North Dakota Certification #: R-036A
Ohio VAP Certification #: CL101
Oklahoma Certification #: D9921
Oklahoma Certification #: 9507
Oregon Certification #: MN200001
Pennsylvania Certification #: 68-00563
Puerto Rico Certification
Tennessee Certification #: 02818
Texas Certification #: T104704192
Washington Certification #: C754
Wisconsin Certification #: 999407970

Montana Certification IDs

602 South 25th Street, Billings, MT 59101
EPA Region 8 Certification #: 8TMS-Q
Idaho Certification #: MT00012
Montana Certification #: MT CERT0040
NVLAP Certification #: 101292-0
Minnesota Dept of Health Certification #: 030-999-442

Kansas Certification IDs

9608 Loiret Boulevard, Lenexa, KS 66219
A2LA Certification #: 2456.01
Arkansas Certification #: 05-008-0
Illinois Certification #: 001191
Iowa Certification #: 118
Kansas/NELAP Certification #: E-10116
Louisiana Certification #: 03055
Nevada Certification #: KS000212008A
Oklahoma Certification #: 9205/9935
Texas Certification #: T104704407-08-TX
Utah Certification #: 9135995665

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SAMPLE SUMMARY

Project: Black Pine Mine REV
Pace Project No.: 10163246

Lab ID	Sample ID	Matrix	Date Collected	Date Received
10163246001	**BP-RY-SS-02-00**	Solid	07/12/11 08:50	07/13/11 09:00
10163246002	**BP-RY-SS-01-00**	Solid	07/12/11 09:18	07/13/11 09:00
10163246003	**BP-RY-SS-03-00**	Solid	07/12/11 10:25	07/13/11 09:00
10163246004	**BP-RY-SS-03-14**	Solid	07/12/11 10:28	07/13/11 09:00
10163246005	**BP-RY-SS-02-02**	Solid	07/12/11 08:55	07/13/11 09:00
10163246006	**BP-RY-SS-04-00**	Solid	07/12/11 11:28	07/13/11 09:00
10163246007	**BP-RY-SS-04-02**	Solid	07/12/11 11:30	07/13/11 09:00
10163246008	**BP-RY-SS-04-10**	Solid	07/12/11 11:33	07/13/11 09:00
10163246009	**BP-RY-SS-05-00**	Solid	07/12/11 12:28	07/13/11 09:00
10163246010	**BP-RY-SS-05-02**	Solid	07/12/11 12:30	07/13/11 09:00

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SAMPLE ANALYTE COUNT

Project: Black Pine Mine REV
Pace Project No.: 10163246

Lab ID	Sample ID	Method	Analysts	Analytes Reported	Laboratory
10163246001	**BP-RY-SS-02-00**	CLPICPAES	IP	1	PASI-M
		EPA 9081	SMW	1	PASI-K
		EPA 6020	CJS	12	PASI-M
		EPA 7471	TEM	1	PASI-M
		% Moisture	JDL	1	PASI-M
		ASA 33-3.2/EPA 353.2	CAC	1	PASI-MT
		ASTM D421	CAC	1	PASI-MT
		ASA 29-3.5.2	CAC	1	PASI-MT
		ASA 10-3.2	CAC	1	PASI-MT
		ASA 24-5.4/SM4500	SA1	1	PASI-MT
		Modified Sobek 3.2	JH1	1	PASI-MT
		Modified Sobek 3.2	JH1	5	PASI-MT
		Modified Sobek 3.2	JH1	4	PASI-MT
		Modified Sobek 3.2	JH1	1	PASI-MT
		ASA 10-3.3	SR1	1	PASI-MT
10163246002	**BP-RY-SS-01-00**	CLPICPAES	IP	1	PASI-M
		EPA 9081	SMW	1	PASI-K
		EPA 6020	CJS	12	PASI-M
		EPA 7471	TEM	1	PASI-M
		% Moisture	JDL	1	PASI-M
		ASA 33-3.2/EPA 353.2	CAC	1	PASI-MT
		ASTM D421	CAC	1	PASI-MT
		ASA 29-3.5.2	CAC	1	PASI-MT
		ASA 10-3.2	CAC	1	PASI-MT
		ASA 24-5.4/SM4500	SA1	1	PASI-MT
		Modified Sobek 3.2	JH1	1	PASI-MT
		Modified Sobek 3.2	JH1	5	PASI-MT
		Modified Sobek 3.2	JH1	4	PASI-MT
		Modified Sobek 3.2	JH1	1	PASI-MT
		ASA 10-3.3	SR1	1	PASI-MT
10163246003	**BP-RY-SS-03-00**	CLPICPAES	IP	1	PASI-M
		EPA 9081	SMW	1	PASI-K
		EPA 6020	CJS	12	PASI-M
		EPA 7471	TEM	1	PASI-M
		% Moisture	JDL	1	PASI-M
		ASA 33-3.2/EPA 353.2	CAC	1	PASI-MT
		ASTM D421	CAC	1	PASI-MT

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SAMPLE ANALYTE COUNT

Project: Black Pine Mine REV
Pace Project No.: 10163246

Lab ID	Sample ID	Method	Analysts	Analytes Reported	Laboratory
		ASA 29-3.5.2	CAC	1	PASI-MT
		ASA 10-3.2	CAC	1	PASI-MT
		ASA 24-5.4/SM4500	SA1	1	PASI-MT
		Modified Sobek 3.2	JH1	1	PASI-MT
		Modified Sobek 3.2	JH1	5	PASI-MT
		Modified Sobek 3.2	JH1	4	PASI-MT
		Modified Sobek 3.2	JH1	1	PASI-MT
		ASA 10-3.3	SR1	1	PASI-MT
10163246004	**BP-RY-SS-03-14**	CLPICPAES	IP	1	PASI-M
		EPA 9081	SMW	1	PASI-K
		EPA 6020	CJS	12	PASI-M
		EPA 7471	TEM	1	PASI-M
		% Moisture	JDL	1	PASI-M
		ASA 33-3.2/EPA 353.2	CAC	1	PASI-MT
		ASTM D421	CAC	1	PASI-MT
		ASA 29-3.5.2	CAC	1	PASI-MT
		ASA 10-3.2	CAC	1	PASI-MT
		ASA 24-5.4/SM4500	SA1	1	PASI-MT
		Modified Sobek 3.2	JH1	1	PASI-MT
		Modified Sobek 3.2	JH1	5	PASI-MT
		Modified Sobek 3.2	JH1	4	PASI-MT
		Modified Sobek 3.2	JH1	1	PASI-MT
		ASA 10-3.3	SR1	1	PASI-MT
10163246005	**BP-RY-SS-02-02**	CLPICPAES	IP	1	PASI-M
		EPA 9081	SMW	1	PASI-K
		EPA 6020	CJS	12	PASI-M
		EPA 7471	TEM	1	PASI-M
		% Moisture	JDL	1	PASI-M
		ASA 33-3.2/EPA 353.2	CAC	1	PASI-MT
		ASTM D421	CAC	1	PASI-MT
		ASA 29-3.5.2	CAC	1	PASI-MT
		ASA 10-3.2	CAC	1	PASI-MT
		ASA 24-5.4/SM4500	SA1	1	PASI-MT
		Modified Sobek 3.2	JH1	1	PASI-MT
		Modified Sobek 3.2	JH1	5	PASI-MT
		Modified Sobek 3.2	JH1	4	PASI-MT
		Modified Sobek 3.2	JH1	1	PASI-MT

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SAMPLE ANALYTE COUNT

Project: Black Pine Mine REV
Pace Project No.: 10163246

Lab ID	Sample ID	Method	Analysts	Analytes Reported	Laboratory
		ASA 10-3.3	SR1	1	PASI-MT
10163246006	**BP-RY-SS-04-00**	CLPICPAES	IP	1	PASI-M
		EPA 9081	SMW	1	PASI-K
		EPA 6020	CJS	12	PASI-M
		EPA 7471	TEM	1	PASI-M
		% Moisture	JDL	1	PASI-M
		ASA 33-3.2/EPA 353.2	CAC	1	PASI-MT
		ASTM D421	CAC	1	PASI-MT
		ASA 29-3.5.2	CAC	1	PASI-MT
		ASA 10-3.2	CAC	1	PASI-MT
		ASA 24-5.4/SM4500	SA1	1	PASI-MT
		Modified Sobek 3.2	JH1	1	PASI-MT
		Modified Sobek 3.2	JH1	5	PASI-MT
		Modified Sobek 3.2	JH1	4	PASI-MT
		Modified Sobek 3.2	JH1	1	PASI-MT
		ASA 10-3.3	SR1	1	PASI-MT
10163246007	**BP-RY-SS-04-02**	CLPICPAES	IP	1	PASI-M
		EPA 9081	SMW	1	PASI-K
		EPA 6020	CJS	12	PASI-M
		EPA 7471	TEM	1	PASI-M
		% Moisture	JDL	1	PASI-M
		ASA 33-3.2/EPA 353.2	CAC	1	PASI-MT
		ASTM D421	CAC	1	PASI-MT
		ASA 29-3.5.2	CAC	1	PASI-MT
		ASA 10-3.2	CAC	1	PASI-MT
		ASA 24-5.4/SM4500	SA1	1	PASI-MT
		Modified Sobek 3.2	JH1	1	PASI-MT
		Modified Sobek 3.2	JH1	5	PASI-MT
		Modified Sobek 3.2	JH1	4	PASI-MT
		Modified Sobek 3.2	JH1	1	PASI-MT
		ASA 10-3.3	SR1	1	PASI-MT
10163246008	**BP-RY-SS-04-10**	CLPICPAES	IP	1	PASI-M
		EPA 9081	SMW	1	PASI-K
		EPA 6020	CJS	12	PASI-M
		EPA 7471	TEM	1	PASI-M
		% Moisture	JDL	1	PASI-M
		ASA 33-3.2/EPA 353.2	CAC	1	PASI-MT

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SAMPLE ANALYTE COUNT

Project: Black Pine Mine REV
Pace Project No.: 10163246

Lab ID	Sample ID	Method	Analysts	Analytes Reported	Laboratory
		ASTM D421	CAC	1	PASI-MT
		ASA 29-3.5.2	CAC	1	PASI-MT
		ASA 10-3.2	CAC	1	PASI-MT
		ASA 24-5.4/SM4500	SA1	1	PASI-MT
		Modified Sobek 3.2	JH1	1	PASI-MT
		Modified Sobek 3.2	JH1	5	PASI-MT
		Modified Sobek 3.2	JH1	4	PASI-MT
		Modified Sobek 3.2	JH1	1	PASI-MT
		ASA 10-3.3	SR1	1	PASI-MT
10163246009	**BP-RY-SS-05-00**	CLPICPAES	IP	1	PASI-M
		EPA 9081	SMW	1	PASI-K
		EPA 6020	CJS	12	PASI-M
		EPA 7471	TEM	1	PASI-M
		% Moisture	JDL	1	PASI-M
		ASA 33-3.2/EPA 353.2	CAC	1	PASI-MT
		ASTM D421	CAC	1	PASI-MT
		ASA 29-3.5.2	CAC	1	PASI-MT
		ASA 10-3.2	CAC	1	PASI-MT
		ASA 24-5.4/SM4500	SA1	1	PASI-MT
		Modified Sobek 3.2	JH1	1	PASI-MT
		Modified Sobek 3.2	JH1	5	PASI-MT
		Modified Sobek 3.2	JH1	4	PASI-MT
		Modified Sobek 3.2	JH1	1	PASI-MT
		ASA 10-3.3	SR1	1	PASI-MT
10163246010	**BP-RY-SS-05-02**	CLPICPAES	IP	1	PASI-M
		EPA 9081	SMW	1	PASI-K
		EPA 6020	CJS	12	PASI-M
		EPA 7471	TEM	1	PASI-M
		% Moisture	JDL	1	PASI-M
		ASA 33-3.2/EPA 353.2	CAC	1	PASI-MT
		ASTM D421	CAC	1	PASI-MT
		ASA 29-3.5.2	CAC	1	PASI-MT
		ASA 10-3.2	CAC	1	PASI-MT
		ASA 24-5.4/SM4500	SA1	1	PASI-MT
		Modified Sobek 3.2	JH1	1	PASI-MT
		Modified Sobek 3.2	JH1	5	PASI-MT
		Modified Sobek 3.2	JH1	4	PASI-MT

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SAMPLE ANALYTE COUNT

Project: Black Pine Mine REV
Pace Project No.: 10163246

Lab ID	Sample ID	Method	Analysts	Analytes Reported	Laboratory
		Modified Sobek 3.2	JH1	1	PASI-MT
		ASA 10-3.3	SR1	1	PASI-MT

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PROJECT NARRATIVE

Project: Black Pine Mine REV
Pace Project No.: 10163246

Method: **CLPICPAES**
Description: 6010 MET ICP, MDEQ Potassium
Client: Montana Dept. of Environmental Quality
Date: January 25, 2012

General Information:
10 samples were analyzed for CLPICPAES. All samples were received in acceptable condition with any exceptions noted below.

Hold Time:
The samples were analyzed within the method required hold times with any exceptions noted below.

Sample Preparation:
The samples were prepared in accordance with ASA 13-3.5.2.2 with any exceptions noted below.

Initial Calibrations (including MS Tune as applicable):
All criteria were within method requirements with any exceptions noted below.

Continuing Calibration:
All criteria were within method requirements with any exceptions noted below.

Method Blank:
All analytes were below the report limit in the method blank with any exceptions noted below.

Laboratory Control Spike:
All laboratory control spike compounds were within QC limits with any exceptions noted below.

Matrix Spikes:
All percent recoveries and relative percent differences (RPDs) were within acceptance criteria with any exceptions noted below.

Duplicate Sample:
All duplicate sample results were within method acceptance criteria with any exceptions noted below.

Additional Comments:

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PROJECT NARRATIVE

Project: Black Pine Mine REV
Pace Project No.: 10163246

Method: **EPA 9081**
Description: Cation Exchange Capacity
Client: Montana Dept. of Environmental Quality
Date: January 25, 2012

General Information:
10 samples were analyzed for EPA 9081. All samples were received in acceptable condition with any exceptions noted below.

Hold Time:
The samples were analyzed within the method required hold times with any exceptions noted below.

Initial Calibrations (including MS Tune as applicable):
All criteria were within method requirements with any exceptions noted below.

Continuing Calibration:
All criteria were within method requirements with any exceptions noted below.

Method Blank:
All analytes were below the report limit in the method blank with any exceptions noted below.

Laboratory Control Spike:
All laboratory control spike compounds were within QC limits with any exceptions noted below.

Matrix Spikes:
All percent recoveries and relative percent differences (RPDs) were within acceptance criteria with any exceptions noted below.

Duplicate Sample:
All duplicate sample results were within method acceptance criteria with any exceptions noted below.

Additional Comments:

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PROJECT NARRATIVE

Project: Black Pine Mine REV
Pace Project No.: 10163246

Method: **EPA 6020**
Description: 6020 MET ICPMS
Client: Montana Dept. of Environmental Quality
Date: January 25, 2012

General Information:
10 samples were analyzed for EPA 6020. All samples were received in acceptable condition with any exceptions noted below.

Hold Time:
The samples were analyzed within the method required hold times with any exceptions noted below.

Sample Preparation:
The samples were prepared in accordance with EPA 3050 with any exceptions noted below.

Initial Calibrations (including MS Tune as applicable):
All criteria were within method requirements with any exceptions noted below.

Continuing Calibration:
All criteria were within method requirements with any exceptions noted below.

Internal Standards:
All internal standards were within QC limits with any exceptions noted below.

Method Blank:
All analytes were below the report limit in the method blank with any exceptions noted below.

QC Batch: MPRP/27163

P8: Analyte was detected in the method blank. All associated samples had concentrations of at least ten times greater than the blank or were below the reporting limit.

- BLANK (Lab ID: 1014833)
  - Lead

Laboratory Control Spike:
All laboratory control spike compounds were within QC limits with any exceptions noted below.

Matrix Spikes:
All percent recoveries and relative percent differences (RPDs) were within acceptance criteria with any exceptions noted below.

QC Batch: MPRP/27163

A matrix spike and matrix spike duplicate (MS/MSD) were performed on the following sample(s): 10163246001,10163606001

M6: Matrix spike and Matrix spike duplicate recovery not evaluated against control limits due to sample dilution.

- MS (Lab ID: 1014835)
  - Antimony
  - Barium
  - Iron
  - Manganese
  - Zinc
- MS (Lab ID: 1014837)
  - Arsenic

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PROJECT NARRATIVE

Project: Black Pine Mine REV
Pace Project No.: 10163246

Method: **EPA 6020**
Description: 6020 MET ICPMS
Client: Montana Dept. of Environmental Quality
Date: January 25, 2012

QC Batch: MPRP/27163

A matrix spike and matrix spike duplicate (MS/MSD) were performed on the following sample(s): 10163246001,10163606001

M6: Matrix spike and Matrix spike duplicate recovery not evaluated against control limits due to sample dilution.

- Barium
- Copper
- Iron
- Lead
- Manganese
- Zinc

- MSD (Lab ID: 1014836)
  - Antimony
  - Arsenic
  - Barium
  - Iron
  - Manganese
  - Zinc

Duplicate Sample:
All duplicate sample results were within method acceptance criteria with any exceptions noted below.

Additional Comments:

Analyte Comments:

QC Batch: MPRP/27163

E: Analyte concentration exceeded the calibration range. The reported result is estimated.

- MS (Lab ID: 1014835)
  - Manganese
- MSD (Lab ID: 1014836)
  - Manganese

P8: Analyte was detected in the method blank. All associated samples had concentrations of at least ten times greater than the blank or were below the reporting limit.

- BLANK (Lab ID: 1014833)
  - Lead

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PROJECT NARRATIVE

Project: Black Pine Mine REV
Pace Project No.: 10163246

Method: **EPA 7471**
Description: 7471 Mercury
Client: Montana Dept. of Environmental Quality
Date: January 25, 2012

General Information:
10 samples were analyzed for EPA 7471. All samples were received in acceptable condition with any exceptions noted below.

Hold Time:
The samples were analyzed within the method required hold times with any exceptions noted below.

Sample Preparation:
The samples were prepared in accordance with EPA 7471 with any exceptions noted below.

Initial Calibrations (including MS Tune as applicable):
All criteria were within method requirements with any exceptions noted below.

Continuing Calibration:
All criteria were within method requirements with any exceptions noted below.

Method Blank:
All analytes were below the report limit in the method blank with any exceptions noted below.

Laboratory Control Spike:
All laboratory control spike compounds were within QC limits with any exceptions noted below.

Matrix Spikes:
All percent recoveries and relative percent differences (RPDs) were within acceptance criteria with any exceptions noted below.

QC Batch: MERP/5632

A matrix spike and matrix spike duplicate (MS/MSD) were performed on the following sample(s): 10163246001,10163483010

M1: Matrix spike recovery exceeded QC limits. Batch accepted based on laboratory control sample (LCS) recovery.

- MS (Lab ID: 1014984)
  - Mercury
- MSD (Lab ID: 1014985)
  - Mercury

M6: Matrix spike and Matrix spike duplicate recovery not evaluated against control limits due to sample dilution.

- MS (Lab ID: 1014986)
  - Mercury

Duplicate Sample:
All duplicate sample results were within method acceptance criteria with any exceptions noted below.

Additional Comments:

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PROJECT NARRATIVE

Project: Black Pine Mine REV
Pace Project No.: 10163246

Method: **ASA 33-3.2/EPA 353.2**
Description: 353.2 Nitrate + Nitrite pres.
Client: Montana Dept. of Environmental Quality
Date: January 25, 2012

General Information:
10 samples were analyzed for ASA 33-3.2/EPA 353.2. All samples were received in acceptable condition with any exceptions noted below.

Hold Time:
The samples were analyzed within the method required hold times with any exceptions noted below.

Initial Calibrations (including MS Tune as applicable):
All criteria were within method requirements with any exceptions noted below.

Continuing Calibration:
All criteria were within method requirements with any exceptions noted below.

Internal Standards:
All internal standards were within QC limits with any exceptions noted below.

Surrogates:
All surrogates were within QC limits with any exceptions noted below.

Method Blank:
All analytes were below the report limit in the method blank with any exceptions noted below.

Laboratory Control Spike:
All laboratory control spike compounds were within QC limits with any exceptions noted below.

Matrix Spikes:
All percent recoveries and relative percent differences (RPDs) were within acceptance criteria with any exceptions noted below.

Duplicate Sample:
All duplicate sample results were within method acceptance criteria with any exceptions noted below.

Additional Comments:

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PROJECT NARRATIVE

Project: Black Pine Mine REV
Pace Project No.: 10163246

Method: **ASTM D421**
Description: Coarse
Client: Montana Dept. of Environmental Quality
Date: January 25, 2012

General Information:
10 samples were analyzed for ASTM D421. All samples were received in acceptable condition with any exceptions noted below.

Hold Time:
The samples were analyzed within the method required hold times with any exceptions noted below.

Initial Calibrations (including MS Tune as applicable):
All criteria were within method requirements with any exceptions noted below.

Continuing Calibration:
All criteria were within method requirements with any exceptions noted below.

Internal Standards:
All internal standards were within QC limits with any exceptions noted below.

Surrogates:
All surrogates were within QC limits with any exceptions noted below.

Method Blank:
All analytes were below the report limit in the method blank with any exceptions noted below.

Laboratory Control Spike:
All laboratory control spike compounds were within QC limits with any exceptions noted below.

Matrix Spikes:
All percent recoveries and relative percent differences (RPDs) were within acceptance criteria with any exceptions noted below.

Duplicate Sample:
All duplicate sample results were within method acceptance criteria with any exceptions noted below.

Additional Comments:

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PROJECT NARRATIVE

Project: Black Pine Mine REV
Pace Project No.: 10163246

Method: **ASA 29-3.5.2**
Description: Organic Matter MT ASA 29
Client: Montana Dept. of Environmental Quality
Date: January 25, 2012

General Information:
10 samples were analyzed for ASA 29-3.5.2. All samples were received in acceptable condition with any exceptions noted below.

Hold Time:
The samples were analyzed within the method required hold times with any exceptions noted below.

Initial Calibrations (including MS Tune as applicable):
All criteria were within method requirements with any exceptions noted below.

Continuing Calibration:
All criteria were within method requirements with any exceptions noted below.

Internal Standards:
All internal standards were within QC limits with any exceptions noted below.

Surrogates:
All surrogates were within QC limits with any exceptions noted below.

Method Blank:
All analytes were below the report limit in the method blank with any exceptions noted below.

Laboratory Control Spike:
All laboratory control spike compounds were within QC limits with any exceptions noted below.

Matrix Spikes:
All percent recoveries and relative percent differences (RPDs) were within acceptance criteria with any exceptions noted below.

Duplicate Sample:
All duplicate sample results were within method acceptance criteria with any exceptions noted below.

Additional Comments:

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PROJECT NARRATIVE

Project: Black Pine Mine REV
Pace Project No.: 10163246

Method: **ASA 10-3.2**
Description: ASA 10-3.2 pH
Client: Montana Dept. of Environmental Quality
Date: January 25, 2012

General Information:
10 samples were analyzed for ASA 10-3.2. All samples were received in acceptable condition with any exceptions noted below.

Hold Time:
The samples were analyzed within the method required hold times with any exceptions noted below.

Initial Calibrations (including MS Tune as applicable):
All criteria were within method requirements with any exceptions noted below.

Continuing Calibration:
All criteria were within method requirements with any exceptions noted below.

Internal Standards:
All internal standards were within QC limits with any exceptions noted below.

Surrogates:
All surrogates were within QC limits with any exceptions noted below.

Method Blank:
All analytes were below the report limit in the method blank with any exceptions noted below.

Laboratory Control Spike:
All laboratory control spike compounds were within QC limits with any exceptions noted below.

Matrix Spikes:
All percent recoveries and relative percent differences (RPDs) were within acceptance criteria with any exceptions noted below.

Duplicate Sample:
All duplicate sample results were within method acceptance criteria with any exceptions noted below.

Additional Comments:

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PROJECT NARRATIVE

Project: Black Pine Mine REV
Pace Project No.: 10163246

Method: **ASA 24-5.4/SM4500**
Description: SM4500P-E, Total Phosphorus
Client: Montana Dept. of Environmental Quality
Date: January 25, 2012

General Information:
10 samples were analyzed for ASA 24-5.4/SM4500. All samples were received in acceptable condition with any exceptions noted below.

Hold Time:
The samples were analyzed within the method required hold times with any exceptions noted below.

Initial Calibrations (including MS Tune as applicable):
All criteria were within method requirements with any exceptions noted below.

Continuing Calibration:
All criteria were within method requirements with any exceptions noted below.

Internal Standards:
All internal standards were within QC limits with any exceptions noted below.

Surrogates:
All surrogates were within QC limits with any exceptions noted below.

Method Blank:
All analytes were below the report limit in the method blank with any exceptions noted below.

Laboratory Control Spike:
All laboratory control spike compounds were within QC limits with any exceptions noted below.

Matrix Spikes:
All percent recoveries and relative percent differences (RPDs) were within acceptance criteria with any exceptions noted below.

Duplicate Sample:
All duplicate sample results were within method acceptance criteria with any exceptions noted below.

Additional Comments:

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PROJECT NARRATIVE

Project: Black Pine Mine REV
Pace Project No.: 10163246

Method: **Modified Sobek 3.2**
Description: Sobek Acid Base Potential
Client: Montana Dept. of Environmental Quality
Date: January 25, 2012

General Information:
10 samples were analyzed for Modified Sobek 3.2. All samples were received in acceptable condition with any exceptions noted below.

Hold Time:
The samples were analyzed within the method required hold times with any exceptions noted below.

Initial Calibrations (including MS Tune as applicable):
All criteria were within method requirements with any exceptions noted below.

Continuing Calibration:
All criteria were within method requirements with any exceptions noted below.

Internal Standards:
All internal standards were within QC limits with any exceptions noted below.

Surrogates:
All surrogates were within QC limits with any exceptions noted below.

Method Blank:
All analytes were below the report limit in the method blank with any exceptions noted below.

Laboratory Control Spike:
All laboratory control spike compounds were within QC limits with any exceptions noted below.

Matrix Spikes:
All percent recoveries and relative percent differences (RPDs) were within acceptance criteria with any exceptions noted below.

Duplicate Sample:
All duplicate sample results were within method acceptance criteria with any exceptions noted below.

Additional Comments:

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PROJECT NARRATIVE

Project: Black Pine Mine REV
Pace Project No.: 10163246

Method: **Modified Sobek 3.2**
Description: Sobek Extractable Sulfur
Client: Montana Dept. of Environmental Quality
Date: January 25, 2012

General Information:
10 samples were analyzed for Modified Sobek 3.2. All samples were received in acceptable condition with any exceptions noted below.

Hold Time:
The samples were analyzed within the method required hold times with any exceptions noted below.

Initial Calibrations (including MS Tune as applicable):
All criteria were within method requirements with any exceptions noted below.

Continuing Calibration:
All criteria were within method requirements with any exceptions noted below.

Internal Standards:
All internal standards were within QC limits with any exceptions noted below.

Surrogates:
All surrogates were within QC limits with any exceptions noted below.

Method Blank:
All analytes were below the report limit in the method blank with any exceptions noted below.

Laboratory Control Spike:
All laboratory control spike compounds were within QC limits with any exceptions noted below.

Matrix Spikes:
All percent recoveries and relative percent differences (RPDs) were within acceptance criteria with any exceptions noted below.

Duplicate Sample:
All duplicate sample results were within method acceptance criteria with any exceptions noted below.

Additional Comments:

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PROJECT NARRATIVE

Project: Black Pine Mine REV
Pace Project No.: 10163246

Method: **Modified Sobek 3.2**
Description: Sobek Calculations
Client: Montana Dept. of Environmental Quality
Date: January 25, 2012

General Information:
10 samples were analyzed for Modified Sobek 3.2. All samples were received in acceptable condition with any exceptions noted below.

Hold Time:
The samples were analyzed within the method required hold times with any exceptions noted below.

Initial Calibrations (including MS Tune as applicable):
All criteria were within method requirements with any exceptions noted below.

Continuing Calibration:
All criteria were within method requirements with any exceptions noted below.

Internal Standards:
All internal standards were within QC limits with any exceptions noted below.

Surrogates:
All surrogates were within QC limits with any exceptions noted below.

Method Blank:
All analytes were below the report limit in the method blank with any exceptions noted below.

Laboratory Control Spike:
All laboratory control spike compounds were within QC limits with any exceptions noted below.

Matrix Spikes:
All percent recoveries and relative percent differences (RPDs) were within acceptance criteria with any exceptions noted below.

Duplicate Sample:
All duplicate sample results were within method acceptance criteria with any exceptions noted below.

Additional Comments:

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PROJECT NARRATIVE

Project: Black Pine Mine REV
Pace Project No.: 10163246

Method: **Modified Sobek 3.2**
Description: Sobek SMP Buffer pH
Client: Montana Dept. of Environmental Quality
Date: January 25, 2012

General Information:
10 samples were analyzed for Modified Sobek 3.2. All samples were received in acceptable condition with any exceptions noted below.

Hold Time:
The samples were analyzed within the method required hold times with any exceptions noted below.

Initial Calibrations (including MS Tune as applicable):
All criteria were within method requirements with any exceptions noted below.

Continuing Calibration:
All criteria were within method requirements with any exceptions noted below.

Internal Standards:
All internal standards were within QC limits with any exceptions noted below.

Surrogates:
All surrogates were within QC limits with any exceptions noted below.

Method Blank:
All analytes were below the report limit in the method blank with any exceptions noted below.

Laboratory Control Spike:
All laboratory control spike compounds were within QC limits with any exceptions noted below.

Matrix Spikes:
All percent recoveries and relative percent differences (RPDs) were within acceptance criteria with any exceptions noted below.

Duplicate Sample:
All duplicate sample results were within method acceptance criteria with any exceptions noted below.

Additional Comments:

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PROJECT NARRATIVE

Project: Black Pine Mine REV
Pace Project No.: 10163246

Method: **ASA 10-3.3**
Description: ASA10-3.3 Specific Conductance
Client: Montana Dept. of Environmental Quality
Date: January 25, 2012

General Information:
10 samples were analyzed for ASA 10-3.3. All samples were received in acceptable condition with any exceptions noted below.

Hold Time:
The samples were analyzed within the method required hold times with any exceptions noted below.

Initial Calibrations (including MS Tune as applicable):
All criteria were within method requirements with any exceptions noted below.

Continuing Calibration:
All criteria were within method requirements with any exceptions noted below.

Internal Standards:
All internal standards were within QC limits with any exceptions noted below.

Surrogates:
All surrogates were within QC limits with any exceptions noted below.

Method Blank:
All analytes were below the report limit in the method blank with any exceptions noted below.

Laboratory Control Spike:
All laboratory control spike compounds were within QC limits with any exceptions noted below.

Matrix Spikes:
All percent recoveries and relative percent differences (RPDs) were within acceptance criteria with any exceptions noted below.

Duplicate Sample:
All duplicate sample results were within method acceptance criteria with any exceptions noted below.

QC Batch: MT/6547

D6: The relative percent difference (RPD) between the sample and sample duplicate exceeded laboratory control limits.

- DUP (Lab ID: 1022943)
  - Sp.Conductance Saturated Paste

Additional Comments:

This data package has been reviewed for quality and completeness and is approved for release.

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ANALYTICAL RESULTS

Project: Black Pine Mine REV
Pace Project No.: 10163246

Sample: BP-RY-SS-02-00 **Lab ID: 10163246001** Collected: 07/12/11 08:50 Received: 07/13/11 09:00 Matrix: Solid

Results reported on a "dry-weight" basis

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
6010 MET ICP, MDEQ Potassium	Analytical Method: CLPICPAES Preparation Method: ASA 13-3.5.2.2							
Potassium	**<568**	mg/kg	568	5	08/01/11 17:34	08/01/11 17:56	7440-09-7	
Cation Exchange Capacity	Analytical Method: EPA 9081							
Cation Exchange Capacity	**49.8**	meq/100g	1.0	10	07/27/11 15:00	07/29/11 12:37		
6020 MET ICPMS	Analytical Method: EPA 6020 Preparation Method: EPA 3050							
Antimony	**0.60**	mg/kg	0.45	20	07/25/11 09:38	07/31/11 15:18	7440-36-0	M6
Arsenic	**7.2**	mg/kg	0.45	20	07/25/11 09:38	07/31/11 15:18	7440-38-2	M6
Barium	**248**	mg/kg	0.27	20	07/25/11 09:38	07/31/11 15:18	7440-39-3	M6
Cadmium	**0.31**	mg/kg	0.073	20	07/25/11 09:38	07/31/11 15:18	7440-43-9	
Chromium	**4.4**	mg/kg	0.45	20	07/25/11 09:38	07/31/11 15:18	7440-47-3	
Cobalt	**3.3**	mg/kg	0.45	20	07/25/11 09:38	07/31/11 15:18	7440-48-4	
Copper	**5.7**	mg/kg	0.45	20	07/25/11 09:38	07/31/11 15:18	7440-50-8	
Iron	**6090**	mg/kg	45.4	20	07/25/11 09:38	07/31/11 15:18	7439-89-6	M6
Lead	**5.4**	mg/kg	0.091	20	07/25/11 09:38	07/31/11 15:18	7439-92-1	
Manganese	**782**	mg/kg	2.3	100	07/25/11 09:38	07/31/11 15:21	7439-96-5	M6
Nickel	**8.5**	mg/kg	0.45	20	07/25/11 09:38	07/31/11 15:18	7440-02-0	
Zinc	**42.7**	mg/kg	4.5	20	07/25/11 09:38	07/31/11 15:18	7440-66-6	M6
7471 Mercury	Analytical Method: EPA 7471 Preparation Method: EPA 7471							
Mercury	**0.14**	mg/kg	0.018	1	07/28/11 19:33	07/31/11 12:18	7439-97-6	M1
Dry Weight	Analytical Method: % Moisture							
Percent Moisture	**6.6**	%	0.10	1		07/20/11 00:00		
353.2 Nitrate + Nitrite pres.	Analytical Method: ASA 33-3.2/EPA 353.2							
Available Nitrate	**<5.0**	mg/kg	5.0	1		07/26/11 17:40		
Coarse	Analytical Method: ASTM D421							
Coarse Fragment	**50.4**	% (w/w)	0.10	1		07/26/11 12:15		
Organic Matter MT ASA 29	Analytical Method: ASA 29-3.5.2							
Organic Matter	**8.7**	% (w/w)	0.10	1		07/21/11 16:50		
ASA 10-3.2 pH	Analytical Method: ASA 10-3.2							
pH, Saturated Paste	**7.8**	Std. Units	0.10	1		07/27/11 17:26		
SM4500P-E, Total Phosphorus	Analytical Method: ASA 24-5.4/SM4500							
Available Phosphorus	**22.0**	mg/kg	2.0	2		07/25/11 14:31	7723-14-0	
Sobek Acid Base Potential	Analytical Method: Modified Sobek 3.2							
Neutralization Potential	**125**	tons/1000	0.50	1		07/29/11 00:00		

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ANALYTICAL RESULTS

Project: Black Pine Mine REV
Pace Project No.: 10163246

Sample: BP-RY-SS-02-00 **Lab ID: 10163246001** Collected: 07/12/11 08:50 Received: 07/13/11 09:00 Matrix: Solid

Results reported on a "dry-weight" basis

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
Sobek Extractable Sulfur	Analytical Method: Modified Sobek 3.2							
Sulfur, HCl Extractable	**<0.050**	% (w/w)	0.050	1		07/26/11 15:00		
Sulfur, HNO3 Extractable	**<0.050**	% (w/w)	0.050	1		07/26/11 15:00		
Sulfur, Hot Water Extractable	**<0.050**	% (w/w)	0.050	1		07/26/11 15:00		
Sulfur, Residual	**<0.050**	% (w/w)	0.050	1		07/26/11 15:00		
Total Sulfur	**<0.050**	% (w/w)	0.050	1		07/26/11 15:00		
Sobek Calculations	Analytical Method: Modified Sobek 3.2							
Acid/Base Potential	**124**	tons/1000		1		07/26/11 15:00		
Acid Potential	**<4.3**	tons/1000	4.3	1		07/26/11 15:00		
Lime Requirement	**<5.4**	tons/1000	5.4	1		07/26/11 15:00		
SMP Lime Requirement	**0**	tons/1000	0.0	1		07/26/11 15:00		
Sobek SMP Buffer pH	Analytical Method: Modified Sobek 3.2							
SMP Buffer pH	**7.0**	Std. Units	0.10	1		07/26/11 15:00		
ASA10-3.3 Specific Conductance	Analytical Method: ASA 10-3.3							
Sp.Conductance Saturated Paste	**0.33**	mmhos/cm	0.010	1		07/27/11 12:56		

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ANALYTICAL RESULTS

Project: Black Pine Mine REV
Pace Project No.: 10163246

Sample: BP-RY-SS-01-00 **Lab ID: 10163246002** Collected: 07/12/11 09:18 Received: 07/13/11 09:00 Matrix: Solid

Results reported on a "dry-weight" basis

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
6010 MET ICP, MDEQ Potassium	Analytical Method: CLPICPAES Preparation Method: ASA 13-3.5.2.2							
Potassium	**<277**	mg/kg	277	5	08/01/11 17:34	08/01/11 18:01	7440-09-7	
Cation Exchange Capacity	Analytical Method: EPA 9081							
Cation Exchange Capacity	**32.3**	meq/100g	0.99	10	07/27/11 15:00	07/29/11 12:44		
6020 MET ICPMS	Analytical Method: EPA 6020 Preparation Method: EPA 3050							
Antimony	**0.48**	mg/kg	0.37	20	07/25/11 09:38	07/31/11 15:25	7440-36-0	
Arsenic	**4.0**	mg/kg	0.37	20	07/25/11 09:38	07/31/11 15:25	7440-38-2	
Barium	**284**	mg/kg	0.22	20	07/25/11 09:38	07/31/11 15:25	7440-39-3	
Cadmium	**0.093**	mg/kg	0.060	20	07/25/11 09:38	07/31/11 15:25	7440-43-9	
Chromium	**6.8**	mg/kg	0.37	20	07/25/11 09:38	07/31/11 15:25	7440-47-3	
Cobalt	**4.3**	mg/kg	0.37	20	07/25/11 09:38	07/31/11 15:25	7440-48-4	
Copper	**5.1**	mg/kg	0.37	20	07/25/11 09:38	07/31/11 15:25	7440-50-8	
Iron	**11800**	mg/kg	37.4	20	07/25/11 09:38	07/31/11 15:25	7439-89-6	
Lead	**6.8**	mg/kg	0.075	20	07/25/11 09:38	07/31/11 15:25	7439-92-1	
Manganese	**327**	mg/kg	1.9	100	07/25/11 09:38	07/31/11 15:28	7439-96-5	
Nickel	**13.6**	mg/kg	0.37	20	07/25/11 09:38	07/31/11 15:25	7440-02-0	
Zinc	**36.8**	mg/kg	3.7	20	07/25/11 09:38	07/31/11 15:25	7440-66-6	
7471 Mercury	Analytical Method: EPA 7471 Preparation Method: EPA 7471							
Mercury	**0.025**	mg/kg	0.019	1	07/28/11 19:33	07/31/11 12:24	7439-97-6	
Dry Weight	Analytical Method: % Moisture							
Percent Moisture	**8.4**	%	0.10	1		07/21/11 00:00		
353.2 Nitrate + Nitrite pres.	Analytical Method: ASA 33-3.2/EPA 353.2							
Available Nitrate	**<5.0**	mg/kg	5.0	1		07/26/11 17:42		
Coarse	Analytical Method: ASTM D421							
Coarse Fragment	**67.1**	% (w/w)	0.10	1		07/26/11 12:15		
Organic Matter MT ASA 29	Analytical Method: ASA 29-3.5.2							
Organic Matter	**3.3**	% (w/w)	0.10	1		07/21/11 16:50		
ASA 10-3.2 pH	Analytical Method: ASA 10-3.2							
pH, Saturated Paste	**7.1**	Std. Units	0.10	1		07/27/11 17:26		
SM4500P-E, Total Phosphorus	Analytical Method: ASA 24-5.4/SM4500							
Available Phosphorus	**18.1**	mg/kg	2.0	2		07/25/11 14:33	7723-14-0	
Sobek Acid Base Potential	Analytical Method: Modified Sobek 3.2							
Neutralization Potential	**8.2**	tons/1000	0.50	1		07/29/11 00:00		

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ANALYTICAL RESULTS

Project: Black Pine Mine REV
Pace Project No.: 10163246

Sample: BP-RY-SS-01-00 **Lab ID: 10163246002** Collected: 07/12/11 09:18 Received: 07/13/11 09:00 Matrix: Solid

Results reported on a "dry-weight" basis

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
Sobek Extractable Sulfur	Analytical Method: Modified Sobek 3.2							
Sulfur, HCl Extractable	**<0.050**	% (w/w)	0.050	1		07/26/11 15:00		
Sulfur, HNO3 Extractable	**<0.050**	% (w/w)	0.050	1		07/26/11 15:00		
Sulfur, Hot Water Extractable	**<0.050**	% (w/w)	0.050	1		07/26/11 15:00		
Sulfur, Residual	**<0.050**	% (w/w)	0.050	1		07/26/11 15:00		
Total Sulfur	**<0.050**	% (w/w)	0.050	1		07/26/11 15:00		
Sobek Calculations	Analytical Method: Modified Sobek 3.2							
Acid/Base Potential	**8.2**	tons/1000		1		07/26/11 15:00		
Acid Potential	**<4.3**	tons/1000	4.3	1		07/26/11 15:00		
Lime Requirement	**6.3**	tons/1000	5.4	1		07/26/11 15:00		
SMP Lime Requirement	**4.6**	tons/1000	0.0	1		07/26/11 15:00		
Sobek SMP Buffer pH	Analytical Method: Modified Sobek 3.2							
SMP Buffer pH	**6.3**	Std. Units	0.10	1		07/26/11 15:00		
ASA10-3.3 Specific Conductance	Analytical Method: ASA 10-3.3							
Sp.Conductance Saturated Paste	**0.17**	mmhos/cm	0.010	1		07/27/11 12:56		

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ANALYTICAL RESULTS

Project: Black Pine Mine REV
Pace Project No.: 10163246

Sample: BP-RY-SS-03-00 **Lab ID: 10163246003** Collected: 07/12/11 10:25 Received: 07/13/11 09:00 Matrix: Solid

Results reported on a "dry-weight" basis

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
6010 MET ICP, MDEQ Potassium	Analytical Method: CLPICPAES Preparation Method: ASA 13-3.5.2.2							
Potassium	**<174**	mg/kg	174	5	08/01/11 17:34	08/01/11 18:05	7440-09-7	
Cation Exchange Capacity	Analytical Method: EPA 9081							
Cation Exchange Capacity	**14.1**	meq/100g	0.99	10	07/27/11 15:00	07/29/11 12:47		
6020 MET ICPMS	Analytical Method: EPA 6020 Preparation Method: EPA 3050							
Antimony	**2.4**	mg/kg	0.55	20	07/25/11 09:38	07/31/11 15:32	7440-36-0	
Arsenic	**8.4**	mg/kg	0.55	20	07/25/11 09:38	07/31/11 15:32	7440-38-2	
Barium	**202**	mg/kg	0.33	20	07/25/11 09:38	07/31/11 15:32	7440-39-3	
Cadmium	**0.14**	mg/kg	0.089	20	07/25/11 09:38	07/31/11 15:32	7440-43-9	
Chromium	**10.1**	mg/kg	0.55	20	07/25/11 09:38	07/31/11 15:32	7440-47-3	
Cobalt	**8.7**	mg/kg	0.55	20	07/25/11 09:38	07/31/11 15:32	7440-48-4	
Copper	**12.9**	mg/kg	0.55	20	07/25/11 09:38	07/31/11 15:32	7440-50-8	
Iron	**17900**	mg/kg	55.3	20	07/25/11 09:38	07/31/11 15:32	7439-89-6	
Lead	**20.4**	mg/kg	0.11	20	07/25/11 09:38	07/31/11 15:32	7439-92-1	
Manganese	**399**	mg/kg	0.55	20	07/25/11 09:38	07/31/11 15:32	7439-96-5	
Nickel	**12.0**	mg/kg	0.55	20	07/25/11 09:38	07/31/11 15:32	7440-02-0	
Zinc	**37.2**	mg/kg	5.5	20	07/25/11 09:38	07/31/11 15:32	7440-66-6	
7471 Mercury	Analytical Method: EPA 7471 Preparation Method: EPA 7471							
Mercury	**0.062**	mg/kg	0.018	1	07/28/11 19:33	07/31/11 12:26	7439-97-6	
Dry Weight	Analytical Method: % Moisture							
Percent Moisture	**10.5**	%	0.10	1		07/21/11 00:00		
353.2 Nitrate + Nitrite pres.	Analytical Method: ASA 33-3.2/EPA 353.2							
Available Nitrate	**<5.0**	mg/kg	5.0	1		07/26/11 17:43		
Coarse	Analytical Method: ASTM D421							
Coarse Fragment	**83.9**	% (w/w)	0.10	1		07/26/11 12:15		
Organic Matter MT ASA 29	Analytical Method: ASA 29-3.5.2							
Organic Matter	**0.35**	% (w/w)	0.10	1		07/21/11 16:50		
ASA 10-3.2 pH	Analytical Method: ASA 10-3.2							
pH, Saturated Paste	**7.0**	Std. Units	0.10	1		07/27/11 17:26		
SM4500P-E, Total Phosphorus	Analytical Method: ASA 24-5.4/SM4500							
Available Phosphorus	**7.1**	mg/kg	1.0	1		07/25/11 14:33	7723-14-0	
Sobek Acid Base Potential	Analytical Method: Modified Sobek 3.2							
Neutralization Potential	**6.5**	tons/1000	0.50	1		07/29/11 00:00		

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ANALYTICAL RESULTS

Project: Black Pine Mine REV
Pace Project No.: 10163246

Sample: BP-RY-SS-03-00 **Lab ID: 10163246003** Collected: 07/12/11 10:25 Received: 07/13/11 09:00 Matrix: Solid

Results reported on a "dry-weight" basis

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
Sobek Extractable Sulfur	Analytical Method: Modified Sobek 3.2							
Sulfur, HCl Extractable	**<0.050**	% (w/w)	0.050	1		07/26/11 15:00		
Sulfur, HNO3 Extractable	**<0.050**	% (w/w)	0.050	1		07/26/11 15:00		
Sulfur, Hot Water Extractable	**<0.050**	% (w/w)	0.050	1		07/26/11 15:00		
Sulfur, Residual	**<0.050**	% (w/w)	0.050	1		07/26/11 15:00		
Total Sulfur	**<0.050**	% (w/w)	0.050	1		07/26/11 15:00		
Sobek Calculations	Analytical Method: Modified Sobek 3.2							
Acid/Base Potential	**6.5**	tons/1000		1		07/26/11 15:00		
Acid Potential	**<4.3**	tons/1000	4.3	1		07/26/11 15:00		
Lime Requirement	**<5.4**	tons/1000	5.4	1		07/26/11 15:00		
SMP Lime Requirement	**0.3**	tons/1000	0.0	1		07/26/11 15:00		
Sobek SMP Buffer pH	Analytical Method: Modified Sobek 3.2							
SMP Buffer pH	**6.8**	Std. Units	0.10	1		07/26/11 15:00		
ASA10-3.3 Specific Conductance	Analytical Method: ASA 10-3.3							
Sp.Conductance Saturated Paste	**0.067**	mmhos/cm	0.010	1		07/27/11 12:56		

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ANALYTICAL RESULTS

Project: Black Pine Mine REV
Pace Project No.: 10163246

Sample: BP-RY-SS-03-14 **Lab ID: 10163246004** Collected: 07/12/11 10:28 Received: 07/13/11 09:00 Matrix: Solid

Results reported on a "dry-weight" basis

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
6010 MET ICP, MDEQ Potassium	Analytical Method: CLPICPAES Preparation Method: ASA 13-3.5.2.2							
Potassium	**158**	mg/kg	132	5	08/01/11 17:34	08/01/11 18:10	7440-09-7	
Cation Exchange Capacity	Analytical Method: EPA 9081							
Cation Exchange Capacity	**11.7**	meq/100g	1.0	10	07/27/11 15:00	07/29/11 12:50		
6020 MET ICPMS	Analytical Method: EPA 6020 Preparation Method: EPA 3050							
Antimony	**1.8**	mg/kg	0.38	20	07/25/11 09:38	07/31/11 16:04	7440-36-0	
Arsenic	**11.3**	mg/kg	0.38	20	07/25/11 09:38	07/31/11 16:04	7440-38-2	
Barium	**132**	mg/kg	0.23	20	07/25/11 09:38	07/31/11 16:04	7440-39-3	
Cadmium	**0.089**	mg/kg	0.061	20	07/25/11 09:38	07/31/11 16:04	7440-43-9	
Chromium	**5.1**	mg/kg	0.38	20	07/25/11 09:38	07/31/11 16:04	7440-47-3	
Cobalt	**4.7**	mg/kg	0.38	20	07/25/11 09:38	07/31/11 16:04	7440-48-4	
Copper	**7.6**	mg/kg	0.38	20	07/25/11 09:38	07/31/11 16:04	7440-50-8	
Iron	**13000**	mg/kg	38.2	20	07/25/11 09:38	07/31/11 16:04	7439-89-6	
Lead	**12.9**	mg/kg	0.076	20	07/25/11 09:38	07/31/11 16:04	7439-92-1	
Manganese	**153**	mg/kg	0.38	20	07/25/11 09:38	07/31/11 16:04	7439-96-5	
Nickel	**6.7**	mg/kg	0.38	20	07/25/11 09:38	07/31/11 16:04	7440-02-0	
Zinc	**15.9**	mg/kg	3.8	20	07/25/11 09:38	07/31/11 16:04	7440-66-6	
7471 Mercury	Analytical Method: EPA 7471 Preparation Method: EPA 7471							
Mercury	**0.069**	mg/kg	0.018	1	07/28/11 19:33	07/31/11 12:28	7439-97-6	
Dry Weight	Analytical Method: % Moisture							
Percent Moisture	**11.6**	%	0.10	1		07/21/11 00:00		
353.2 Nitrate + Nitrite pres.	Analytical Method: ASA 33-3.2/EPA 353.2							
Available Nitrate	**<5.0**	mg/kg	5.0	1		07/26/11 17:45		
Coarse	Analytical Method: ASTM D421							
Coarse Fragment	**22.3**	% (w/w)	0.10	1		07/26/11 12:15		
Organic Matter MT ASA 29	Analytical Method: ASA 29-3.5.2							
Organic Matter	**<0.10**	% (w/w)	0.10	1		07/21/11 16:50		
ASA 10-3.2 pH	Analytical Method: ASA 10-3.2							
pH, Saturated Paste	**7.0**	Std. Units	0.10	1		07/27/11 17:28		
SM4500P-E, Total Phosphorus	Analytical Method: ASA 24-5.4/SM4500							
Available Phosphorus	**2.8**	mg/kg	1.0	1		07/25/11 14:36	7723-14-0	
Sobek Acid Base Potential	Analytical Method: Modified Sobek 3.2							
Neutralization Potential	**3.7**	tons/1000	0.50	1		07/29/11 00:00		

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ANALYTICAL RESULTS

Project: Black Pine Mine REV
Pace Project No.: 10163246

Sample: BP-RY-SS-03-14 **Lab ID: 10163246004** Collected: 07/12/11 10:28 Received: 07/13/11 09:00 Matrix: Solid

Results reported on a "dry-weight" basis

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
Sobek Extractable Sulfur	Analytical Method: Modified Sobek 3.2							
Sulfur, HCl Extractable	**<0.050**	% (w/w)	0.050	1		07/26/11 15:00		
Sulfur, HNO3 Extractable	**<0.050**	% (w/w)	0.050	1		07/26/11 15:00		
Sulfur, Hot Water Extractable	**<0.050**	% (w/w)	0.050	1		07/26/11 15:00		
Sulfur, Residual	**<0.050**	% (w/w)	0.050	1		07/26/11 15:00		
Total Sulfur	**<0.050**	% (w/w)	0.050	1		07/26/11 15:00		
Sobek Calculations	Analytical Method: Modified Sobek 3.2							
Acid/Base Potential	**3.7**	tons/1000		1		07/26/11 15:00		
Acid Potential	**<3.7**	tons/1000	4.3	1		07/26/11 15:00		
Lime Requirement	**<5.4**	tons/1000	5.4	1		07/26/11 15:00		
SMP Lime Requirement	**0**	tons/1000	0.0	1		07/26/11 15:00		
Sobek SMP Buffer pH	Analytical Method: Modified Sobek 3.2							
SMP Buffer pH	**7.0**	Std. Units	0.10	1		07/26/11 15:00		
ASA10-3.3 Specific Conductance	Analytical Method: ASA 10-3.3							
Sp.Conductance Saturated Paste	**0.091**	mmhos/cm	0.010	1		07/27/11 12:56		

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ANALYTICAL RESULTS

Project: Black Pine Mine REV
Pace Project No.: 10163246

Sample: BP-RY-SS-02-02 **Lab ID: 10163246005** Collected: 07/12/11 08:55 Received: 07/13/11 09:00 Matrix: Solid

Results reported on a "dry-weight" basis

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
6010 MET ICP, MDEQ Potassium	Analytical Method: CLPICPAES Preparation Method: ASA 13-3.5.2.2							
Potassium	**<124**	mg/kg	124	5	08/01/11 17:34	08/01/11 18:14	7440-09-7	
Cation Exchange Capacity	Analytical Method: EPA 9081							
Cation Exchange Capacity	**35.5**	meq/100g	0.99	10	07/27/11 15:00	07/29/11 12:54		
6020 MET ICPMS	Analytical Method: EPA 6020 Preparation Method: EPA 3050							
Antimony	**0.50**	mg/kg	0.49	20	07/25/11 09:38	07/31/11 16:11	7440-36-0	
Arsenic	**7.8**	mg/kg	0.49	20	07/25/11 09:38	07/31/11 16:11	7440-38-2	
Barium	**239**	mg/kg	0.29	20	07/25/11 09:38	07/31/11 16:11	7440-39-3	
Cadmium	**<0.078**	mg/kg	0.078	20	07/25/11 09:38	07/31/11 16:11	7440-43-9	
Chromium	**12.9**	mg/kg	0.49	20	07/25/11 09:38	07/31/11 16:11	7440-47-3	
Cobalt	**5.1**	mg/kg	0.49	20	07/25/11 09:38	07/31/11 16:11	7440-48-4	
Copper	**8.9**	mg/kg	0.49	20	07/25/11 09:38	07/31/11 16:11	7440-50-8	
Iron	**20400**	mg/kg	48.7	20	07/25/11 09:38	07/31/11 16:11	7439-89-6	
Lead	**11.8**	mg/kg	0.097	20	07/25/11 09:38	07/31/11 16:11	7439-92-1	
Manganese	**192**	mg/kg	0.49	20	07/25/11 09:38	07/31/11 16:11	7439-96-5	
Nickel	**13.0**	mg/kg	0.49	20	07/25/11 09:38	07/31/11 16:11	7440-02-0	
Zinc	**36.9**	mg/kg	4.9	20	07/25/11 09:38	07/31/11 16:11	7440-66-6	
7471 Mercury	Analytical Method: EPA 7471 Preparation Method: EPA 7471							
Mercury	**<0.024**	mg/kg	0.024	1	07/28/11 19:33	07/31/11 12:30	7439-97-6	
Dry Weight	Analytical Method: % Moisture							
Percent Moisture	**21.6**	%	0.10	1		07/21/11 00:00		
353.2 Nitrate + Nitrite pres.	Analytical Method: ASA 33-3.2/EPA 353.2							
Available Nitrate	**<5.0**	mg/kg	5.0	1		07/26/11 17:54		
Coarse	Analytical Method: ASTM D421							
Coarse Fragment	**27.3**	% (w/w)	0.10	1		07/26/11 12:15		
Organic Matter MT ASA 29	Analytical Method: ASA 29-3.5.2							
Organic Matter	**3.4**	% (w/w)	0.10	1		07/21/11 16:50		
ASA 10-3.2 pH	Analytical Method: ASA 10-3.2							
pH, Saturated Paste	**7.0**	Std. Units	0.10	1		07/27/11 17:29		
SM4500P-E, Total Phosphorus	Analytical Method: ASA 24-5.4/SM4500							
Available Phosphorus	**14.7**	mg/kg	2.0	2		07/25/11 14:37	7723-14-0	
Sobek Acid Base Potential	Analytical Method: Modified Sobek 3.2							
Neutralization Potential	**6.2**	tons/1000	0.50	1		07/29/11 00:00		

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ANALYTICAL RESULTS

Project: Black Pine Mine REV
Pace Project No.: 10163246

Sample: BP-RY-SS-02-02 **Lab ID: 10163246005** Collected: 07/12/11 08:55 Received: 07/13/11 09:00 Matrix: Solid

Results reported on a "dry-weight" basis

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
Sobek Extractable Sulfur	Analytical Method: Modified Sobek 3.2							
Sulfur, HCl Extractable	**<0.050**	% (w/w)	0.050	1		07/26/11 15:00		
Sulfur, HNO3 Extractable	**<0.050**	% (w/w)	0.050	1		07/26/11 15:00		
Sulfur, Hot Water Extractable	**<0.050**	% (w/w)	0.050	1		07/26/11 15:00		
Sulfur, Residual	**<0.050**	% (w/w)	0.050	1		07/26/11 15:00		
Total Sulfur	**<0.050**	% (w/w)	0.050	1		07/26/11 15:00		
Sobek Calculations	Analytical Method: Modified Sobek 3.2							
Acid/Base Potential	**6.2**	tons/1000		1		07/26/11 15:00		
Acid Potential	**<4.3**	tons/1000	4.3	1		07/26/11 15:00		
Lime Requirement	**8.2**	tons/1000	5.4	1		07/26/11 15:00		
SMP Lime Requirement	**5.9**	tons/1000	0.0	1		07/26/11 15:00		
Sobek SMP Buffer pH	Analytical Method: Modified Sobek 3.2							
SMP Buffer pH	**5.8**	Std. Units	0.10	1		07/26/11 15:00		
ASA10-3.3 Specific Conductance	Analytical Method: ASA 10-3.3							
Sp.Conductance Saturated Paste	**0.12**	mmhos/cm	0.010	1		07/27/11 12:56		

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ANALYTICAL RESULTS

Project: Black Pine Mine REV
Pace Project No.: 10163246

Sample: BP-RY-SS-04-00 **Lab ID: 10163246006** Collected: 07/12/11 11:28 Received: 07/13/11 09:00 Matrix: Solid

Results reported on a "dry-weight" basis

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
6010 MET ICP, MDEQ Potassium	Analytical Method: CLPICPAES Preparation Method: ASA 13-3.5.2.2							
Potassium	**<180**	mg/kg	180	5	08/01/11 17:34	08/01/11 18:27	7440-09-7	
Cation Exchange Capacity	Analytical Method: EPA 9081							
Cation Exchange Capacity	**21.1**	meq/100g	0.99	10	07/27/11 15:00	07/29/11 12:57		
6020 MET ICPMS	Analytical Method: EPA 6020 Preparation Method: EPA 3050							
Antimony	**158**	mg/kg	0.54	20	07/25/11 09:38	07/31/11 16:18	7440-36-0	
Arsenic	**74.7**	mg/kg	0.54	20	07/25/11 09:38	07/31/11 16:18	7440-38-2	
Barium	**247**	mg/kg	0.33	20	07/25/11 09:38	07/31/11 16:18	7440-39-3	
Cadmium	**2.4**	mg/kg	0.087	20	07/25/11 09:38	07/31/11 16:18	7440-43-9	
Chromium	**3.4**	mg/kg	0.54	20	07/25/11 09:38	07/31/11 16:18	7440-47-3	
Cobalt	**4.0**	mg/kg	0.54	20	07/25/11 09:38	07/31/11 16:18	7440-48-4	
Copper	**82.5**	mg/kg	0.54	20	07/25/11 09:38	07/31/11 16:18	7440-50-8	
Iron	**16000**	mg/kg	54.3	20	07/25/11 09:38	07/31/11 16:18	7439-89-6	
Lead	**1030**	mg/kg	0.54	100	07/25/11 09:38	07/31/11 16:21	7439-92-1	
Manganese	**1300**	mg/kg	2.7	100	07/25/11 09:38	07/31/11 16:21	7439-96-5	
Nickel	**8.3**	mg/kg	0.54	20	07/25/11 09:38	07/31/11 16:18	7440-02-0	
Zinc	**141**	mg/kg	5.4	20	07/25/11 09:38	07/31/11 16:18	7440-66-6	
7471 Mercury	Analytical Method: EPA 7471 Preparation Method: EPA 7471							
Mercury	**<0.021**	mg/kg	0.021	1	07/28/11 19:33	07/31/11 12:32	7439-97-6	
Dry Weight	Analytical Method: % Moisture							
Percent Moisture	**14.7**	%	0.10	1		07/21/11 00:00		
353.2 Nitrate + Nitrite pres.	Analytical Method: ASA 33-3.2/EPA 353.2							
Available Nitrate	**<5.0**	mg/kg	5.0	1		07/26/11 17:56		
Coarse	Analytical Method: ASTM D421							
Coarse Fragment	**54.6**	% (w/w)	0.10	1		07/26/11 12:15		
Organic Matter MT ASA 29	Analytical Method: ASA 29-3.5.2							
Organic Matter	**3.1**	% (w/w)	0.10	1		07/22/11 11:05		
ASA 10-3.2 pH	Analytical Method: ASA 10-3.2							
pH, Saturated Paste	**7.0**	Std. Units	0.10	1		07/27/11 17:30		
SM4500P-E, Total Phosphorus	Analytical Method: ASA 24-5.4/SM4500							
Available Phosphorus	**5.3**	mg/kg	2.0	2		07/25/11 14:38	7723-14-0	
Sobek Acid Base Potential	Analytical Method: Modified Sobek 3.2							
Neutralization Potential	**7.0**	tons/1000	0.50	1		07/29/11 00:00		

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ANALYTICAL RESULTS

Project: Black Pine Mine REV
Pace Project No.: 10163246

Sample: BP-RY-SS-04-00 **Lab ID: 10163246006** Collected: 07/12/11 11:28 Received: 07/13/11 09:00 Matrix: Solid

Results reported on a "dry-weight" basis

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
Sobek Extractable Sulfur	Analytical Method: Modified Sobek 3.2							
Sulfur, HCl Extractable	**<0.050**	% (w/w)	0.050	1		07/26/11 15:00		
Sulfur, HNO3 Extractable	**<0.050**	% (w/w)	0.050	1		07/26/11 15:00		
Sulfur, Hot Water Extractable	**<0.050**	% (w/w)	0.050	1		07/26/11 15:00		
Sulfur, Residual	**<0.050**	% (w/w)	0.050	1		07/26/11 15:00		
Total Sulfur	**<0.050**	% (w/w)	0.050	1		07/26/11 15:00		
Sobek Calculations	Analytical Method: Modified Sobek 3.2							
Acid/Base Potential	**7.0**	tons/1000		1		07/26/11 15:00		
Acid Potential	**<4.3**	tons/1000	4.3	1		07/26/11 15:00		
Lime Requirement	**7.0**	tons/1000	5.4	1		07/26/11 15:00		
SMP Lime Requirement	**5.3**	tons/1000	0.0	1		07/26/11 15:00		
Sobek SMP Buffer pH	Analytical Method: Modified Sobek 3.2							
SMP Buffer pH	**6.2**	Std. Units	0.10	1		07/26/11 15:00		
ASA10-3.3 Specific Conductance	Analytical Method: ASA 10-3.3							
Sp.Conductance Saturated Paste	**0.14**	mmhos/cm	0.010	1		07/27/11 12:56		

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ANALYTICAL RESULTS

Project: Black Pine Mine REV
Pace Project No.: 10163246

Sample: BP-RY-SS-04-02 **Lab ID: 10163246007** Collected: 07/12/11 11:30 Received: 07/13/11 09:00 Matrix: Solid

Results reported on a "dry-weight" basis

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
6010 MET ICP, MDEQ Potassium	Analytical Method: CLPICPAES Preparation Method: ASA 13-3.5.2.2							
Potassium	**<334**	mg/kg	334	5	08/01/11 17:34	08/01/11 18:31	7440-09-7	
Cation Exchange Capacity	Analytical Method: EPA 9081							
Cation Exchange Capacity	**13.5**	meq/100g	1.0	10	07/27/11 15:00	07/29/11 13:00		
6020 MET ICPMS	Analytical Method: EPA 6020 Preparation Method: EPA 3050							
Antimony	**68.3**	mg/kg	0.42	20	07/25/11 09:38	07/31/11 16:25	7440-36-0	
Arsenic	**78.6**	mg/kg	0.42	20	07/25/11 09:38	07/31/11 16:25	7440-38-2	
Barium	**161**	mg/kg	0.25	20	07/25/11 09:38	07/31/11 16:25	7440-39-3	
Cadmium	**1.4**	mg/kg	0.067	20	07/25/11 09:38	07/31/11 16:25	7440-43-9	
Chromium	**2.2**	mg/kg	0.42	20	07/25/11 09:38	07/31/11 16:25	7440-47-3	
Cobalt	**9.7**	mg/kg	0.42	20	07/25/11 09:38	07/31/11 16:25	7440-48-4	
Copper	**209**	mg/kg	0.42	20	07/25/11 09:38	07/31/11 16:25	7440-50-8	
Iron	**17400**	mg/kg	41.9	20	07/25/11 09:38	07/31/11 16:25	7439-89-6	
Lead	**751**	mg/kg	0.42	100	07/25/11 09:38	07/31/11 16:28	7439-92-1	
Manganese	**992**	mg/kg	2.1	100	07/25/11 09:38	07/31/11 16:28	7439-96-5	
Nickel	**7.1**	mg/kg	0.42	20	07/25/11 09:38	07/31/11 16:25	7440-02-0	
Zinc	**134**	mg/kg	4.2	20	07/25/11 09:38	07/31/11 16:25	7440-66-6	
7471 Mercury	Analytical Method: EPA 7471 Preparation Method: EPA 7471							
Mercury	**0.33**	mg/kg	0.021	1	07/28/11 19:33	07/31/11 12:44	7439-97-6	
Dry Weight	Analytical Method: % Moisture							
Percent Moisture	**9.5**	%	0.10	1		07/21/11 00:00		
353.2 Nitrate + Nitrite pres.	Analytical Method: ASA 33-3.2/EPA 353.2							
Available Nitrate	**<5.0**	mg/kg	5.0	1		07/26/11 17:58		
Coarse	Analytical Method: ASTM D421							
Coarse Fragment	**33.1**	% (w/w)	0.10	1		07/26/11 12:15		
Organic Matter MT ASA 29	Analytical Method: ASA 29-3.5.2							
Organic Matter	**0.15**	% (w/w)	0.10	1		07/21/11 16:50		
ASA 10-3.2 pH	Analytical Method: ASA 10-3.2							
pH, Saturated Paste	**5.8**	Std. Units	0.10	1		07/27/11 17:30		
SM4500P-E, Total Phosphorus	Analytical Method: ASA 24-5.4/SM4500							
Available Phosphorus	**3.2**	mg/kg	1.0	1		07/25/11 14:39	7723-14-0	
Sobek Acid Base Potential	Analytical Method: Modified Sobek 3.2							
Neutralization Potential	**4.0**	tons/1000	0.50	1		07/29/11 00:00		

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ANALYTICAL RESULTS

Project: Black Pine Mine REV
Pace Project No.: 10163246

Sample: BP-RY-SS-04-02 **Lab ID: 10163246007** Collected: 07/12/11 11:30 Received: 07/13/11 09:00 Matrix: Solid

Results reported on a "dry-weight" basis

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
Sobek Extractable Sulfur	Analytical Method: Modified Sobek 3.2							
Sulfur, HCl Extractable	**<0.050**	% (w/w)	0.050	1		07/26/11 15:00		
Sulfur, HNO3 Extractable	**<0.050**	% (w/w)	0.050	1		07/26/11 15:00		
Sulfur, Hot Water Extractable	**<0.050**	% (w/w)	0.050	1		07/26/11 15:00		
Sulfur, Residual	**<0.050**	% (w/w)	0.050	1		07/26/11 15:00		
Total Sulfur	**<0.050**	% (w/w)	0.050	1		07/26/11 15:00		
Sobek Calculations	Analytical Method: Modified Sobek 3.2							
Acid/Base Potential	**4.0**	tons/1000		1		07/26/11 15:00		
Acid Potential	**<4.3**	tons/1000	4.3	1		07/26/11 15:00		
Lime Requirement	**<5.4**	tons/1000	5.4	1		07/26/11 15:00		
SMP Lime Requirement	**1**	tons/1000	0.0	1		07/26/11 15:00		
Sobek SMP Buffer pH	Analytical Method: Modified Sobek 3.2							
SMP Buffer pH	**6.8**	Std. Units	0.10	1		07/26/11 15:00		
ASA10-3.3 Specific Conductance	Analytical Method: ASA 10-3.3							
Sp.Conductance Saturated Paste	**0.10**	mmhos/cm	0.010	1		07/27/11 12:56		

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ANALYTICAL RESULTS

Project: Black Pine Mine REV
Pace Project No.: 10163246

Sample: BP-RY-SS-04-10 **Lab ID: 10163246008** Collected: 07/12/11 11:33 Received: 07/13/11 09:00 Matrix: Solid

Results reported on a "dry-weight" basis

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
6010 MET ICP, MDEQ Potassium	Analytical Method: CLPICPAES Preparation Method: ASA 13-3.5.2.2							
Potassium	**160**	mg/kg	119	5	08/01/11 17:34	08/01/11 18:36	7440-09-7	
Cation Exchange Capacity	Analytical Method: EPA 9081							
Cation Exchange Capacity	**12.2**	meq/100g	0.99	10	07/27/11 15:00	07/29/11 13:04		
6020 MET ICPMS	Analytical Method: EPA 6020 Preparation Method: EPA 3050							
Antimony	**36.7**	mg/kg	0.48	20	07/25/11 09:38	07/31/11 16:32	7440-36-0	
Arsenic	**33.2**	mg/kg	0.48	20	07/25/11 09:38	07/31/11 16:32	7440-38-2	
Barium	**96.4**	mg/kg	0.29	20	07/25/11 09:38	07/31/11 16:32	7440-39-3	
Cadmium	**0.72**	mg/kg	0.076	20	07/25/11 09:38	07/31/11 16:32	7440-43-9	
Chromium	**5.2**	mg/kg	0.48	20	07/25/11 09:38	07/31/11 16:32	7440-47-3	
Cobalt	**6.8**	mg/kg	0.48	20	07/25/11 09:38	07/31/11 16:32	7440-48-4	
Copper	**123**	mg/kg	0.48	20	07/25/11 09:38	07/31/11 16:32	7440-50-8	
Iron	**12600**	mg/kg	47.6	20	07/25/11 09:38	07/31/11 16:32	7439-89-6	
Lead	**256**	mg/kg	0.095	20	07/25/11 09:38	07/31/11 16:32	7439-92-1	
Manganese	**362**	mg/kg	0.48	20	07/25/11 09:38	07/31/11 16:32	7439-96-5	
Nickel	**10.8**	mg/kg	0.48	20	07/25/11 09:38	07/31/11 16:32	7440-02-0	
Zinc	**104**	mg/kg	4.8	20	07/25/11 09:38	07/31/11 16:32	7440-66-6	
7471 Mercury	Analytical Method: EPA 7471 Preparation Method: EPA 7471							
Mercury	**0.18**	mg/kg	0.021	1	07/28/11 19:33	07/31/11 12:46	7439-97-6	
Dry Weight	Analytical Method: % Moisture							
Percent Moisture	**7.0**	%	0.10	1		07/21/11 00:00		
353.2 Nitrate + Nitrite pres.	Analytical Method: ASA 33-3.2/EPA 353.2							
Available Nitrate	**<5.0**	mg/kg	5.0	1		07/26/11 17:59		
Coarse	Analytical Method: ASTM D421							
Coarse Fragment	**25.1**	% (w/w)	0.10	1		07/26/11 12:15		
Organic Matter MT ASA 29	Analytical Method: ASA 29-3.5.2							
Organic Matter	**0.12**	% (w/w)	0.10	1		07/21/11 16:50		
ASA 10-3.2 pH	Analytical Method: ASA 10-3.2							
pH, Saturated Paste	**6.9**	Std. Units	0.10	1		07/27/11 17:31		
SM4500P-E, Total Phosphorus	Analytical Method: ASA 24-5.4/SM4500							
Available Phosphorus	**4.5**	mg/kg	2.0	2		07/25/11 14:41	7723-14-0	
Sobek Acid Base Potential	Analytical Method: Modified Sobek 3.2							
Neutralization Potential	**3.0**	tons/1000	0.50	1		07/29/11 00:00		

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ANALYTICAL RESULTS

Project: Black Pine Mine REV
Pace Project No.: 10163246

Sample: BP-RY-SS-04-10 **Lab ID: 10163246008** Collected: 07/12/11 11:33 Received: 07/13/11 09:00 Matrix: Solid

Results reported on a "dry-weight" basis

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
Sobek Extractable Sulfur	Analytical Method: Modified Sobek 3.2							
Sulfur, HCl Extractable	**<0.050**	% (w/w)	0.050	1		07/26/11 15:00		
Sulfur, HNO3 Extractable	**<0.050**	% (w/w)	0.050	1		07/26/11 15:00		
Sulfur, Hot Water Extractable	**<0.050**	% (w/w)	0.050	1		07/26/11 15:00		
Sulfur, Residual	**<0.050**	% (w/w)	0.050	1		07/26/11 15:00		
Total Sulfur	**<0.050**	% (w/w)	0.050	1		07/26/11 15:00		
Sobek Calculations	Analytical Method: Modified Sobek 3.2							
Acid/Base Potential	**3.0**	tons/1000		1		07/26/11 15:00		
Acid Potential	**<4.3**	tons/1000	4.3	1		07/26/11 15:00		
Lime Requirement	**<5.4**	tons/1000	5.4	1		07/26/11 15:00		
SMP Lime Requirement	**0**	tons/1000	0.0	1		07/26/11 15:00		
Sobek SMP Buffer pH	Analytical Method: Modified Sobek 3.2							
SMP Buffer pH	**7.0**	Std. Units	0.10	1		07/26/11 15:00		
ASA10-3.3 Specific Conductance	Analytical Method: ASA 10-3.3							
Sp.Conductance Saturated Paste	**0.12**	mmhos/cm	0.010	1		07/27/11 12:56		

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ANALYTICAL RESULTS

Project: Black Pine Mine REV
Pace Project No.: 10163246

Sample: BP-RY-SS-05-00 **Lab ID: 10163246009** Collected: 07/12/11 12:28 Received: 07/13/11 09:00 Matrix: Solid

Results reported on a "dry-weight" basis

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
6010 MET ICP, MDEQ Potassium	Analytical Method: CLPICPAES Preparation Method: ASA 13-3.5.2.2							
Potassium	**294**	mg/kg	152	5	08/01/11 17:34	08/01/11 18:40	7440-09-7	
Cation Exchange Capacity	Analytical Method: EPA 9081							
Cation Exchange Capacity	**34.2**	meq/100g	0.99	10	07/27/11 15:00	07/29/11 13:13		
6020 MET ICPMS	Analytical Method: EPA 6020 Preparation Method: EPA 3050							
Antimony	**2.0**	mg/kg	0.49	20	07/25/11 09:38	07/31/11 16:53	7440-36-0	
Arsenic	**11.1**	mg/kg	0.49	20	07/25/11 09:38	07/31/11 16:53	7440-38-2	
Barium	**285**	mg/kg	0.30	20	07/25/11 09:38	07/31/11 16:53	7440-39-3	
Cadmium	**1.0**	mg/kg	0.079	20	07/25/11 09:38	07/31/11 16:53	7440-43-9	
Chromium	**6.2**	mg/kg	0.49	20	07/25/11 09:38	07/31/11 16:53	7440-47-3	
Cobalt	**5.1**	mg/kg	0.49	20	07/25/11 09:38	07/31/11 16:53	7440-48-4	
Copper	**12.6**	mg/kg	0.49	20	07/25/11 09:38	07/31/11 16:53	7440-50-8	
Iron	**11800**	mg/kg	49.3	20	07/25/11 09:38	07/31/11 16:53	7439-89-6	
Lead	**27.9**	mg/kg	0.099	20	07/25/11 09:38	07/31/11 16:53	7439-92-1	
Manganese	**1040**	mg/kg	2.5	100	07/25/11 09:38	07/31/11 16:56	7439-96-5	
Nickel	**12.2**	mg/kg	0.49	20	07/25/11 09:38	07/31/11 16:53	7440-02-0	
Zinc	**85.3**	mg/kg	4.9	20	07/25/11 09:38	07/31/11 16:53	7440-66-6	
7471 Mercury	Analytical Method: EPA 7471 Preparation Method: EPA 7471							
Mercury	**<0.019**	mg/kg	0.019	1	07/28/11 19:33	07/31/11 12:48	7439-97-6	
Dry Weight	Analytical Method: % Moisture							
Percent Moisture	**5.3**	%	0.10	1		07/21/11 00:00		
353.2 Nitrate + Nitrite pres.	Analytical Method: ASA 33-3.2/EPA 353.2							
Available Nitrate	**<5.0**	mg/kg	5.0	1		07/26/11 18:01		
Coarse	Analytical Method: ASTM D421							
Coarse Fragment	**54.7**	% (w/w)	0.10	1		07/26/11 12:15		
Organic Matter MT ASA 29	Analytical Method: ASA 29-3.5.2							
Organic Matter	**5.6**	% (w/w)	0.10	1		07/21/11 16:50		
ASA 10-3.2 pH	Analytical Method: ASA 10-3.2							
pH, Saturated Paste	**7.3**	Std. Units	0.10	1		07/27/11 17:32		
SM4500P-E, Total Phosphorus	Analytical Method: ASA 24-5.4/SM4500							
Available Phosphorus	**10.2**	mg/kg	2.0	2		07/25/11 14:42	7723-14-0	
Sobek Acid Base Potential	Analytical Method: Modified Sobek 3.2							
Neutralization Potential	**7.0**	tons/1000	0.50	1		07/29/11 00:00		

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ANALYTICAL RESULTS

Project: Black Pine Mine REV
Pace Project No.: 10163246

Sample: BP-RY-SS-05-00 **Lab ID: 10163246009** Collected: 07/12/11 12:28 Received: 07/13/11 09:00 Matrix: Solid

Results reported on a "dry-weight" basis

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
Sobek Extractable Sulfur	Analytical Method: Modified Sobek 3.2							
Sulfur, HCl Extractable	**<0.050**	% (w/w)	0.050	1		07/26/11 15:00		
Sulfur, HNO3 Extractable	**<0.050**	% (w/w)	0.050	1		07/26/11 15:00		
Sulfur, Hot Water Extractable	**<0.050**	% (w/w)	0.050	1		07/26/11 15:00		
Sulfur, Residual	**<0.050**	% (w/w)	0.050	1		07/26/11 15:00		
Total Sulfur	**<0.050**	% (w/w)	0.050	1		07/26/11 15:00		
Sobek Calculations	Analytical Method: Modified Sobek 3.2							
Acid/Base Potential	**7.0**	tons/1000		1		07/26/11 15:00		
Acid Potential	**<4.3**	tons/1000	4.3	1		07/26/11 15:00		
Lime Requirement	**8.6**	tons/1000	5.4	1		07/26/11 15:00		
SMP Lime Requirement	**6.1**	tons/1000	0.0	1		07/26/11 15:00		
Sobek SMP Buffer pH	Analytical Method: Modified Sobek 3.2							
SMP Buffer pH	**6.1**	Std. Units	0.10	1		07/26/11 15:00		
ASA10-3.3 Specific Conductance	Analytical Method: ASA 10-3.3							
Sp.Conductance Saturated Paste	**0.19**	mmhos/cm	0.010	1		07/27/11 12:56		

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ANALYTICAL RESULTS

Project: Black Pine Mine REV
Pace Project No.: 10163246

Sample: BP-RY-SS-05-02 **Lab ID: 10163246010** Collected: 07/12/11 12:30 Received: 07/13/11 09:00 Matrix: Solid

Results reported on a "dry-weight" basis

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
6010 MET ICP, MDEQ Potassium	Analytical Method: CLPICPAES Preparation Method: ASA 13-3.5.2.2							
Potassium	**<118**	mg/kg	118	5	08/01/11 17:34	08/01/11 18:45	7440-09-7	
Cation Exchange Capacity	Analytical Method: EPA 9081							
Cation Exchange Capacity	**13.8**	meq/100g	0.98	10	07/27/11 15:00	07/29/11 13:16		
6020 MET ICPMS	Analytical Method: EPA 6020 Preparation Method: EPA 3050							
Antimony	**0.89**	mg/kg	0.47	20	07/25/11 09:38	07/31/11 17:00	7440-36-0	
Arsenic	**6.8**	mg/kg	0.47	20	07/25/11 09:38	07/31/11 17:00	7440-38-2	
Barium	**116**	mg/kg	0.28	20	07/25/11 09:38	07/31/11 17:00	7440-39-3	
Cadmium	**0.23**	mg/kg	0.076	20	07/25/11 09:38	07/31/11 17:00	7440-43-9	
Chromium	**10.1**	mg/kg	0.47	20	07/25/11 09:38	07/31/11 17:00	7440-47-3	
Cobalt	**4.8**	mg/kg	0.47	20	07/25/11 09:38	07/31/11 17:00	7440-48-4	
Copper	**7.5**	mg/kg	0.47	20	07/25/11 09:38	07/31/11 17:00	7440-50-8	
Iron	**13000**	mg/kg	47.3	20	07/25/11 09:38	07/31/11 17:00	7439-89-6	
Lead	**15.3**	mg/kg	0.095	20	07/25/11 09:38	07/31/11 17:00	7439-92-1	
Manganese	**223**	mg/kg	0.47	20	07/25/11 09:38	07/31/11 17:00	7439-96-5	
Nickel	**11.2**	mg/kg	0.47	20	07/25/11 09:38	07/31/11 17:00	7440-02-0	
Zinc	**49.9**	mg/kg	4.7	20	07/25/11 09:38	07/31/11 17:00	7440-66-6	
7471 Mercury	Analytical Method: EPA 7471 Preparation Method: EPA 7471							
Mercury	**<0.022**	mg/kg	0.022	1	07/28/11 19:33	07/31/11 12:50	7439-97-6	
Dry Weight	Analytical Method: % Moisture							
Percent Moisture	**10.5**	%	0.10	1		07/21/11 00:00		
353.2 Nitrate + Nitrite pres.	Analytical Method: ASA 33-3.2/EPA 353.2							
Available Nitrate	**<5.0**	mg/kg	5.0	1		07/26/11 18:02		
Coarse	Analytical Method: ASTM D421							
Coarse Fragment	**35.0**	% (w/w)	0.10	1		07/26/11 12:15		
Organic Matter MT ASA 29	Analytical Method: ASA 29-3.5.2							
Organic Matter	**0.80**	% (w/w)	0.10	1		07/21/11 16:50		
ASA 10-3.2 pH	Analytical Method: ASA 10-3.2							
pH, Saturated Paste	**7.1**	Std. Units	0.10	1		07/27/11 17:34		
SM4500P-E, Total Phosphorus	Analytical Method: ASA 24-5.4/SM4500							
Available Phosphorus	**1.1**	mg/kg	1.0	1		07/25/11 14:43	7723-14-0	
Sobek Acid Base Potential	Analytical Method: Modified Sobek 3.2							
Neutralization Potential	**4.3**	tons/1000	0.50	1		07/29/11 00:00		

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ANALYTICAL RESULTS

Project: Black Pine Mine REV
Pace Project No.: 10163246

Sample: BP-RY-SS-05-02 **Lab ID: 10163246010** Collected: 07/12/11 12:30 Received: 07/13/11 09:00 Matrix: Solid

Results reported on a "dry-weight" basis

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
Sobek Extractable Sulfur	Analytical Method: Modified Sobek 3.2							
Sulfur, HCl Extractable	**<0.050**	% (w/w)	0.050	1		07/26/11 15:00		
Sulfur, HNO3 Extractable	**<0.050**	% (w/w)	0.050	1		07/26/11 15:00		
Sulfur, Hot Water Extractable	**<0.050**	% (w/w)	0.050	1		07/26/11 15:00		
Sulfur, Residual	**<0.050**	% (w/w)	0.050	1		07/26/11 15:00		
Total Sulfur	**<0.050**	% (w/w)	0.050	1		07/26/11 15:00		
Sobek Calculations	Analytical Method: Modified Sobek 3.2							
Acid/Base Potential	**4.3**	tons/1000		1		07/26/11 15:00		
Acid Potential	**<4.3**	tons/1000	4.3	1		07/26/11 15:00		
Lime Requirement	**<5.4**	tons/1000	5.4	1		07/26/11 15:00		
SMP Lime Requirement	**0**	tons/1000	0.0	1		07/26/11 15:00		
Sobek SMP Buffer pH	Analytical Method: Modified Sobek 3.2							
SMP Buffer pH	**7.0**	Std. Units	0.10	1		07/26/11 15:00		
ASA10-3.3 Specific Conductance	Analytical Method: ASA 10-3.3							
Sp.Conductance Saturated Paste	**0.17**	mmhos/cm	0.010	1		07/27/11 12:56		

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QUALITY CONTROL DATA

Project: Black Pine Mine REV
Pace Project No.: 10163246

QC Batch: ICP/14882 Analysis Method: EPA 9081
QC Batch Method: EPA 9081 Analysis Description: Cation Exchange Capacity
Associated Lab Samples: 10163246001, 10163246002, 10163246003, 10163246004, 10163246005, 10163246006, 10163246007, 10163246008, 10163246009, 10163246010

METHOD BLANK: 850915 Matrix: Solid
Associated Lab Samples: 10163246001, 10163246002, 10163246003, 10163246004, 10163246005, 10163246006, 10163246007, 10163246008, 10163246009, 10163246010

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Cation Exchange Capacity	meq/100g	<1.0	1.0	07/29/11 12:24	

LABORATORY CONTROL SAMPLE: 850916

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Cation Exchange Capacity	meq/100g	53.1	33.8	64	62-138	

SAMPLE DUPLICATE: 850917

Parameter	Units	10163246001 Result	Dup Result	RPD	Max RPD	Qualifiers
Cation Exchange Capacity	meq/100g	49.8	48.8	2	47	

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QUALITY CONTROL DATA

Project: Black Pine Mine REV
Pace Project No.: 10163246

QC Batch: MERP/5632 Analysis Method: EPA 7471
QC Batch Method: EPA 7471 Analysis Description: 7471 Mercury
Associated Lab Samples: 10163246001, 10163246002, 10163246003, 10163246004, 10163246005, 10163246006, 10163246007, 10163246008, 10163246009, 10163246010

METHOD BLANK: 1014982 Matrix: Solid
Associated Lab Samples: 10163246001, 10163246002, 10163246003, 10163246004, 10163246005, 10163246006, 10163246007, 10163246008, 10163246009, 10163246010

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Mercury	mg/kg	<0.020	0.020	07/31/11 12:13	

LABORATORY CONTROL SAMPLE: 1014983

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Mercury	mg/kg	.48	0.48	100	80-120	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 1014984 1014985

Parameter	Units	10163246001 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Mercury	mg/kg	0.14	.51	.51	0.30	0.34	31	38	80-120	11	20	M1

MATRIX SPIKE SAMPLE: 1014986

Parameter	Units	10163483010 Result	Spike Conc.	MS Result	MS % Rec	% Rec Limits	Qualifiers
Mercury	mg/kg	3.6	.49	4.6	208	80-120	M6

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QUALITY CONTROL DATA

Project: Black Pine Mine REV
Pace Project No.: 10163246

QC Batch: MPRP/27469 Analysis Method: CLPICPAES
QC Batch Method: ASA 13-3.5.2.2 Analysis Description: CLPICPAES MET
Associated Lab Samples: 10163246001, 10163246002, 10163246003, 10163246004, 10163246005, 10163246006, 10163246007, 10163246008, 10163246009, 10163246010

METHOD BLANK: 1024549 Matrix: Solid
Associated Lab Samples: 10163246001, 10163246002, 10163246003, 10163246004, 10163246005, 10163246006, 10163246007, 10163246008, 10163246009, 10163246010

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Potassium	mg/kg	<124	124	08/01/11 17:43	

LABORATORY CONTROL SAMPLE & LCSD: 1024550 1024551

Parameter	Units	Spike Conc.	LCS Result	LCSD Result	LCS % Rec	LCSD % Rec	% Rec Limits	RPD	Max RPD	Qualifiers
Potassium	mg/kg	156	177	210	114	135	80-120	17	20	

SAMPLE DUPLICATE: 1024552

Parameter	Units	10163634008 Result	Dup Result	RPD	Max RPD	Qualifiers
Potassium	mg/kg	<116	<125		30	

SAMPLE DUPLICATE: 1024553

Parameter	Units	10163644010 Result	Dup Result	RPD	Max RPD	Qualifiers
Potassium	mg/kg	<123	<125		30	

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QUALITY CONTROL DATA

Project: Black Pine Mine REV
Pace Project No.: 10163246

QC Batch: MPRP/27163 Analysis Method: EPA 6020
QC Batch Method: EPA 3050 Analysis Description: 6020 MET
Associated Lab Samples: 10163246001, 10163246002, 10163246003, 10163246004, 10163246005, 10163246006, 10163246007, 10163246008, 10163246009, 10163246010

METHOD BLANK: 1014833 Matrix: Solid
Associated Lab Samples: 10163246001, 10163246002, 10163246003, 10163246004, 10163246005, 10163246006, 10163246007, 10163246008, 10163246009, 10163246010

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Antimony	mg/kg	<0.49	0.49	07/31/11 15:14	
Arsenic	mg/kg	<0.49	0.49	07/31/11 15:14	
Barium	mg/kg	<0.29	0.29	07/31/11 15:14	
Cadmium	mg/kg	<0.078	0.078	07/31/11 15:14	
Chromium	mg/kg	<0.49	0.49	07/31/11 15:14	
Cobalt	mg/kg	<0.49	0.49	07/31/11 15:14	
Copper	mg/kg	<0.49	0.49	07/31/11 15:14	
Iron	mg/kg	<48.5	48.5	07/31/11 15:14	
Lead	mg/kg	0.34	0.097	07/31/11 15:14	P8
Manganese	mg/kg	<0.49	0.49	07/31/11 15:14	
Nickel	mg/kg	<0.49	0.49	07/31/11 15:14	
Zinc	mg/kg	<4.9	4.9	07/31/11 15:14	

LABORATORY CONTROL SAMPLE: 1014834

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Antimony	mg/kg	16	17.7	111	80-120	
Arsenic	mg/kg	16	17.0	106	80-120	
Barium	mg/kg	16	18.0	113	80-120	
Cadmium	mg/kg	16	17.5	109	80-120	
Chromium	mg/kg	16	17.8	112	80-120	
Cobalt	mg/kg	16	17.9	112	80-120	
Copper	mg/kg	16	17.9	112	80-120	
Iron	mg/kg	200	227	114	80-120	
Lead	mg/kg	16	17.8	111	80-120	
Manganese	mg/kg	16	18.2	114	80-120	
Nickel	mg/kg	16	18.3	114	80-120	
Zinc	mg/kg	16	17.5	109	80-120	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 1014835 1014836

Parameter	Units	10163246001 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Antimony	mg/kg	0.60	19.6	19.5	9.8	8.9	47	43	75-125	10	30	M6
Arsenic	mg/kg	7.2	19.6	19.5	27.9	32.2	105	129	75-125	15	30	M6
Barium	mg/kg	248	19.6	19.5	334	511	437	1350	75-125	42	30	D6,M6
Cadmium	mg/kg	0.31	19.6	19.5	18.5	18.5	93	93	75-125	.3	30	
Chromium	mg/kg	4.4	19.6	19.5	24.9	25.9	104	111	75-125	4	30	

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QUALITY CONTROL DATA

Project: Black Pine Mine REV
Pace Project No.: 10163246

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 1014835 1014836

Parameter	Units	10163246001 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Cobalt	mg/kg	3.3	19.6	19.5	21.9	22.7	94	99	75-125	4	30	
Copper	mg/kg	5.7	19.6	19.5	25.0	28.6	98	118	75-125	14	30	
Iron	mg/kg	6090	245	243	8220	10800	870	1930	75-125	27	30	D6,M6
Lead	mg/kg	5.4	19.6	19.5	25.3	28.9	101	120	75-125	13	30	
Manganese	mg/kg	782	19.6	19.5	1490	2350	3610	8050	75-125	45	30	D6,E, M6
Nickel	mg/kg	8.5	19.6	19.5	27.8	29.9	99	110	75-125	7	30	
Zinc	mg/kg	42.7	19.6	19.5	75.3	102	166	305	75-125	30	30	D6,M6

MATRIX SPIKE SAMPLE: 1014837

Parameter	Units	10163606001 Result	Spike Conc.	MS Result	MS % Rec	% Rec Limits	Qualifiers
Antimony	mg/kg	25.8	16.3	38.9	80	75-125	
Arsenic	mg/kg	143	16.3	50.6	-569	75-125	M6
Barium	mg/kg	132	16.3	164	198	75-125	M6
Cadmium	mg/kg	1.3	16.3	17.4	99	75-125	
Chromium	mg/kg	8.1	16.3	26.2	111	75-125	
Cobalt	mg/kg	7.2	16.3	21.0	85	75-125	
Copper	mg/kg	547	16.3	697	924	75-125	M6
Iron	mg/kg	15000	204	15500	257	75-125	M6
Lead	mg/kg	339	16.3	169	-1040	75-125	M6
Manganese	mg/kg	352	16.3	300	-318	75-125	M6
Nickel	mg/kg	9.4	16.3	26.7	106	75-125	
Zinc	mg/kg	85.6	16.3	107	132	75-125	M6

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QUALITY CONTROL DATA

Project: Black Pine Mine REV
Pace Project No.: 10163246

QC Batch: MPRP/27229
QC Batch Method: % Moisture
Analysis Method: % Moisture
Analysis Description: Dry Weight/Percent Moisture
Associated Lab Samples: 10163246001

SAMPLE DUPLICATE: 1016815

Parameter	Units	10163138001 Result	Dup Result	RPD	Max RPD	Qualifiers
Percent Moisture	%	72.1	77.1	7	30	

SAMPLE DUPLICATE: 1016867

Parameter	Units	10163235013 Result	Dup Result	RPD	Max RPD	Qualifiers
Percent Moisture	%	19.5	15.4	23	30	

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QUALITY CONTROL DATA

Project: Black Pine Mine REV
Pace Project No.: 10163246

QC Batch: MPRP/27256 Analysis Method: % Moisture
QC Batch Method: % Moisture Analysis Description: Dry Weight/Percent Moisture
Associated Lab Samples: 10163246002, 10163246003, 10163246004, 10163246005, 10163246006, 10163246007, 10163246008, 10163246009, 10163246010

SAMPLE DUPLICATE: 1017553

Parameter	Units	10163864002 Result	Dup Result	RPD	Max RPD	Qualifiers
Percent Moisture	%	23.9	22.3	7	30	

SAMPLE DUPLICATE: 1017554

Parameter	Units	10163606003 Result	Dup Result	RPD	Max RPD	Qualifiers
Percent Moisture	%	15.4	16.0	4	30	

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QUALITY CONTROL DATA

Project: Black Pine Mine REV
Pace Project No.: 10163246

QC Batch: MT/6442 Analysis Method: ASA 33-3.2/EPA 353.2
QC Batch Method: ASA 33-3.2/EPA 353.2 Analysis Description: 353.2 Nitrate + Nitrite
Associated Lab Samples: 10163246001, 10163246002, 10163246003, 10163246004, 10163246005, 10163246006, 10163246007, 10163246008, 10163246009, 10163246010

METHOD BLANK: 1016641 Matrix: Solid
Associated Lab Samples: 10163246001, 10163246002, 10163246003, 10163246004, 10163246005, 10163246006, 10163246007, 10163246008, 10163246009, 10163246010

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Available Nitrate	mg/kg	<5.0	5.0	07/26/11 17:37	

LABORATORY CONTROL SAMPLE: 1016642

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Available Nitrate	mg/kg	25	24.0	96	76-124	

SAMPLE DUPLICATE: 1016643

Parameter	Units	10163246004 Result	Dup Result	RPD	Max RPD	Qualifiers
Available Nitrate	mg/kg	<5.0	<5.0		30	

SAMPLE DUPLICATE: 1016644

Parameter	Units	10163644008 Result	Dup Result	RPD	Max RPD	Qualifiers
Available Nitrate	mg/kg	<5.0	<5.0		30	

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QUALITY CONTROL DATA

Project: Black Pine Mine REV
Pace Project No.: 10163246

QC Batch: MT/6438 Analysis Method: ASA 29-3.5.2
QC Batch Method: ASA 29-3.5.2 Analysis Description: Organic Matter ASA 29
Associated Lab Samples: 10163246001, 10163246002, 10163246003, 10163246004, 10163246005, 10163246007, 10163246008, 10163246009, 10163246010

METHOD BLANK: 1016290 Matrix: Solid
Associated Lab Samples: 10163246001, 10163246002, 10163246003, 10163246004, 10163246005, 10163246007, 10163246008, 10163246009, 10163246010

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Organic Matter	% (w/w)	<0.10	0.10	07/21/11 16:50	

LABORATORY CONTROL SAMPLE: 1016291

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Organic Matter	% (w/w)	3.1	3.3	107	69-131	

SAMPLE DUPLICATE: 1016293

Parameter	Units	10163634008 Result	Dup Result	RPD	Max RPD	Qualifiers
Organic Matter	% (w/w)	0.13	<0.10		30	

SAMPLE DUPLICATE: 1018103

Parameter	Units	10163246002 Result	Dup Result	RPD	Max RPD	Qualifiers
Organic Matter	% (w/w)	3.3	3.2	2	30	

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QUALITY CONTROL DATA

Project: Black Pine Mine REV
Pace Project No.: 10163246

QC Batch: MT/6460
QC Batch Method: ASA 29-3.5.2
Analysis Method: ASA 29-3.5.2
Analysis Description: Organic Matter ASA 29
Associated Lab Samples: 10163246006

METHOD BLANK: 1017980 Matrix: Solid
Associated Lab Samples: 10163246006

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Organic Matter	% (w/w)	<0.10	0.10	07/22/11 11:05	

LABORATORY CONTROL SAMPLE: 1017981

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Organic Matter	% (w/w)	3.1	3.3	105	69-131	

SAMPLE DUPLICATE: 1016289

Parameter	Units	10163639012 Result	Dup Result	RPD	Max RPD	Qualifiers
Organic Matter	% (w/w)	2.9	3.0	4	30	

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QUALITY CONTROL DATA

Project: Black Pine Mine REV
Pace Project No.: 10163246

QC Batch: MT/6426 Analysis Method: ASA 10-3.2
QC Batch Method: ASA 10-3.2 Analysis Description: ASA 10-3.2 pH saturated paste
Associated Lab Samples: 10163246001, 10163246002, 10163246003, 10163246004, 10163246005, 10163246006, 10163246007, 10163246008, 10163246009, 10163246010

SAMPLE DUPLICATE: 1017424

Parameter	Units	10163246004 Result	Dup Result	RPD	Max RPD	Qualifiers
pH, Saturated Paste	Std. Units	7.0	6.9	.7	20	

SAMPLE DUPLICATE: 1017425

Parameter	Units	10163645001 Result	Dup Result	RPD	Max RPD	Qualifiers
pH, Saturated Paste	Std. Units	6.9	6.7	2	20	

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QUALITY CONTROL DATA

Project: Black Pine Mine REV
Pace Project No.: 10163246

QC Batch: MT/6443 Analysis Method: ASA 24-5.4/SM4500
QC Batch Method: ASA 24-5.4/SM4500 Analysis Description: SM4500P-E, Total Phosphorus
Associated Lab Samples: 10163246001, 10163246002, 10163246003, 10163246004, 10163246005, 10163246006, 10163246007, 10163246008, 10163246009, 10163246010

METHOD BLANK: 1016645 Matrix: Solid
Associated Lab Samples: 10163246001, 10163246002, 10163246003, 10163246004, 10163246005, 10163246006, 10163246007, 10163246008, 10163246009, 10163246010

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Available Phosphorus	mg/kg	<1.0	1.0	07/25/11 14:30	

LABORATORY CONTROL SAMPLE: 1016646

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Available Phosphorus	mg/kg	10	8.0	80	56-144	

SAMPLE DUPLICATE: 1016647

Parameter	Units	10163246004 Result	Dup Result	RPD	Max RPD	Qualifiers
Available Phosphorus	mg/kg	2.8	3.1	9	30	

SAMPLE DUPLICATE: 1016648

Parameter	Units	10163644006 Result	Dup Result	RPD	Max RPD	Qualifiers
Available Phosphorus	mg/kg	1.4	1.4	3	30	

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QUALITY CONTROL DATA

Project: Black Pine Mine REV
Pace Project No.: 10163246

QC Batch: MT/6480 Analysis Method: Modified Sobek 3.2
QC Batch Method: Modified Sobek 3.2 Analysis Description: Sobek Acid Base Potential
Associated Lab Samples: 10163246001, 10163246002, 10163246003, 10163246004, 10163246005, 10163246006, 10163246007, 10163246008, 10163246009, 10163246010

METHOD BLANK: 1019986 Matrix: Solid
Associated Lab Samples: 10163246001, 10163246002, 10163246003, 10163246004, 10163246005, 10163246006, 10163246007, 10163246008, 10163246009, 10163246010

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Neutralization Potential	tons/1000	<0.5	0.50	07/29/11 00:00	

SAMPLE DUPLICATE: 1019631

Parameter	Units	10163606002 Result	Dup Result	RPD	Max RPD	Qualifiers
Neutralization Potential	tons/1000	1.5	1.7			

SAMPLE DUPLICATE: 1019632

Parameter	Units	10163246007 Result	Dup Result	RPD	Max RPD	Qualifiers
Neutralization Potential	tons/1000	4.0	5.7			

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QUALITY CONTROL DATA

Project: Black Pine Mine REV
Pace Project No.: 10163246

QC Batch: MT/6452 Analysis Method: Modified Sobek 3.2
QC Batch Method: Modified Sobek 3.2 Analysis Description: Sobek Extractable Sulfur
Associated Lab Samples: 10163246001, 10163246002, 10163246003, 10163246004, 10163246005, 10163246006, 10163246007, 10163246008, 10163246009, 10163246010

METHOD BLANK: 1017262 Matrix: Solid
Associated Lab Samples: 10163246001, 10163246002, 10163246003, 10163246004, 10163246005, 10163246006, 10163246007, 10163246008, 10163246009, 10163246010

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Total Sulfur	% (w/w)	<0.050	0.050	07/29/11 16:11	

SAMPLE DUPLICATE: 1017264

Parameter	Units	10163606002 Result	Dup Result	RPD	Max RPD	Qualifiers
Total Sulfur	% (w/w)	0.228	0.211	8		

SAMPLE DUPLICATE: 1017265

Parameter	Units	10163246007 Result	Dup Result	RPD	Max RPD	Qualifiers
Total Sulfur	% (w/w)	<0.050	<0.050			

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QUALITY CONTROL DATA

Project: Black Pine Mine REV
Pace Project No.: 10163246

QC Batch: MT/6481 Analysis Method: Modified Sobek 3.2
QC Batch Method: Modified Sobek 3.2 Analysis Description: Sobek SMP Buffer pH
Associated Lab Samples: 10163246001, 10163246002, 10163246003, 10163246004, 10163246005, 10163246006, 10163246007, 10163246008, 10163246009, 10163246010

LABORATORY CONTROL SAMPLE: 1019634

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
SMP Buffer pH	Std. Units		7.0			

SAMPLE DUPLICATE: 1019635

Parameter	Units	10163606002 Result	Dup Result	RPD	Max RPD	Qualifiers
SMP Buffer pH	Std. Units	6.6	6.6	0	20	

SAMPLE DUPLICATE: 1019636

Parameter	Units	10163246007 Result	Dup Result	RPD	Max RPD	Qualifiers
SMP Buffer pH	Std. Units	6.8	6.8	.7	20	

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QUALITY CONTROL DATA

Project: Black Pine Mine REV
Pace Project No.: 10163246

QC Batch: MT/6547 Analysis Method: ASA 10-3.3
QC Batch Method: ASA 10-3.3 Analysis Description: ASA 10-3.3 Specific Conductance
Associated Lab Samples: 10163246001, 10163246002, 10163246003, 10163246004, 10163246005, 10163246006, 10163246007, 10163246008, 10163246009, 10163246010

METHOD BLANK: 1022940 Matrix: Water
Associated Lab Samples: 10163246001, 10163246002, 10163246003, 10163246004, 10163246005, 10163246006, 10163246007, 10163246008, 10163246009, 10163246010

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Sp.Conductance Saturated Paste	mmhos/cm	<0.010	0.010	07/27/11 12:56	

LABORATORY CONTROL SAMPLE: 1022941

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Sp.Conductance Saturated Paste	mmhos/cm	.85	0.80	94	53-147	

SAMPLE DUPLICATE: 1022942

Parameter	Units	10163246004 Result	Dup Result	RPD	Max RPD	Qualifiers
Sp.Conductance Saturated Paste	mmhos/cm	0.091	0.088	3	20	

SAMPLE DUPLICATE: 1022943

Parameter	Units	10163645001 Result	Dup Result	RPD	Max RPD	Qualifiers
Sp.Conductance Saturated Paste	mmhos/cm	0.20	0.14	33	20	D6

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602 S 25th Street
Billings, MT 591014549
(406)254-7226

QUALIFIERS

Project: Black Pine Mine REV
Pace Project No.: 10163246

DEFINITIONS

DF - Dilution Factor, if reported, represents the factor applied to the reported data due to changes in sample preparation, dilution of the sample aliquot, or moisture content.

ND - Not Detected at or above adjusted reporting limit.

J - Estimated concentration above the adjusted method detection limit and below the adjusted reporting limit.

MDL - Adjusted Method Detection Limit.

S - Surrogate

1,2-Diphenylhydrazine (8270 listed analyte) decomposes to Azobenzene.

Consistent with EPA guidelines, unrounded data are displayed and have been used to calculate % recovery and RPD values.

LCS(D) - Laboratory Control Sample (Duplicate)

MS(D) - Matrix Spike (Duplicate)

DUP - Sample Duplicate

RPD - Relative Percent Difference

NC - Not Calculable.

SG - Silica Gel - Clean-Up

U - Indicates the compound was analyzed for, but not detected.

N-Nitrosodiphenylamine decomposes and cannot be separated from Diphenylamine using Method 8270. The result reported for each analyte is a combined concentration.

LABORATORIES

PASI-K	Pace Analytical Services - Kansas City
PASI-M	Pace Analytical Services - Minneapolis
PASI-MT	Pace Analytical Services - Montana

ANALYTE QUALIFIERS

D6	The relative percent difference (RPD) between the sample and sample duplicate exceeded laboratory control limits.
E	Analyte concentration exceeded the calibration range. The reported result is estimated.
M1	Matrix spike recovery exceeded QC limits. Batch accepted based on laboratory control sample (LCS) recovery.
M6	Matrix spike and Matrix spike duplicate recovery not evaluated against control limits due to sample dilution.
P8	Analyte was detected in the method blank. All associated samples had concentrations of at least ten times greater than the blank or were below the reporting limit.

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QUALITY CONTROL DATA CROSS REFERENCE TABLE

Project: Black Pine Mine REV
Pace Project No.: 10163246

Lab ID	Sample ID	QC Batch Method	QC Batch	Analytical Method	Analytical Batch
10163246001	**BP-RY-SS-02-00**	ASA 13-3.5.2.2	MPRP/27469	CLPICPAES	ICP/11638
10163246002	**BP-RY-SS-01-00**	ASA 13-3.5.2.2	MPRP/27469	CLPICPAES	ICP/11638
10163246003	**BP-RY-SS-03-00**	ASA 13-3.5.2.2	MPRP/27469	CLPICPAES	ICP/11638
10163246004	**BP-RY-SS-03-14**	ASA 13-3.5.2.2	MPRP/27469	CLPICPAES	ICP/11638
10163246005	**BP-RY-SS-02-02**	ASA 13-3.5.2.2	MPRP/27469	CLPICPAES	ICP/11638
10163246006	**BP-RY-SS-04-00**	ASA 13-3.5.2.2	MPRP/27469	CLPICPAES	ICP/11638
10163246007	**BP-RY-SS-04-02**	ASA 13-3.5.2.2	MPRP/27469	CLPICPAES	ICP/11638
10163246008	**BP-RY-SS-04-10**	ASA 13-3.5.2.2	MPRP/27469	CLPICPAES	ICP/11638
10163246009	**BP-RY-SS-05-00**	ASA 13-3.5.2.2	MPRP/27469	CLPICPAES	ICP/11638
10163246010	**BP-RY-SS-05-02**	ASA 13-3.5.2.2	MPRP/27469	CLPICPAES	ICP/11638
10163246001	**BP-RY-SS-02-00**	EPA 9081	ICP/14882	EPA 9081	ICP/12949
10163246002	**BP-RY-SS-01-00**	EPA 9081	ICP/14882	EPA 9081	ICP/12949
10163246003	**BP-RY-SS-03-00**	EPA 9081	ICP/14882	EPA 9081	ICP/12949
10163246004	**BP-RY-SS-03-14**	EPA 9081	ICP/14882	EPA 9081	ICP/12949
10163246005	**BP-RY-SS-02-02**	EPA 9081	ICP/14882	EPA 9081	ICP/12949
10163246006	**BP-RY-SS-04-00**	EPA 9081	ICP/14882	EPA 9081	ICP/12949
10163246007	**BP-RY-SS-04-02**	EPA 9081	ICP/14882	EPA 9081	ICP/12949
10163246008	**BP-RY-SS-04-10**	EPA 9081	ICP/14882	EPA 9081	ICP/12949
10163246009	**BP-RY-SS-05-00**	EPA 9081	ICP/14882	EPA 9081	ICP/12949
10163246010	**BP-RY-SS-05-02**	EPA 9081	ICP/14882	EPA 9081	ICP/12949
10163246001	**BP-RY-SS-02-00**	EPA 3050	MPRP/27163	EPA 6020	ICPM/11135
10163246002	**BP-RY-SS-01-00**	EPA 3050	MPRP/27163	EPA 6020	ICPM/11135
10163246003	**BP-RY-SS-03-00**	EPA 3050	MPRP/27163	EPA 6020	ICPM/11135
10163246004	**BP-RY-SS-03-14**	EPA 3050	MPRP/27163	EPA 6020	ICPM/11135
10163246005	**BP-RY-SS-02-02**	EPA 3050	MPRP/27163	EPA 6020	ICPM/11135
10163246006	**BP-RY-SS-04-00**	EPA 3050	MPRP/27163	EPA 6020	ICPM/11135
10163246007	**BP-RY-SS-04-02**	EPA 3050	MPRP/27163	EPA 6020	ICPM/11135
10163246008	**BP-RY-SS-04-10**	EPA 3050	MPRP/27163	EPA 6020	ICPM/11135
10163246009	**BP-RY-SS-05-00**	EPA 3050	MPRP/27163	EPA 6020	ICPM/11135
10163246010	**BP-RY-SS-05-02**	EPA 3050	MPRP/27163	EPA 6020	ICPM/11135
10163246001	**BP-RY-SS-02-00**	EPA 7471	MERP/5632	EPA 7471	MERC/6492
10163246002	**BP-RY-SS-01-00**	EPA 7471	MERP/5632	EPA 7471	MERC/6492
10163246003	**BP-RY-SS-03-00**	EPA 7471	MERP/5632	EPA 7471	MERC/6492
10163246004	**BP-RY-SS-03-14**	EPA 7471	MERP/5632	EPA 7471	MERC/6492
10163246005	**BP-RY-SS-02-02**	EPA 7471	MERP/5632	EPA 7471	MERC/6492
10163246006	**BP-RY-SS-04-00**	EPA 7471	MERP/5632	EPA 7471	MERC/6492
10163246007	**BP-RY-SS-04-02**	EPA 7471	MERP/5632	EPA 7471	MERC/6492
10163246008	**BP-RY-SS-04-10**	EPA 7471	MERP/5632	EPA 7471	MERC/6492
10163246009	**BP-RY-SS-05-00**	EPA 7471	MERP/5632	EPA 7471	MERC/6492
10163246010	**BP-RY-SS-05-02**	EPA 7471	MERP/5632	EPA 7471	MERC/6492
10163246001	**BP-RY-SS-02-00**	% Moisture	MPRP/27229		
10163246002	**BP-RY-SS-01-00**	% Moisture	MPRP/27256		
10163246003	**BP-RY-SS-03-00**	% Moisture	MPRP/27256		
10163246004	**BP-RY-SS-03-14**	% Moisture	MPRP/27256		
10163246005	**BP-RY-SS-02-02**	% Moisture	MPRP/27256		
10163246006	**BP-RY-SS-04-00**	% Moisture	MPRP/27256		

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QUALITY CONTROL DATA CROSS REFERENCE TABLE

Project: Black Pine Mine REV
Pace Project No.: 10163246

Lab ID	Sample ID	QC Batch Method	QC Batch	Analytical Method	Analytical Batch
10163246007	**BP-RY-SS-04-02**	% Moisture	MPRP/27256		
10163246008	**BP-RY-SS-04-10**	% Moisture	MPRP/27256		
10163246009	**BP-RY-SS-05-00**	% Moisture	MPRP/27256		
10163246010	**BP-RY-SS-05-02**	% Moisture	MPRP/27256		
10163246001	**BP-RY-SS-02-00**	ASA 33-3.2/EPA 353.2	MT/6442		
10163246002	**BP-RY-SS-01-00**	ASA 33-3.2/EPA 353.2	MT/6442		
10163246003	**BP-RY-SS-03-00**	ASA 33-3.2/EPA 353.2	MT/6442		
10163246004	**BP-RY-SS-03-14**	ASA 33-3.2/EPA 353.2	MT/6442		
10163246005	**BP-RY-SS-02-02**	ASA 33-3.2/EPA 353.2	MT/6442		
10163246006	**BP-RY-SS-04-00**	ASA 33-3.2/EPA 353.2	MT/6442		
10163246007	**BP-RY-SS-04-02**	ASA 33-3.2/EPA 353.2	MT/6442		
10163246008	**BP-RY-SS-04-10**	ASA 33-3.2/EPA 353.2	MT/6442		
10163246009	**BP-RY-SS-05-00**	ASA 33-3.2/EPA 353.2	MT/6442		
10163246010	**BP-RY-SS-05-02**	ASA 33-3.2/EPA 353.2	MT/6442		
10163246001	**BP-RY-SS-02-00**	ASTM D421	MT/6412		
10163246002	**BP-RY-SS-01-00**	ASTM D421	MT/6412		
10163246003	**BP-RY-SS-03-00**	ASTM D421	MT/6412		
10163246004	**BP-RY-SS-03-14**	ASTM D421	MT/6412		
10163246005	**BP-RY-SS-02-02**	ASTM D421	MT/6412		
10163246006	**BP-RY-SS-04-00**	ASTM D421	MT/6412		
10163246007	**BP-RY-SS-04-02**	ASTM D421	MT/6412		
10163246008	**BP-RY-SS-04-10**	ASTM D421	MT/6412		
10163246009	**BP-RY-SS-05-00**	ASTM D421	MT/6412		
10163246010	**BP-RY-SS-05-02**	ASTM D421	MT/6412		
10163246001	**BP-RY-SS-02-00**	ASA 29-3.5.2	MT/6438		
10163246002	**BP-RY-SS-01-00**	ASA 29-3.5.2	MT/6438		
10163246003	**BP-RY-SS-03-00**	ASA 29-3.5.2	MT/6438		
10163246004	**BP-RY-SS-03-14**	ASA 29-3.5.2	MT/6438		
10163246005	**BP-RY-SS-02-02**	ASA 29-3.5.2	MT/6438		
10163246006	**BP-RY-SS-04-00**	ASA 29-3.5.2	MT/6460		
10163246007	**BP-RY-SS-04-02**	ASA 29-3.5.2	MT/6438		
10163246008	**BP-RY-SS-04-10**	ASA 29-3.5.2	MT/6438		
10163246009	**BP-RY-SS-05-00**	ASA 29-3.5.2	MT/6438		
10163246010	**BP-RY-SS-05-02**	ASA 29-3.5.2	MT/6438		
10163246001	**BP-RY-SS-02-00**	ASA 10-3.2	MT/6426		
10163246002	**BP-RY-SS-01-00**	ASA 10-3.2	MT/6426		
10163246003	**BP-RY-SS-03-00**	ASA 10-3.2	MT/6426		
10163246004	**BP-RY-SS-03-14**	ASA 10-3.2	MT/6426		
10163246005	**BP-RY-SS-02-02**	ASA 10-3.2	MT/6426		
10163246006	**BP-RY-SS-04-00**	ASA 10-3.2	MT/6426		
10163246007	**BP-RY-SS-04-02**	ASA 10-3.2	MT/6426		
10163246008	**BP-RY-SS-04-10**	ASA 10-3.2	MT/6426		
10163246009	**BP-RY-SS-05-00**	ASA 10-3.2	MT/6426		
10163246010	**BP-RY-SS-05-02**	ASA 10-3.2	MT/6426		
10163246001	**BP-RY-SS-02-00**	ASA 24-5.4/SM4500	MT/6443		

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QUALITY CONTROL DATA CROSS REFERENCE TABLE

Project: Black Pine Mine REV
Pace Project No.: 10163246

Lab ID	Sample ID	QC Batch Method	QC Batch	Analytical Method	Analytical Batch
10163246002	**BP-RY-SS-01-00**	ASA 24-5.4/SM4500	MT/6443		
10163246003	**BP-RY-SS-03-00**	ASA 24-5.4/SM4500	MT/6443		
10163246004	**BP-RY-SS-03-14**	ASA 24-5.4/SM4500	MT/6443		
10163246005	**BP-RY-SS-02-02**	ASA 24-5.4/SM4500	MT/6443		
10163246006	**BP-RY-SS-04-00**	ASA 24-5.4/SM4500	MT/6443		
10163246007	**BP-RY-SS-04-02**	ASA 24-5.4/SM4500	MT/6443		
10163246008	**BP-RY-SS-04-10**	ASA 24-5.4/SM4500	MT/6443		
10163246009	**BP-RY-SS-05-00**	ASA 24-5.4/SM4500	MT/6443		
10163246010	**BP-RY-SS-05-02**	ASA 24-5.4/SM4500	MT/6443		
10163246001	**BP-RY-SS-02-00**	Modified Sobek 3.2	MT/6480		
10163246002	**BP-RY-SS-01-00**	Modified Sobek 3.2	MT/6480		
10163246003	**BP-RY-SS-03-00**	Modified Sobek 3.2	MT/6480		
10163246004	**BP-RY-SS-03-14**	Modified Sobek 3.2	MT/6480		
10163246005	**BP-RY-SS-02-02**	Modified Sobek 3.2	MT/6480		
10163246006	**BP-RY-SS-04-00**	Modified Sobek 3.2	MT/6480		
10163246007	**BP-RY-SS-04-02**	Modified Sobek 3.2	MT/6480		
10163246008	**BP-RY-SS-04-10**	Modified Sobek 3.2	MT/6480		
10163246009	**BP-RY-SS-05-00**	Modified Sobek 3.2	MT/6480		
10163246010	**BP-RY-SS-05-02**	Modified Sobek 3.2	MT/6480		
10163246001	**BP-RY-SS-02-00**	Modified Sobek 3.2	MT/6452		
10163246002	**BP-RY-SS-01-00**	Modified Sobek 3.2	MT/6452		
10163246003	**BP-RY-SS-03-00**	Modified Sobek 3.2	MT/6452		
10163246004	**BP-RY-SS-03-14**	Modified Sobek 3.2	MT/6452		
10163246005	**BP-RY-SS-02-02**	Modified Sobek 3.2	MT/6452		
10163246006	**BP-RY-SS-04-00**	Modified Sobek 3.2	MT/6452		
10163246007	**BP-RY-SS-04-02**	Modified Sobek 3.2	MT/6452		
10163246008	**BP-RY-SS-04-10**	Modified Sobek 3.2	MT/6452		
10163246009	**BP-RY-SS-05-00**	Modified Sobek 3.2	MT/6452		
10163246010	**BP-RY-SS-05-02**	Modified Sobek 3.2	MT/6452		
10163246001	**BP-RY-SS-02-00**	Modified Sobek 3.2	MT/6499		
10163246002	**BP-RY-SS-01-00**	Modified Sobek 3.2	MT/6499		
10163246003	**BP-RY-SS-03-00**	Modified Sobek 3.2	MT/6499		
10163246004	**BP-RY-SS-03-14**	Modified Sobek 3.2	MT/6499		
10163246005	**BP-RY-SS-02-02**	Modified Sobek 3.2	MT/6499		
10163246006	**BP-RY-SS-04-00**	Modified Sobek 3.2	MT/6499		
10163246007	**BP-RY-SS-04-02**	Modified Sobek 3.2	MT/6499		
10163246008	**BP-RY-SS-04-10**	Modified Sobek 3.2	MT/6499		
10163246009	**BP-RY-SS-05-00**	Modified Sobek 3.2	MT/6499		
10163246010	**BP-RY-SS-05-02**	Modified Sobek 3.2	MT/6499		
10163246001	**BP-RY-SS-02-00**	Modified Sobek 3.2	MT/6481		
10163246002	**BP-RY-SS-01-00**	Modified Sobek 3.2	MT/6481		
10163246003	**BP-RY-SS-03-00**	Modified Sobek 3.2	MT/6481		
10163246004	**BP-RY-SS-03-14**	Modified Sobek 3.2	MT/6481		
10163246005	**BP-RY-SS-02-02**	Modified Sobek 3.2	MT/6481		
10163246006	**BP-RY-SS-04-00**	Modified Sobek 3.2	MT/6481		
10163246007	**BP-RY-SS-04-02**	Modified Sobek 3.2	MT/6481		
10163246008	**BP-RY-SS-04-10**	Modified Sobek 3.2	MT/6481		

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QUALITY CONTROL DATA CROSS REFERENCE TABLE

Project: Black Pine Mine REV
Pace Project No.: 10163246

Lab ID	Sample ID	QC Batch Method	QC Batch	Analytical Method	Analytical Batch
10163246009	**BP-RY-SS-05-00**	Modified Sobek 3.2	MT/6481		
10163246010	**BP-RY-SS-05-02**	Modified Sobek 3.2	MT/6481		
10163246001	**BP-RY-SS-02-00**	ASA 10-3.3	MT/6547		
10163246002	**BP-RY-SS-01-00**	ASA 10-3.3	MT/6547		
10163246003	**BP-RY-SS-03-00**	ASA 10-3.3	MT/6547		
10163246004	**BP-RY-SS-03-14**	ASA 10-3.3	MT/6547		
10163246005	**BP-RY-SS-02-02**	ASA 10-3.3	MT/6547		
10163246006	**BP-RY-SS-04-00**	ASA 10-3.3	MT/6547		
10163246007	**BP-RY-SS-04-02**	ASA 10-3.3	MT/6547		
10163246008	**BP-RY-SS-04-10**	ASA 10-3.3	MT/6547		
10163246009	**BP-RY-SS-05-00**	ASA 10-3.3	MT/6547		
10163246010	**BP-RY-SS-05-02**	ASA 10-3.3	MT/6547		

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CHAIN-OF-CUSTODY / Analytical Request Document

Pace Analytical® www.pacelabs.com

The Chain-of-Custody is a LEGAL DOCUMENT. All relevant fields must be completed accurately.

Page: 1 of 1

1429996

Section A Required Client Information:

Company: Herrera
Address:
Email To: Khouck@herrerainc.com
Phone: Fax:
Requested Due Date/TAT:

Section B Required Project Information:

Report To: Kevin Houck
Copy To:
Purchase Order No.:
Project Name: Black Pine Mine
Project Number:

Section C Invoice Information:

Attention:
Company Name: DEQ
Address:
Pace Quote Reference:
Pace Project Manager:
Pace Profile #:

REGULATORY AGENCY

☐ NPDES ☐ GROUND WATER ☐ DRINKING WATER
☐ UST ☐ RCRA ☐ OTHER

Site Location STATE: MT

Section D Required Client Information

SAMPLE ID (A-Z, 0-9 / ,-) Sample IDs MUST BE UNIQUE

Matrix Codes — MATRIX / CODE: Drinking Water DW; Water WT; Waste Water WW; Product P; Soil/Solid SL; Oil OL; Wipe WP; Air AR; Tissue TS; Other OT

Requested Analysis Filtered (Y/N)

ITEM #	SAMPLE ID	MATRIX CODE (see valid codes to left)	SAMPLE TYPE (G=GRAB C=COMP)	COLLECTED: COMPOSITE START DATE	COMPOSITE START TIME	COMPOSITE END/GRAB DATE	COMPOSITE END/GRAB TIME	SAMPLE TEMP AT COLLECTION	# OF CONTAINERS	Preservatives: Unpreserved	H_2SO_4	HNO_3	HCl	NaOH	$Na_2S_2O_3$	Methanol	Other	Analysis Test Y/N	Total Met **	Agri *	Residual Chlorine (Y/N)	Pace Project No./ Lab I.D.
1	BP-RY-SS-02-00	SL	G			7/12/11	0850		2	X									X	X		001
2	BP-RY-SS-01-00	SL	G			7/12/11	0918		2	X									X	X		002
3	BP-RY-SS-03-60	SL	G			7/12/11	1025		2	X									X	X		003
4	BP-RY-SS-03-14	SL	G			7/12/11	1028		2	X									X	X		004
5	BP-RY-SS-02-02	SL	G			7/12/11	0855		2	X									X	X		005
6	BP-RY-SS-04-00	SL	G				1128		2	X									X	X		006
7	BP-RY-SS-04-02	SL	G				1130		2	X									X	X		007
8	BP-RY-SS-04-10	SL	G				1133		2	X									X	X		008
9	BP-RY-SS-05-00	SL	G			7/12/11	1228		2	X									X	X		009
10	BP-RY-SS-05-02	SL	G			7/12/11	1230		2	X									X	X		010
11																		7/12/11				
12																						

* Agri = pH, CEC, conductivity, nitrogen, phosphorous, potassium, OM, lime w/ buff. req. 16163246

ADDITIONAL COMMENTS	RELINQUISHED BY / AFFILIATION	DATE	TIME	ACCEPTED BY / AFFILIATION	DATE	TIME	SAMPLE CONDITIONS			
** = Total Metals = (recoverable) Sb, As, Ba, Cd, Cr, Co, Cu, Fe, Pb, Mn, Hg, Ni, Zn	Cullen/Herrera	7/12/11	1340	Blake Horner	7/12/11	1:40				
	Fed Ex (G)	7/13/11	0900	Kim Pocha/Pace	7/13/11	0900	1H	Y	Y	Y

ORIGINAL

SAMPLER NAME AND SIGNATURE

PRINT Name of SAMPLER:

SIGNATURE of SAMPLER: DATE Signed (MM/DD/YY):

Temp in °C	Received on Ice (Y/N)	Custody Sealed Cooler (Y/N)	Samples Intact (Y/N)

*Important Note: By signing this form you are accepting Pace's NET 30 day payment terms and agreeing to late charges of 1.5% per month for any invoices not paid within 30 days.

F-ALL-Q-020rev.07, 15-May-2007

Sample Condition Upon Receipt

Pace Analytical

Client Name: Black Pine Mine Project # 10163246

(61)

Courier: ☒ Fed Ex ☐ UPS ☐ USPS ☐ Client ☐ Commercial ☐ Pace Other _____

Tracking #: 0457557 150342274

Custody Seal on Cooler/Box Present: ☒ yes ☐ no Seals intact: ☒ yes ☐ no

Packing Material: ☐ Bubble Wrap ☒ Bubble Bags ☐ None ☐ Other _____ Temp Blank: Yes X No _____

Thermometer Used 1383045 or 135 Type of Ice: (Wet) Blue None ☒ Samples on ice, cooling process has begun

Cooler Temperature 1.4 Biological Tissue is Frozen: Yes No

Temp should be above freezing to 6°C

Date and Initials of person examining contents: RW 7/13/11

Comments:

Chain of Custody Present:	☒Yes ☐No ☐N/A	1.
Chain of Custody Filled Out:	☒Yes ☐No ☐N/A	2.
Chain of Custody Relinquished:	☒Yes ☐No ☐N/A	3.
Sampler Name & Signature on COC:	☐Yes ☒No ☐N/A	4.
Samples Arrived within Hold Time:	☒Yes ☐No ☐N/A	5.
Short Hold Time Analysis (<72hr):	☐Yes ☒No ☐N/A	6.
Rush Turn Around Time Requested:	☐Yes ☒No ☐N/A	7.
Sufficient Volume:	☒Yes ☐No ☐N/A	8.
Correct Containers Used:	☒Yes ☐No ☐N/A	9. Also PB used
-Pace Containers Used:	☒Yes ☐No ☐N/A	
Containers Intact:	☒Yes ☐No ☐N/A	10.
Filtered volume received for Dissolved tests	☐Yes ☐No ☒N/A	11.
Sample Labels match COC:	☒Yes ☐No ☐N/A	12.
-Includes date/time/ID/Analysis Matrix: SL		
All containers needing acid/base preservation have been checked. Noncompliance are noted in 13.	☐Yes ☐No ☒N/A	13. ☐ HNO3 ☐ H2SO4 ☐ NaOH ☐ HCl Samp #
All containers needing preservation are found to be in compliance with EPA recommendation.	☐Yes ☐No ☒N/A	
Exceptions: VOA,Coliform, TOC, Oil and Grease, WI-DRO (water)	☐Yes ☑No	Initial when completed / Lot # of added preservative
Samples checked for dechlorination:	☐Yes ☐No ☒N/A	14.
Headspace in VOA Vials (>6mm):	☐Yes ☐No ☒N/A	15.
Trip Blank Present:	☐Yes ☒No ☐N/A	16.
Trip Blank Custody Seals Present	☐Yes ☐No ☒N/A	
Pace Trip Blank Lot # (if purchased): NA		

Client Notification/ Resolution: Field Data Required? Y / N

Person Contacted: _____ Date/Time: _____

Comments/ Resolution: _____

Project Manager Review: _____ **Date:** 7/14/11

Note: Whenever there is a discrepancy affecting North Carolina compliance samples, a copy of this form will be sent to the North Carolina DEHNR Certification Office (i.e out of hold, incorrect preservative, out of temp, incorrect containers)

Pace Analytical Services, Inc.
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October 13, 2011

Kevin Houck
Herrera Environmental Consultants
101 East Broadway, Suite 610
Missoula, MT 59802

RE: Project: BlackPine Mine REV
Pace Project No.: 10163437

Dear Kevin Houck:
Enclosed are the analytical results for sample(s) received by the laboratory on July 15, 2011. The results relate only to the samples included in this report.

This report has been revised to add Cobalt and delete Silver.

If you have any questions concerning this report, please feel free to contact me.

Sincerely,

Carol Davy for
Sally Heinje
sally.heinje@pacelabs.com
Project Manager

Enclosures

cc: Devin Clary, Montana Dept. of Environmental Quality
Mark Donner, Trihydro
Jamie Mongoven, Montana Dept. of Environmental

REPORT OF LABORATORY ANALYSIS

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CERTIFICATIONS

Project: BlackPine Mine REV
Pace Project No.: 10163437

Minnesota Certification IDs

1700 Elm Street SE Suite 200, Minneapolis, MN 55414
A2LA Certification #: 2926.01
Alaska Certification #: UST-078
Alaska Certification #MN00064
Arizona Certification #: AZ-0014
Arkansas Certification #: 88-0680
California Certification #: 01155CA
EPA Region 8 Certification #: Pace
Florida/NELAP Certification #: E87605
Georgia Certification #: 959
Idaho Certification #: MN00064
Illinois Certification #: 200011
Iowa Certification #: 368
Kansas Certification #: E-10167
Louisiana Certification #: 03086
Louisiana Certification #: LA080009
Maine Certification #: 2007029
Maryland Certification #: 322
Michigan DEQ Certification #: 9909
Minnesota Certification #: 027-053-137
Mississippi Certification #: Pace
Montana Certification #: MT CERT0092
Nevada Certification #: MN_00064
Nebraska Certification #: Pace
New Jersey Certification #: MN-002
New Mexico Certification #: Pace
New York Certification #: 11647
North Carolina Certification #: 530
North Dakota Certification #: R-036
North Dakota Certification #: R-036A
Ohio VAP Certification #: CL101
Oklahoma Certification #: D9921
Oklahoma Certification #: 9507
Oregon Certification #: MN200001
Pennsylvania Certification #: 68-00563
Puerto Rico Certification
Tennessee Certification #: 02818
Texas Certification #: T104704192
Washington Certification #: C754
Wisconsin Certification #: 999407970

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SAMPLE SUMMARY

Project: BlackPine Mine REV
Pace Project No.: 10163437

Lab ID	Sample ID	Matrix	Date Collected	Date Received
10163437001	**CML-SD-45**	Solid	07/12/11 09:15	07/15/11 09:25
10163437002	**CML-SD-43**	Solid	07/12/11 09:30	07/15/11 09:25
10163437003	**CML-SD-40**	Solid	07/12/11 09:40	07/15/11 09:25
10163437004	**CML-SD-37**	Solid	07/12/11 09:45	07/15/11 09:25
10163437005	**CML-SD-36**	Solid	07/12/11 09:55	07/15/11 09:25
10163437006	**CML-SD-34**	Solid	07/12/11 10:10	07/15/11 09:25
10163437007	**CML-SD-35**	Solid	07/12/11 10:15	07/15/11 09:25
10163437008	**CML-SD-38**	Solid	07/12/11 10:25	07/15/11 09:25
10163437009	**CML-SD-41**	Solid	07/12/11 10:35	07/15/11 09:25
10163437010	**CML-SD-44**	Solid	07/12/11 10:40	07/15/11 09:25
10163437011	**CML-SD-46**	Solid	07/12/11 10:45	07/15/11 09:25
10163437012	**CML-SD-33-00**	Solid	07/12/11 11:45	07/15/11 09:25
10163437013	**CML-SD-33-01**	Solid	07/12/11 11:55	07/15/11 09:25
10163437014	**CML-SD-32-00**	Solid	07/12/11 12:10	07/15/11 09:25
10163437015	**CML-SD-31-00**	Solid	07/12/11 12:20	07/15/11 09:25
10163437016	**CML-SD-31-02**	Solid	07/12/11 12:35	07/15/11 09:25
10163437017	**CML-SD-29-00**	Solid	07/12/11 12:50	07/15/11 09:25
10163437018	**CML-SD-28-00**	Solid	07/12/11 12:55	07/15/11 09:25
10163437019	**CML-SD-27-00**	Solid	07/12/11 14:20	07/15/11 09:25
10163437020	**CML-SD-24-00**	Solid	07/12/11 14:30	07/15/11 09:25
10163437021	**CML-SD-24-01**	Solid	07/12/11 14:35	07/15/11 09:25
10163437022	**CML-SD-25-00**	Solid	07/12/11 14:45	07/15/11 09:25
10163437023	**CML-SD-26-00**	Solid	07/12/11 14:50	07/15/11 09:25
10163437024	**CML-SD-21-00**	Solid	07/12/11 15:00	07/15/11 09:25
10163437025	**CML-SD-20-00**	Solid	07/12/11 15:05	07/15/11 09:25
10163437026	**CML-SD-20-02**	Solid	07/12/11 15:50	07/15/11 09:25
10163437027	**CML-SD-42-00**	Solid	07/13/11 08:15	07/15/11 09:25
10163437028	**CML-SD-42-02**	Solid	07/13/11 08:45	07/15/11 09:25
10163437029	**CML-SD-39-00**	Solid	07/13/11 09:00	07/15/11 09:25
10163437030	**CML-SD-30-00**	Solid	07/13/11 09:20	07/15/11 09:25
10163437031	**CML-SD-22-00**	Solid	07/13/11 09:35	07/15/11 09:25
10163437032	**CML-SD-23-00**	Solid	07/13/11 09:45	07/15/11 09:25
10163437033	**CML-SD-23-02**	Solid	07/13/11 09:50	07/15/11 09:25
10163437034	**CML-SD-19-00**	Solid	07/13/11 10:10	07/15/11 09:25
10163437035	**CML-SD-19-02**	Solid	07/13/11 10:15	07/15/11 09:25
10163437036	**CML-SD-18-00**	Solid	07/13/11 10:20	07/15/11 09:25

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SAMPLE ANALYTE COUNT

Project: BlackPine Mine REV
Pace Project No.: 10163437

Lab ID	Sample ID	Method	Analysts	Analytes Reported	Laboratory
10163437001	**CML-SD-45**	EPA 6010	IP	12	PASI-M
		EPA 7471	TEM	1	PASI-M
		% Moisture	JDL	1	PASI-M
10163437002	**CML-SD-43**	EPA 6010	IP	12	PASI-M
		EPA 7471	TEM	1	PASI-M
		% Moisture	JDL	1	PASI-M
10163437003	**CML-SD-40**	EPA 6010	IP	12	PASI-M
		EPA 7471	TEM	1	PASI-M
		% Moisture	JDL	1	PASI-M
10163437004	**CML-SD-37**	EPA 6010	IP	12	PASI-M
		EPA 7471	TEM	1	PASI-M
		% Moisture	JDL	1	PASI-M
10163437005	**CML-SD-36**	EPA 6010	IP	12	PASI-M
		EPA 7471	TEM	1	PASI-M
		% Moisture	JDL	1	PASI-M
10163437006	**CML-SD-34**	EPA 6010	IP	12	PASI-M
		EPA 7471	TEM	1	PASI-M
		% Moisture	JDL	1	PASI-M
10163437007	**CML-SD-35**	EPA 6010	IP	12	PASI-M
		EPA 7471	TEM	1	PASI-M
		% Moisture	JDL	1	PASI-M
10163437008	**CML-SD-38**	EPA 6010	IP	12	PASI-M
		EPA 7471	TEM	1	PASI-M
		% Moisture	JDL	1	PASI-M
10163437009	**CML-SD-41**	EPA 6010	IP	12	PASI-M
		EPA 7471	TEM	1	PASI-M
		% Moisture	JDL	1	PASI-M
10163437010	**CML-SD-44**	EPA 6010	IP	12	PASI-M
		EPA 7471	TEM	1	PASI-M
		% Moisture	JDL	1	PASI-M
10163437011	**CML-SD-46**	EPA 6010	IP	12	PASI-M
		EPA 7471	TEM	1	PASI-M
		% Moisture	JDL	1	PASI-M
10163437012	**CML-SD-33-00**	EPA 6010	IP	12	PASI-M
		EPA 7471	TEM	1	PASI-M
		% Moisture	JDL	1	PASI-M
10163437013	**CML-SD-33-01**	EPA 6010	IP	12	PASI-M

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SAMPLE ANALYTE COUNT

Project: BlackPine Mine REV
Pace Project No.: 10163437

Lab ID	Sample ID	Method	Analysts	Analytes Reported	Laboratory
		EPA 7471	TEM	1	PASI-M
		% Moisture	JDL	1	PASI-M
10163437014	**CML-SD-32-00**	EPA 6010	IP	12	PASI-M
		EPA 7471	TEM	1	PASI-M
		% Moisture	JDL	1	PASI-M
10163437015	**CML-SD-31-00**	EPA 6010	IP	12	PASI-M
		EPA 7471	TEM	1	PASI-M
		% Moisture	JDL	1	PASI-M
10163437016	**CML-SD-31-02**	EPA 6010	IP	12	PASI-M
		EPA 7471	TEM	1	PASI-M
		% Moisture	JDL	1	PASI-M
10163437017	**CML-SD-29-00**	EPA 6010	IP	12	PASI-M
		EPA 7471	TEM	1	PASI-M
		% Moisture	JDL	1	PASI-M
10163437018	**CML-SD-28-00**	EPA 6010	IP	12	PASI-M
		EPA 7471	TEM	1	PASI-M
		% Moisture	JDL	1	PASI-M
10163437019	**CML-SD-27-00**	EPA 6010	IP	12	PASI-M
		EPA 7471	TEM	1	PASI-M
		% Moisture	JDL	1	PASI-M
10163437020	**CML-SD-24-00**	EPA 6010	IP	12	PASI-M
		EPA 7471	TEM	1	PASI-M
		% Moisture	JDL	1	PASI-M
10163437021	**CML-SD-24-01**	EPA 6010	IP	12	PASI-M
		EPA 7471	TEM	1	PASI-M
		% Moisture	JDL	1	PASI-M
10163437022	**CML-SD-25-00**	EPA 6010	IP	12	PASI-M
		EPA 7471	TEM	1	PASI-M
		% Moisture	JDL	1	PASI-M
10163437023	**CML-SD-26-00**	EPA 6010	IP	12	PASI-M
		EPA 7471	TEM	1	PASI-M
		% Moisture	JDL	1	PASI-M
10163437024	**CML-SD-21-00**	EPA 6010	IP	12	PASI-M
		EPA 7471	TEM	1	PASI-M
		% Moisture	JDL	1	PASI-M
10163437025	**CML-SD-20-00**	EPA 6010	IP	12	PASI-M
		EPA 7471	TEM	1	PASI-M

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SAMPLE ANALYTE COUNT

Project: BlackPine Mine REV
Pace Project No.: 10163437

Lab ID	Sample ID	Method	Analysts	Analytes Reported	Laboratory
		% Moisture	JDL	1	PASI-M
10163437026	**CML-SD-20-02**	EPA 6010	IP	12	PASI-M
		EPA 7471	TEM	1	PASI-M
		% Moisture	JDL	1	PASI-M
10163437027	**CML-SD-42-00**	EPA 6010	IP	12	PASI-M
		EPA 7471	TEM	1	PASI-M
		% Moisture	JDL	1	PASI-M
10163437028	**CML-SD-42-02**	EPA 6010	IP	12	PASI-M
		EPA 7471	TEM	1	PASI-M
		% Moisture	JDL	1	PASI-M
10163437029	**CML-SD-39-00**	EPA 6010	IP	12	PASI-M
		EPA 7471	TEM	1	PASI-M
		% Moisture	JDL	1	PASI-M
10163437030	**CML-SD-30-00**	EPA 6010	IP	12	PASI-M
		EPA 7471	TEM	1	PASI-M
		% Moisture	JDL	1	PASI-M
10163437031	**CML-SD-22-00**	EPA 6010	IP	12	PASI-M
		EPA 7471	TEM	1	PASI-M
		% Moisture	JDL	1	PASI-M
10163437032	**CML-SD-23-00**	EPA 6010	IP	12	PASI-M
		EPA 7471	TEM	1	PASI-M
		% Moisture	JDL	1	PASI-M
10163437033	**CML-SD-23-02**	EPA 6010	IP	12	PASI-M
		EPA 7471	TEM	1	PASI-M
		% Moisture	JDL	1	PASI-M
10163437034	**CML-SD-19-00**	EPA 6010	IP	12	PASI-M
		EPA 7471	TEM	1	PASI-M
		% Moisture	JDL	1	PASI-M
10163437035	**CML-SD-19-02**	EPA 6010	IP	12	PASI-M
		EPA 7471	TEM	1	PASI-M
		% Moisture	JDL	1	PASI-M
10163437036	**CML-SD-18-00**	EPA 6010	IP	12	PASI-M
		EPA 7471	TEM	1	PASI-M
		% Moisture	JDL	1	PASI-M

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PROJECT NARRATIVE

Project: BlackPine Mine REV
Pace Project No.: 10163437

Method: **EPA 6010**
Description: 6010 MET ICP
Client: Montana Dept. of Environmental Quality
Date: October 13, 2011

General Information:
36 samples were analyzed for EPA 6010. All samples were received in acceptable condition with any exceptions noted below.

Hold Time:
The samples were analyzed within the method required hold times with any exceptions noted below.

Sample Preparation:
The samples were prepared in accordance with EPA 3050 with any exceptions noted below.

Initial Calibrations (including MS Tune as applicable):
All criteria were within method requirements with any exceptions noted below.

Continuing Calibration:
All criteria were within method requirements with any exceptions noted below.

Method Blank:
All analytes were below the report limit in the method blank with any exceptions noted below.

Laboratory Control Spike:
All laboratory control spike compounds were within QC limits with any exceptions noted below.

Matrix Spikes:
All percent recoveries and relative percent differences (RPDs) were within acceptance criteria with any exceptions noted below.

QC Batch: MPRP/27174

A matrix spike and matrix spike duplicate (MS/MSD) were performed on the following sample(s): 10163437001,10163437020

M1: Matrix spike recovery exceeded QC limits. Batch accepted based on laboratory control sample (LCS) recovery.

- MS (Lab ID: 1014890)
  - Antimony
  - Barium
  - Lead
  - Manganese
  - Zinc
- MS (Lab ID: 1014892)
  - Antimony
  - Barium
  - Copper
  - Lead
  - Zinc
- MSD (Lab ID: 1014891)
  - Antimony
  - Barium
  - Manganese

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PROJECT NARRATIVE

Project: BlackPine Mine REV
Pace Project No.: 10163437

Method: **EPA 6010**
Description: 6010 MET ICP
Client: Montana Dept. of Environmental Quality
Date: October 13, 2011

QC Batch: MPRP/27174

A matrix spike and matrix spike duplicate (MS/MSD) were performed on the following sample(s): 10163437001,10163437020

P6: Matrix spike recovery was outside laboratory control limits due to a parent sample concentration notably higher than the spike level.

- MS (Lab ID: 1014890)
  - Iron
- MS (Lab ID: 1014892)
  - Iron
- MSD (Lab ID: 1014891)
  - Iron

QC Batch: MPRP/27175

A matrix spike and matrix spike duplicate (MS/MSD) were performed on the following sample(s): 10163437021,10163437036

M1: Matrix spike recovery exceeded QC limits. Batch accepted based on laboratory control sample (LCS) recovery.

- MS (Lab ID: 1014895)
  - Antimony
  - Barium
  - Copper
- MS (Lab ID: 1014897)
  - Arsenic
  - Barium
  - Copper
  - Lead
  - Manganese
  - Zinc
- MSD (Lab ID: 1014896)
  - Antimony
  - Barium
  - Lead
  - Manganese
  - Zinc

P6: Matrix spike recovery was outside laboratory control limits due to a parent sample concentration notably higher than the spike level.

- MS (Lab ID: 1014895)
  - Iron
  - Manganese
- MS (Lab ID: 1014897)
  - Iron

Duplicate Sample:
All duplicate sample results were within method acceptance criteria with any exceptions noted below.

Additional Comments:

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PROJECT NARRATIVE

Project: BlackPine Mine REV
Pace Project No.: 10163437

Method: **EPA 6010**
Description: 6010 MET ICP
Client: Montana Dept. of Environmental Quality
Date: October 13, 2011

Analyte Comments:

QC Batch: MPRP/27174

- CML-SD-24-00 (Lab ID: 10163437020)
  - Iron
- CML-SD-27-00 (Lab ID: 10163437019)
  - Iron
- CML-SD-28-00 (Lab ID: 10163437018)
  - Iron
- CML-SD-29-00 (Lab ID: 10163437017)
  - Iron
- CML-SD-31-00 (Lab ID: 10163437015)
  - Iron
- CML-SD-31-02 (Lab ID: 10163437016)
  - Iron
- CML-SD-32-00 (Lab ID: 10163437014)
  - Iron
- CML-SD-33-00 (Lab ID: 10163437012)
  - Iron
- CML-SD-33-01 (Lab ID: 10163437013)
  - Iron
- CML-SD-34 (Lab ID: 10163437006)
  - Iron
- CML-SD-35 (Lab ID: 10163437007)
  - Iron
- CML-SD-36 (Lab ID: 10163437005)
  - Iron
- CML-SD-37 (Lab ID: 10163437004)
  - Iron
- CML-SD-38 (Lab ID: 10163437008)
  - Iron
- CML-SD-40 (Lab ID: 10163437003)
  - Iron
- CML-SD-41 (Lab ID: 10163437009)
  - Iron
- CML-SD-43 (Lab ID: 10163437002)
  - Iron
- CML-SD-44 (Lab ID: 10163437010)
  - Iron
- CML-SD-45 (Lab ID: 10163437001)
  - Iron
- CML-SD-46 (Lab ID: 10163437011)
  - Iron

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PROJECT NARRATIVE

Project: BlackPine Mine REV
Pace Project No.: 10163437

Method: **EPA 6010**
Description: 6010 MET ICP
Client: Montana Dept. of Environmental Quality
Date: October 13, 2011

Analyte Comments:

QC Batch: MPRP/27175

- CML-SD-18-00 (Lab ID: 10163437036)
  - Iron
- CML-SD-19-00 (Lab ID: 10163437034)
  - Iron
- CML-SD-19-02 (Lab ID: 10163437035)
  - Iron
- CML-SD-20-00 (Lab ID: 10163437025)
  - Iron
- CML-SD-20-02 (Lab ID: 10163437026)
  - Iron
- CML-SD-21-00 (Lab ID: 10163437024)
  - Iron
- CML-SD-22-00 (Lab ID: 10163437031)
  - Iron
- CML-SD-23-00 (Lab ID: 10163437032)
  - Iron
- CML-SD-23-02 (Lab ID: 10163437033)
  - Iron
- CML-SD-24-01 (Lab ID: 10163437021)
  - Iron
- CML-SD-25-00 (Lab ID: 10163437022)
  - Iron
- CML-SD-26-00 (Lab ID: 10163437023)
  - Iron
- CML-SD-30-00 (Lab ID: 10163437030)
  - Iron
- CML-SD-39-00 (Lab ID: 10163437029)
  - Iron
- CML-SD-42-00 (Lab ID: 10163437027)
  - Iron
- CML-SD-42-02 (Lab ID: 10163437028)
  - Iron

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PROJECT NARRATIVE

Project: BlackPine Mine REV
Pace Project No.: 10163437

Method: **EPA 7471**
Description: 7471 Mercury
Client: Montana Dept. of Environmental Quality
Date: October 13, 2011

General Information:
36 samples were analyzed for EPA 7471. All samples were received in acceptable condition with any exceptions noted below.

Hold Time:
The samples were analyzed within the method required hold times with any exceptions noted below.

Sample Preparation:
The samples were prepared in accordance with EPA 7471 with any exceptions noted below.

Initial Calibrations (including MS Tune as applicable):
All criteria were within method requirements with any exceptions noted below.

Continuing Calibration:
All criteria were within method requirements with any exceptions noted below.

Method Blank:
All analytes were below the report limit in the method blank with any exceptions noted below.

Laboratory Control Spike:
All laboratory control spike compounds were within QC limits with any exceptions noted below.

Matrix Spikes:
All percent recoveries and relative percent differences (RPDs) were within acceptance criteria with any exceptions noted below.

QC Batch: MERP/5638

A matrix spike and matrix spike duplicate (MS/MSD) were performed on the following sample(s): 10163437021,10163437036

M6: Matrix spike and Matrix spike duplicate recovery not evaluated against control limits due to sample dilution.

- MS (Lab ID: 1015395)
  - Mercury
- MS (Lab ID: 1024027)
  - Mercury
- MSD (Lab ID: 1024028)
  - Mercury

QC Batch: MERP/5637

A matrix spike and matrix spike duplicate (MS/MSD) were performed on the following sample(s): 10163437001,10163437020

M6: Matrix spike and Matrix spike duplicate recovery not evaluated against control limits due to sample dilution.

- MS (Lab ID: 1015386)
  - Mercury
- MS (Lab ID: 1015388)
  - Mercury
- MSD (Lab ID: 1015387)
  - Mercury

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PROJECT NARRATIVE

Project: BlackPine Mine REV
Pace Project No.: 10163437

Method: **EPA 7471**
Description: 7471 Mercury
Client: Montana Dept. of Environmental Quality
Date: October 13, 2011

Duplicate Sample:
All duplicate sample results were within method acceptance criteria with any exceptions noted below.

Additional Comments:

This data package has been reviewed for quality and completeness and is approved for release.

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ANALYTICAL RESULTS

Project: BlackPine Mine REV
Pace Project No.: 10163437

Sample: CML-SD-45 **Lab ID: 10163437001** Collected: 07/12/11 09:15 Received: 07/15/11 09:25 Matrix: Solid

Results reported on a "dry-weight" basis

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
6010 MET ICP	Analytical Method: EPA 6010 Preparation Method: EPA 3050							
Antimony	**2.8**	mg/kg	2.5	5	07/29/11 13:53	08/01/11 17:31	7440-36-0	M1
Arsenic	**7.8**	mg/kg	2.5	5	07/29/11 13:53	08/01/11 17:31	7440-38-2	
Barium	**285**	mg/kg	2.5	5	07/29/11 13:53	08/01/11 17:31	7440-39-3	M1
Cadmium	**1.1**	mg/kg	0.25	5	07/29/11 13:53	08/01/11 17:31	7440-43-9	
Chromium	**8.4**	mg/kg	2.5	5	07/29/11 13:53	08/01/11 17:31	7440-47-3	
Cobalt	**7.7**	mg/kg	2.5	5	07/29/11 13:53	08/01/11 17:31	7440-48-4	
Copper	**42.5**	mg/kg	2.5	5	07/29/11 13:53	08/01/11 17:31	7440-50-8	
Iron	**9690**	mg/kg	12.7	5	07/29/11 13:53	08/01/11 17:31	7439-89-6	P6
Lead	**37.5**	mg/kg	1.5	5	07/29/11 13:53	08/01/11 17:31	7439-92-1	M1
Manganese	**739**	mg/kg	1.3	5	07/29/11 13:53	08/01/11 17:31	7439-96-5	M1
Nickel	**11.0**	mg/kg	5.1	5	07/29/11 13:53	08/01/11 17:31	7440-02-0	
Zinc	**78.3**	mg/kg	5.1	5	07/29/11 13:53	08/01/11 17:31	7440-66-6	M1
7471 Mercury	Analytical Method: EPA 7471 Preparation Method: EPA 7471							
Mercury	**1.1**	mg/kg	0.26	10	08/03/11 07:58	08/04/11 07:20	7439-97-6	M6
Dry Weight	Analytical Method: % Moisture							
Percent Moisture	**25.4**	%	0.10	1		07/25/11 00:00		

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ANALYTICAL RESULTS

Project: BlackPine Mine REV
Pace Project No.: 10163437

Sample: CML-SD-43 **Lab ID: 10163437002** Collected: 07/12/11 09:30 Received: 07/15/11 09:25 Matrix: Solid

Results reported on a "dry-weight" basis

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
6010 MET ICP	Analytical Method: EPA 6010 Preparation Method: EPA 3050							
Antimony	**20.0**	mg/kg	3.1	5	07/29/11 13:53	08/01/11 17:48	7440-36-0	
Arsenic	**32.9**	mg/kg	3.1	5	07/29/11 13:53	08/01/11 17:48	7440-38-2	
Barium	**485**	mg/kg	3.1	5	07/29/11 13:53	08/01/11 17:48	7440-39-3	
Cadmium	**4.2**	mg/kg	0.31	5	07/29/11 13:53	08/01/11 17:48	7440-43-9	
Chromium	**10.9**	mg/kg	3.1	5	07/29/11 13:53	08/01/11 17:48	7440-47-3	
Cobalt	**8.3**	mg/kg	3.1	5	07/29/11 13:53	08/01/11 17:48	7440-48-4	
Copper	**131**	mg/kg	3.1	5	07/29/11 13:53	08/01/11 17:48	7440-50-8	
Iron	**13100**	mg/kg	15.4	5	07/29/11 13:53	08/01/11 17:48	7439-89-6	
Lead	**136**	mg/kg	1.8	5	07/29/11 13:53	08/01/11 17:48	7439-92-1	
Manganese	**936**	mg/kg	1.5	5	07/29/11 13:53	08/01/11 17:48	7439-96-5	
Nickel	**12.7**	mg/kg	6.1	5	07/29/11 13:53	08/01/11 17:48	7440-02-0	
Zinc	**211**	mg/kg	6.1	5	07/29/11 13:53	08/01/11 17:48	7440-66-6	
7471 Mercury	Analytical Method: EPA 7471 Preparation Method: EPA 7471							
Mercury	**3.3**	mg/kg	0.29	10	08/03/11 07:58	08/04/11 07:31	7439-97-6	
Dry Weight	Analytical Method: % Moisture							
Percent Moisture	**30.5**	%	0.10	1		07/25/11 00:00		

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ANALYTICAL RESULTS

Project: BlackPine Mine REV
Pace Project No.: 10163437

Sample: CML-SD-40 **Lab ID: 10163437003** Collected: 07/12/11 09:40 Received: 07/15/11 09:25 Matrix: Solid

Results reported on a "dry-weight" basis

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
6010 MET ICP	Analytical Method: EPA 6010 Preparation Method: EPA 3050							
Antimony	**11.1**	mg/kg	3.0	5	07/29/11 13:53	08/01/11 18:03	7440-36-0	
Arsenic	**16.5**	mg/kg	3.0	5	07/29/11 13:53	08/01/11 18:03	7440-38-2	
Barium	**437**	mg/kg	3.0	5	07/29/11 13:53	08/01/11 18:03	7440-39-3	
Cadmium	**1.6**	mg/kg	0.30	5	07/29/11 13:53	08/01/11 18:03	7440-43-9	
Chromium	**10.3**	mg/kg	3.0	5	07/29/11 13:53	08/01/11 18:03	7440-47-3	
Cobalt	**7.6**	mg/kg	3.0	5	07/29/11 13:53	08/01/11 18:03	7440-48-4	
Copper	**75.5**	mg/kg	3.0	5	07/29/11 13:53	08/01/11 18:03	7440-50-8	
Iron	**11300**	mg/kg	15.0	5	07/29/11 13:53	08/01/11 18:03	7439-89-6	
Lead	**88.0**	mg/kg	1.8	5	07/29/11 13:53	08/01/11 18:03	7439-92-1	
Manganese	**781**	mg/kg	1.5	5	07/29/11 13:53	08/01/11 18:03	7439-96-5	
Nickel	**13.9**	mg/kg	6.0	5	07/29/11 13:53	08/01/11 18:03	7440-02-0	
Zinc	**127**	mg/kg	6.0	5	07/29/11 13:53	08/01/11 18:03	7440-66-6	
7471 Mercury	Analytical Method: EPA 7471 Preparation Method: EPA 7471							
Mercury	**2.1**	mg/kg	0.35	10	08/03/11 07:58	08/04/11 07:33	7439-97-6	
Dry Weight	Analytical Method: % Moisture							
Percent Moisture	**44.3**	%	0.10	1		07/25/11 00:00		

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ANALYTICAL RESULTS

Project: BlackPine Mine REV
Pace Project No.: 10163437

Sample: CML-SD-37 **Lab ID: 10163437004** Collected: 07/12/11 09:45 Received: 07/15/11 09:25 Matrix: Solid

Results reported on a "dry-weight" basis

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
6010 MET ICP	Analytical Method: EPA 6010 Preparation Method: EPA 3050							
Antimony	**88.9**	mg/kg	2.3	5	07/29/11 13:53	08/01/11 18:08	7440-36-0	
Arsenic	**118**	mg/kg	2.3	5	07/29/11 13:53	08/01/11 18:08	7440-38-2	
Barium	**249**	mg/kg	2.3	5	07/29/11 13:53	08/01/11 18:08	7440-39-3	
Cadmium	**4.4**	mg/kg	0.23	5	07/29/11 13:53	08/01/11 18:08	7440-43-9	
Chromium	**25.8**	mg/kg	2.3	5	07/29/11 13:53	08/01/11 18:08	7440-47-3	
Cobalt	**9.9**	mg/kg	2.3	5	07/29/11 13:53	08/01/11 18:08	7440-48-4	
Copper	**276**	mg/kg	2.3	5	07/29/11 13:53	08/01/11 18:08	7440-50-8	
Iron	**36900**	mg/kg	11.3	5	07/29/11 13:53	08/01/11 18:08	7439-89-6	
Lead	**693**	mg/kg	1.4	5	07/29/11 13:53	08/01/11 18:08	7439-92-1	
Manganese	**569**	mg/kg	1.1	5	07/29/11 13:53	08/01/11 18:08	7439-96-5	
Nickel	**4.7**	mg/kg	4.5	5	07/29/11 13:53	08/01/11 18:08	7440-02-0	
Zinc	**164**	mg/kg	4.5	5	07/29/11 13:53	08/01/11 18:08	7440-66-6	
7471 Mercury	Analytical Method: EPA 7471 Preparation Method: EPA 7471							
Mercury	**8.1**	mg/kg	0.21	10	08/03/11 07:58	08/04/11 07:35	7439-97-6	
Dry Weight	Analytical Method: % Moisture							
Percent Moisture	**3.8**	%	0.10	1		07/25/11 00:00		

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ANALYTICAL RESULTS

Project: BlackPine Mine REV
Pace Project No.: 10163437

Sample: CML-SD-36 **Lab ID: 10163437005** Collected: 07/12/11 09:55 Received: 07/15/11 09:25 Matrix: Solid

Results reported on a "dry-weight" basis

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
6010 MET ICP	Analytical Method: EPA 6010 Preparation Method: EPA 3050							
Antimony	**105**	mg/kg	2.3	5	07/29/11 13:53	08/01/11 18:20	7440-36-0	
Arsenic	**125**	mg/kg	2.3	5	07/29/11 13:53	08/01/11 18:20	7440-38-2	
Barium	**259**	mg/kg	2.3	5	07/29/11 13:53	08/01/11 18:20	7440-39-3	
Cadmium	**6.2**	mg/kg	0.23	5	07/29/11 13:53	08/01/11 18:20	7440-43-9	
Chromium	**5.5**	mg/kg	2.3	5	07/29/11 13:53	08/01/11 18:20	7440-47-3	
Cobalt	**4.2**	mg/kg	2.3	5	07/29/11 13:53	08/01/11 18:20	7440-48-4	
Copper	**479**	mg/kg	2.3	5	07/29/11 13:53	08/01/11 18:20	7440-50-8	
Iron	**9620**	mg/kg	11.6	5	07/29/11 13:53	08/01/11 18:20	7439-89-6	
Lead	**769**	mg/kg	1.4	5	07/29/11 13:53	08/01/11 18:20	7439-92-1	
Manganese	**788**	mg/kg	1.2	5	07/29/11 13:53	08/01/11 18:20	7439-96-5	
Nickel	**6.5**	mg/kg	4.7	5	07/29/11 13:53	08/01/11 18:20	7440-02-0	
Zinc	**107**	mg/kg	4.7	5	07/29/11 13:53	08/01/11 18:20	7440-66-6	
7471 Mercury	Analytical Method: EPA 7471 Preparation Method: EPA 7471							
Mercury	**9.3**	mg/kg	2.5	100	08/03/11 07:58	08/04/11 07:47	7439-97-6	
Dry Weight	Analytical Method: % Moisture							
Percent Moisture	**20.5**	%	0.10	1		07/25/11 00:00		

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ANALYTICAL RESULTS

Project: BlackPine Mine REV
Pace Project No.: 10163437

Sample: CML-SD-34 **Lab ID: 10163437006** Collected: 07/12/11 10:10 Received: 07/15/11 09:25 Matrix: Solid

Results reported on a "dry-weight" basis

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
6010 MET ICP	Analytical Method: EPA 6010 Preparation Method: EPA 3050							
Antimony	**683**	mg/kg	5.9	5	07/29/11 13:53	08/01/11 18:26	7440-36-0	
Arsenic	**315**	mg/kg	5.9	5	07/29/11 13:53	08/01/11 18:26	7440-38-2	
Barium	**269**	mg/kg	5.9	5	07/29/11 13:53	08/01/11 18:26	7440-39-3	
Cadmium	**15.6**	mg/kg	0.59	5	07/29/11 13:53	08/01/11 18:26	7440-43-9	
Chromium	**13.6**	mg/kg	5.9	5	07/29/11 13:53	08/01/11 18:26	7440-47-3	
Cobalt	**6.9**	mg/kg	5.9	5	07/29/11 13:53	08/01/11 18:26	7440-48-4	
Copper	**2240**	mg/kg	5.9	5	07/29/11 13:53	08/01/11 18:26	7440-50-8	
Iron	**18800**	mg/kg	29.6	5	07/29/11 13:53	08/01/11 18:26	7439-89-6	
Lead	**2840**	mg/kg	3.6	5	07/29/11 13:53	08/01/11 18:26	7439-92-1	
Manganese	**165**	mg/kg	3.0	5	07/29/11 13:53	08/01/11 18:26	7439-96-5	
Nickel	**<11.9**	mg/kg	11.9	5	07/29/11 13:53	08/01/11 18:26	7440-02-0	
Zinc	**333**	mg/kg	11.9	5	07/29/11 13:53	08/01/11 18:26	7440-66-6	
7471 Mercury	Analytical Method: EPA 7471 Preparation Method: EPA 7471							
Mercury	**55.4**	mg/kg	5.4	100	08/03/11 07:58	08/04/11 07:54	7439-97-6	
Dry Weight	Analytical Method: % Moisture							
Percent Moisture	**62.7**	%	0.10	1		07/25/11 00:00		

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ANALYTICAL RESULTS

Project: BlackPine Mine REV
Pace Project No.: 10163437

Sample: CML-SD-35 **Lab ID: 10163437007** Collected: 07/12/11 10:15 Received: 07/15/11 09:25 Matrix: Solid

Results reported on a "dry-weight" basis

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
6010 MET ICP	Analytical Method: EPA 6010 Preparation Method: EPA 3050							
Antimony	**293**	mg/kg	2.6	5	07/29/11 13:53	08/01/11 18:31	7440-36-0	
Arsenic	**305**	mg/kg	2.6	5	07/29/11 13:53	08/01/11 18:31	7440-38-2	
Barium	**271**	mg/kg	2.6	5	07/29/11 13:53	08/01/11 18:31	7440-39-3	
Cadmium	**12.9**	mg/kg	0.26	5	07/29/11 13:53	08/01/11 18:31	7440-43-9	
Chromium	**9.8**	mg/kg	2.6	5	07/29/11 13:53	08/01/11 18:31	7440-47-3	
Cobalt	**5.4**	mg/kg	2.6	5	07/29/11 13:53	08/01/11 18:31	7440-48-4	
Copper	**1740**	mg/kg	2.6	5	07/29/11 13:53	08/01/11 18:31	7440-50-8	
Iron	**22100**	mg/kg	13.1	5	07/29/11 13:53	08/01/11 18:31	7439-89-6	
Lead	**2200**	mg/kg	1.6	5	07/29/11 13:53	08/01/11 18:31	7439-92-1	
Manganese	**666**	mg/kg	1.3	5	07/29/11 13:53	08/01/11 18:31	7439-96-5	
Nickel	**7.5**	mg/kg	5.2	5	07/29/11 13:53	08/01/11 18:31	7440-02-0	
Zinc	**344**	mg/kg	5.2	5	07/29/11 13:53	08/01/11 18:31	7440-66-6	
7471 Mercury	Analytical Method: EPA 7471 Preparation Method: EPA 7471							
Mercury	**57.9**	mg/kg	2.7	100	08/03/11 07:58	08/04/11 08:02	7439-97-6	
Dry Weight	Analytical Method: % Moisture							
Percent Moisture	**27.0**	%	0.10	1		07/25/11 00:00		

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ANALYTICAL RESULTS

Project: BlackPine Mine REV
Pace Project No.: 10163437

Sample: CML-SD-38 **Lab ID: 10163437008** Collected: 07/12/11 10:25 Received: 07/15/11 09:25 Matrix: Solid

Results reported on a "dry-weight" basis

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
6010 MET ICP	Analytical Method: EPA 6010 Preparation Method: EPA 3050							
Antimony	**69.3**	mg/kg	2.7	5	07/29/11 13:53	08/01/11 18:38	7440-36-0	
Arsenic	**101**	mg/kg	2.7	5	07/29/11 13:53	08/01/11 18:38	7440-38-2	
Barium	**284**	mg/kg	2.7	5	07/29/11 13:53	08/01/11 18:38	7440-39-3	
Cadmium	**4.4**	mg/kg	0.27	5	07/29/11 13:53	08/01/11 18:38	7440-43-9	
Chromium	**10.3**	mg/kg	2.7	5	07/29/11 13:53	08/01/11 18:38	7440-47-3	
Cobalt	**6.2**	mg/kg	2.7	5	07/29/11 13:53	08/01/11 18:38	7440-48-4	
Copper	**375**	mg/kg	2.7	5	07/29/11 13:53	08/01/11 18:38	7440-50-8	
Iron	**16400**	mg/kg	13.3	5	07/29/11 13:53	08/01/11 18:38	7439-89-6	
Lead	**518**	mg/kg	1.6	5	07/29/11 13:53	08/01/11 18:38	7439-92-1	
Manganese	**1300**	mg/kg	1.3	5	07/29/11 13:53	08/01/11 18:38	7439-96-5	
Nickel	**7.1**	mg/kg	5.3	5	07/29/11 13:53	08/01/11 18:38	7440-02-0	
Zinc	**134**	mg/kg	5.3	5	07/29/11 13:53	08/01/11 18:38	7440-66-6	
7471 Mercury	Analytical Method: EPA 7471 Preparation Method: EPA 7471							
Mercury	**9.7**	mg/kg	2.3	100	08/03/11 07:58	08/04/11 08:09	7439-97-6	
Dry Weight	Analytical Method: % Moisture							
Percent Moisture	**15.8**	%	0.10	1		07/25/11 00:00		

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ANALYTICAL RESULTS

Project: BlackPine Mine REV
Pace Project No.: 10163437

Sample: CML-SD-41 **Lab ID: 10163437009** Collected: 07/12/11 10:35 Received: 07/15/11 09:25 Matrix: Solid

Results reported on a "dry-weight" basis

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
6010 MET ICP	Analytical Method: EPA 6010 Preparation Method: EPA 3050							
Antimony	**239**	mg/kg	2.5	5	07/29/11 13:53	08/01/11 18:45	7440-36-0	
Arsenic	**270**	mg/kg	2.5	5	07/29/11 13:53	08/01/11 18:45	7440-38-2	
Barium	**191**	mg/kg	2.5	5	07/29/11 13:53	08/01/11 18:45	7440-39-3	
Cadmium	**13.1**	mg/kg	0.25	5	07/29/11 13:53	08/01/11 18:45	7440-43-9	
Chromium	**8.9**	mg/kg	2.5	5	07/29/11 13:53	08/01/11 18:45	7440-47-3	
Cobalt	**3.4**	mg/kg	2.5	5	07/29/11 13:53	08/01/11 18:45	7440-48-4	
Copper	**653**	mg/kg	2.5	5	07/29/11 13:53	08/01/11 18:45	7440-50-8	
Iron	**24900**	mg/kg	12.5	5	07/29/11 13:53	08/01/11 18:45	7439-89-6	
Lead	**1570**	mg/kg	1.5	5	07/29/11 13:53	08/01/11 18:45	7439-92-1	
Manganese	**485**	mg/kg	1.3	5	07/29/11 13:53	08/01/11 18:45	7439-96-5	
Nickel	**<5.0**	mg/kg	5.0	5	07/29/11 13:53	08/01/11 18:45	7440-02-0	
Zinc	**170**	mg/kg	5.0	5	07/29/11 13:53	08/01/11 18:45	7440-66-6	
7471 Mercury	Analytical Method: EPA 7471 Preparation Method: EPA 7471							
Mercury	**5.4**	mg/kg	0.21	10	08/03/11 07:58	08/04/11 08:24	7439-97-6	
Dry Weight	Analytical Method: % Moisture							
Percent Moisture	**9.3**	%	0.10	1		07/25/11 00:00		

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ANALYTICAL RESULTS

Project: BlackPine Mine REV
Pace Project No.: 10163437

Sample: CML-SD-44 **Lab ID: 10163437010** Collected: 07/12/11 10:40 Received: 07/15/11 09:25 Matrix: Solid

Results reported on a "dry-weight" basis

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
6010 MET ICP	Analytical Method: EPA 6010 Preparation Method: EPA 3050							
Antimony	**7.9**	mg/kg	3.3	5	07/29/11 13:53	08/01/11 18:51	7440-36-0	
Arsenic	**29.5**	mg/kg	3.3	5	07/29/11 13:53	08/01/11 18:51	7440-38-2	
Barium	**437**	mg/kg	3.3	5	07/29/11 13:53	08/01/11 18:51	7440-39-3	
Cadmium	**1.3**	mg/kg	0.33	5	07/29/11 13:53	08/01/11 18:51	7440-43-9	
Chromium	**23.9**	mg/kg	3.3	5	07/29/11 13:53	08/01/11 18:51	7440-47-3	
Cobalt	**7.8**	mg/kg	3.3	5	07/29/11 13:53	08/01/11 18:51	7440-48-4	
Copper	**97.9**	mg/kg	3.3	5	07/29/11 13:53	08/01/11 18:51	7440-50-8	
Iron	**37400**	mg/kg	16.5	5	07/29/11 13:53	08/01/11 18:51	7439-89-6	
Lead	**168**	mg/kg	2.0	5	07/29/11 13:53	08/01/11 18:51	7439-92-1	
Manganese	**160**	mg/kg	1.7	5	07/29/11 13:53	08/01/11 18:51	7439-96-5	
Nickel	**19.2**	mg/kg	6.6	5	07/29/11 13:53	08/01/11 18:51	7440-02-0	
Zinc	**202**	mg/kg	6.6	5	07/29/11 13:53	08/01/11 18:51	7440-66-6	
7471 Mercury	Analytical Method: EPA 7471 Preparation Method: EPA 7471							
Mercury	**6.9**	mg/kg	0.32	10	08/03/11 07:58	08/04/11 08:26	7439-97-6	
Dry Weight	Analytical Method: % Moisture							
Percent Moisture	**38.4**	%	0.10	1		07/25/11 00:00		

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ANALYTICAL RESULTS

Project: BlackPine Mine REV
Pace Project No.: 10163437

Sample: CML-SD-46 **Lab ID: 10163437011** Collected: 07/12/11 10:45 Received: 07/15/11 09:25 Matrix: Solid

Results reported on a "dry-weight" basis

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
6010 MET ICP	Analytical Method: EPA 6010 Preparation Method: EPA 3050							
Antimony	**8.0**	mg/kg	4.9	5	07/29/11 13:53	08/01/11 18:57	7440-36-0	
Arsenic	**10.5**	mg/kg	4.9	5	07/29/11 13:53	08/01/11 18:57	7440-38-2	
Barium	**489**	mg/kg	4.9	5	07/29/11 13:53	08/01/11 18:57	7440-39-3	
Cadmium	**1.5**	mg/kg	0.49	5	07/29/11 13:53	08/01/11 18:57	7440-43-9	
Chromium	**24.2**	mg/kg	4.9	5	07/29/11 13:53	08/01/11 18:57	7440-47-3	
Cobalt	**6.4**	mg/kg	4.9	5	07/29/11 13:53	08/01/11 18:57	7440-48-4	
Copper	**68.9**	mg/kg	4.9	5	07/29/11 13:53	08/01/11 18:57	7440-50-8	
Iron	**25900**	mg/kg	24.6	5	07/29/11 13:53	08/01/11 18:57	7439-89-6	
Lead	**55.0**	mg/kg	3.0	5	07/29/11 13:53	08/01/11 18:57	7439-92-1	
Manganese	**183**	mg/kg	2.5	5	07/29/11 13:53	08/01/11 18:57	7439-96-5	
Nickel	**25.4**	mg/kg	9.9	5	07/29/11 13:53	08/01/11 18:57	7440-02-0	
Zinc	**227**	mg/kg	9.9	5	07/29/11 13:53	08/01/11 18:57	7440-66-6	
7471 Mercury	Analytical Method: EPA 7471 Preparation Method: EPA 7471							
Mercury	**12.7**	mg/kg	0.48	10	08/03/11 07:58	08/04/11 08:28	7439-97-6	
Dry Weight	Analytical Method: % Moisture							
Percent Moisture	**60.7**	%	0.10	1		07/25/11 00:00		

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ANALYTICAL RESULTS

Project: BlackPine Mine REV
Pace Project No.: 10163437

Sample: CML-SD-33-00 **Lab ID: 10163437012** Collected: 07/12/11 11:45 Received: 07/15/11 09:25 Matrix: Solid

Results reported on a "dry-weight" basis

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
6010 MET ICP	Analytical Method: EPA 6010 Preparation Method: EPA 3050							
Antimony	**159**	mg/kg	2.6	5	07/29/11 13:53	08/01/11 19:03	7440-36-0	
Arsenic	**155**	mg/kg	2.6	5	07/29/11 13:53	08/01/11 19:03	7440-38-2	
Barium	**448**	mg/kg	2.6	5	07/29/11 13:53	08/01/11 19:03	7440-39-3	
Cadmium	**9.0**	mg/kg	0.26	5	07/29/11 13:53	08/01/11 19:03	7440-43-9	
Chromium	**11.4**	mg/kg	2.6	5	07/29/11 13:53	08/01/11 19:03	7440-47-3	
Cobalt	**3.5**	mg/kg	2.6	5	07/29/11 13:53	08/01/11 19:03	7440-48-4	
Copper	**1260**	mg/kg	2.6	5	07/29/11 13:53	08/01/11 19:03	7440-50-8	
Iron	**13400**	mg/kg	12.9	5	07/29/11 13:53	08/01/11 19:03	7439-89-6	
Lead	**925**	mg/kg	1.6	5	07/29/11 13:53	08/01/11 19:03	7439-92-1	
Manganese	**127**	mg/kg	1.3	5	07/29/11 13:53	08/01/11 19:03	7439-96-5	
Nickel	**7.2**	mg/kg	5.2	5	07/29/11 13:53	08/01/11 19:03	7440-02-0	
Zinc	**200**	mg/kg	5.2	5	07/29/11 13:53	08/01/11 19:03	7440-66-6	
7471 Mercury	Analytical Method: EPA 7471 Preparation Method: EPA 7471							
Mercury	**4.3**	mg/kg	0.22	10	08/03/11 07:58	08/04/11 08:30	7439-97-6	
Dry Weight	Analytical Method: % Moisture							
Percent Moisture	**15.9**	%	0.10	1		07/25/11 00:00		

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ANALYTICAL RESULTS

Project: BlackPine Mine REV
Pace Project No.: 10163437

Sample: CML-SD-33-01 **Lab ID: 10163437013** Collected: 07/12/11 11:55 Received: 07/15/11 09:25 Matrix: Solid

Results reported on a "dry-weight" basis

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
6010 MET ICP	Analytical Method: EPA 6010 Preparation Method: EPA 3050							
Antimony	**511**	mg/kg	2.3	5	07/29/11 13:53	08/01/11 19:10	7440-36-0	
Arsenic	**527**	mg/kg	2.3	5	07/29/11 13:53	08/01/11 19:10	7440-38-2	
Barium	**210**	mg/kg	2.3	5	07/29/11 13:53	08/01/11 19:10	7440-39-3	
Cadmium	**20.6**	mg/kg	0.23	5	07/29/11 13:53	08/01/11 19:10	7440-43-9	
Chromium	**3.1**	mg/kg	2.3	5	07/29/11 13:53	08/01/11 19:10	7440-47-3	
Cobalt	**<2.3**	mg/kg	2.3	5	07/29/11 13:53	08/01/11 19:10	7440-48-4	
Copper	**1420**	mg/kg	2.3	5	07/29/11 13:53	08/01/11 19:10	7440-50-8	
Iron	**14200**	mg/kg	11.7	5	07/29/11 13:53	08/01/11 19:10	7439-89-6	
Lead	**2940**	mg/kg	1.4	5	07/29/11 13:53	08/01/11 19:10	7439-92-1	
Manganese	**163**	mg/kg	1.2	5	07/29/11 13:53	08/01/11 19:10	7439-96-5	
Nickel	**<4.7**	mg/kg	4.7	5	07/29/11 13:53	08/01/11 19:10	7440-02-0	
Zinc	**260**	mg/kg	4.7	5	07/29/11 13:53	08/01/11 19:10	7440-66-6	
7471 Mercury	Analytical Method: EPA 7471 Preparation Method: EPA 7471							
Mercury	**1.1**	mg/kg	0.22	10	08/03/11 07:58	08/04/11 08:36	7439-97-6	
Dry Weight	Analytical Method: % Moisture							
Percent Moisture	**10.1**	%	0.10	1		07/25/11 00:00		

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ANALYTICAL RESULTS

Project: BlackPine Mine REV
Pace Project No.: 10163437

Sample: CML-SD-32-00 **Lab ID: 10163437014** Collected: 07/12/11 12:10 Received: 07/15/11 09:25 Matrix: Solid

Results reported on a "dry-weight" basis

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
6010 MET ICP	Analytical Method: EPA 6010 Preparation Method: EPA 3050							
Antimony	**463**	mg/kg	2.6	5	07/29/11 13:53	08/01/11 19:24	7440-36-0	
Arsenic	**449**	mg/kg	2.6	5	07/29/11 13:53	08/01/11 19:24	7440-38-2	
Barium	**421**	mg/kg	2.6	5	07/29/11 13:53	08/01/11 19:24	7440-39-3	
Cadmium	**16.0**	mg/kg	0.26	5	07/29/11 13:53	08/01/11 19:24	7440-43-9	
Chromium	**7.9**	mg/kg	2.6	5	07/29/11 13:53	08/01/11 19:24	7440-47-3	
Cobalt	**5.2**	mg/kg	2.6	5	07/29/11 13:53	08/01/11 19:24	7440-48-4	
Copper	**921**	mg/kg	2.6	5	07/29/11 13:53	08/01/11 19:24	7440-50-8	
Iron	**19300**	mg/kg	13.2	5	07/29/11 13:53	08/01/11 19:24	7439-89-6	
Lead	**2470**	mg/kg	1.6	5	07/29/11 13:53	08/01/11 19:24	7439-92-1	
Manganese	**558**	mg/kg	1.3	5	07/29/11 13:53	08/01/11 19:24	7439-96-5	
Nickel	**7.2**	mg/kg	5.3	5	07/29/11 13:53	08/01/11 19:24	7440-02-0	
Zinc	**387**	mg/kg	5.3	5	07/29/11 13:53	08/01/11 19:24	7440-66-6	
7471 Mercury	Analytical Method: EPA 7471 Preparation Method: EPA 7471							
Mercury	**10.9**	mg/kg	2.5	100	08/03/11 07:58	08/04/11 08:43	7439-97-6	
Dry Weight	Analytical Method: % Moisture							
Percent Moisture	**29.7**	%	0.10	1		07/25/11 00:00		

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ANALYTICAL RESULTS

Project: BlackPine Mine REV
Pace Project No.: 10163437

Sample: CML-SD-31-00 **Lab ID: 10163437015** Collected: 07/12/11 12:20 Received: 07/15/11 09:25 Matrix: Solid

Results reported on a "dry-weight" basis

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
6010 MET ICP	Analytical Method: EPA 6010 Preparation Method: EPA 3050							
Antimony	**272**	mg/kg	2.2	5	07/29/11 13:53	08/01/11 19:31	7440-36-0	
Arsenic	**301**	mg/kg	2.2	5	07/29/11 13:53	08/01/11 19:31	7440-38-2	
Barium	**451**	mg/kg	2.2	5	07/29/11 13:53	08/01/11 19:31	7440-39-3	
Cadmium	**13.5**	mg/kg	0.22	5	07/29/11 13:53	08/01/11 19:31	7440-43-9	
Chromium	**11.7**	mg/kg	2.2	5	07/29/11 13:53	08/01/11 19:31	7440-47-3	
Cobalt	**15.5**	mg/kg	2.2	5	07/29/11 13:53	08/01/11 19:31	7440-48-4	
Copper	**2950**	mg/kg	2.2	5	07/29/11 13:53	08/01/11 19:31	7440-50-8	
Iron	**22600**	mg/kg	10.8	5	07/29/11 13:53	08/01/11 19:31	7439-89-6	
Lead	**1350**	mg/kg	1.3	5	07/29/11 13:53	08/01/11 19:31	7439-92-1	
Manganese	**1040**	mg/kg	1.1	5	07/29/11 13:53	08/01/11 19:31	7439-96-5	
Nickel	**9.5**	mg/kg	4.3	5	07/29/11 13:53	08/01/11 19:31	7440-02-0	
Zinc	**370**	mg/kg	4.3	5	07/29/11 13:53	08/01/11 19:31	7440-66-6	
7471 Mercury	Analytical Method: EPA 7471 Preparation Method: EPA 7471							
Mercury	**2.1**	mg/kg	0.22	10	08/03/11 07:58	08/04/11 08:46	7439-97-6	
Dry Weight	Analytical Method: % Moisture							
Percent Moisture	**14.2**	%	0.10	1		07/25/11 00:00		

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ANALYTICAL RESULTS

Project: BlackPine Mine REV
Pace Project No.: 10163437

Sample: CML-SD-31-02 **Lab ID: 10163437016** Collected: 07/12/11 12:35 Received: 07/15/11 09:25 Matrix: Solid

Results reported on a "dry-weight" basis

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
6010 MET ICP	Analytical Method: EPA 6010 Preparation Method: EPA 3050							
Antimony	**406**	mg/kg	2.6	5	07/29/11 13:53	08/01/11 19:37	7440-36-0	
Arsenic	**382**	mg/kg	2.6	5	07/29/11 13:53	08/01/11 19:37	7440-38-2	
Barium	**296**	mg/kg	2.6	5	07/29/11 13:53	08/01/11 19:37	7440-39-3	
Cadmium	**17.9**	mg/kg	0.26	5	07/29/11 13:53	08/01/11 19:37	7440-43-9	
Chromium	**8.3**	mg/kg	2.6	5	07/29/11 13:53	08/01/11 19:37	7440-47-3	
Cobalt	**18.8**	mg/kg	2.6	5	07/29/11 13:53	08/01/11 19:37	7440-48-4	
Copper	**1950**	mg/kg	2.6	5	07/29/11 13:53	08/01/11 19:37	7440-50-8	
Iron	**18900**	mg/kg	13.0	5	07/29/11 13:53	08/01/11 19:37	7439-89-6	
Lead	**2350**	mg/kg	1.6	5	07/29/11 13:53	08/01/11 19:37	7439-92-1	
Manganese	**1190**	mg/kg	1.3	5	07/29/11 13:53	08/01/11 19:37	7439-96-5	
Nickel	**10.4**	mg/kg	5.2	5	07/29/11 13:53	08/01/11 19:37	7440-02-0	
Zinc	**246**	mg/kg	5.2	5	07/29/11 13:53	08/01/11 19:37	7440-66-6	
7471 Mercury	Analytical Method: EPA 7471 Preparation Method: EPA 7471							
Mercury	**3.8**	mg/kg	0.23	10	08/03/11 07:58	08/04/11 08:48	7439-97-6	
Dry Weight	Analytical Method: % Moisture							
Percent Moisture	**22.2**	%	0.10	1		07/25/11 00:00		

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ANALYTICAL RESULTS

Project: BlackPine Mine REV
Pace Project No.: 10163437

Sample: CML-SD-29-00 **Lab ID: 10163437017** Collected: 07/12/11 12:50 Received: 07/15/11 09:25 Matrix: Solid

Results reported on a "dry-weight" basis

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
6010 MET ICP	Analytical Method: EPA 6010 Preparation Method: EPA 3050							
Antimony	**706**	mg/kg	2.4	5	07/29/11 13:53	08/01/11 19:44	7440-36-0	
Arsenic	**630**	mg/kg	2.4	5	07/29/11 13:53	08/01/11 19:44	7440-38-2	
Barium	**359**	mg/kg	2.4	5	07/29/11 13:53	08/01/11 19:44	7440-39-3	
Cadmium	**27.6**	mg/kg	0.24	5	07/29/11 13:53	08/01/11 19:44	7440-43-9	
Chromium	**3.7**	mg/kg	2.4	5	07/29/11 13:53	08/01/11 19:44	7440-47-3	
Cobalt	**3.1**	mg/kg	2.4	5	07/29/11 13:53	08/01/11 19:44	7440-48-4	
Copper	**2060**	mg/kg	2.4	5	07/29/11 13:53	08/01/11 19:44	7440-50-8	
Iron	**17300**	mg/kg	12.2	5	07/29/11 13:53	08/01/11 19:44	7439-89-6	
Lead	**3890**	mg/kg	1.5	5	07/29/11 13:53	08/01/11 19:44	7439-92-1	
Manganese	**352**	mg/kg	1.2	5	07/29/11 13:53	08/01/11 19:44	7439-96-5	
Nickel	**<4.9**	mg/kg	4.9	5	07/29/11 13:53	08/01/11 19:44	7440-02-0	
Zinc	**359**	mg/kg	4.9	5	07/29/11 13:53	08/01/11 19:44	7440-66-6	
7471 Mercury	Analytical Method: EPA 7471 Preparation Method: EPA 7471							
Mercury	**4.1**	mg/kg	0.21	10	08/03/11 07:58	08/04/11 08:50	7439-97-6	
Dry Weight	Analytical Method: % Moisture							
Percent Moisture	**6.0**	%	0.10	1		07/25/11 00:00		

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ANALYTICAL RESULTS

Project: BlackPine Mine REV
Pace Project No.: 10163437

Sample: CML-SD-28-00 **Lab ID: 10163437018** Collected: 07/12/11 12:55 Received: 07/15/11 09:25 Matrix: Solid

Results reported on a "dry-weight" basis

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
6010 MET ICP	Analytical Method: EPA 6010 Preparation Method: EPA 3050							
Antimony	**248**	mg/kg	2.4	5	07/29/11 13:53	08/01/11 19:51	7440-36-0	
Arsenic	**265**	mg/kg	2.4	5	07/29/11 13:53	08/01/11 19:51	7440-38-2	
Barium	**647**	mg/kg	2.4	5	07/29/11 13:53	08/01/11 19:51	7440-39-3	
Cadmium	**15.9**	mg/kg	0.24	5	07/29/11 13:53	08/01/11 19:51	7440-43-9	
Chromium	**14.8**	mg/kg	2.4	5	07/29/11 13:53	08/01/11 19:51	7440-47-3	
Cobalt	**17.2**	mg/kg	2.4	5	07/29/11 13:53	08/01/11 19:51	7440-48-4	
Copper	**1690**	mg/kg	2.4	5	07/29/11 13:53	08/01/11 19:51	7440-50-8	
Iron	**23500**	mg/kg	12.0	5	07/29/11 13:53	08/01/11 19:51	7439-89-6	
Lead	**1440**	mg/kg	1.4	5	07/29/11 13:53	08/01/11 19:51	7439-92-1	
Manganese	**1070**	mg/kg	1.2	5	07/29/11 13:53	08/01/11 19:51	7439-96-5	
Nickel	**18.3**	mg/kg	4.8	5	07/29/11 13:53	08/01/11 19:51	7440-02-0	
Zinc	**343**	mg/kg	4.8	5	07/29/11 13:53	08/01/11 19:51	7440-66-6	
7471 Mercury	Analytical Method: EPA 7471 Preparation Method: EPA 7471							
Mercury	**22.1**	mg/kg	2.4	100	08/03/11 07:58	08/04/11 08:57	7439-97-6	
Dry Weight	Analytical Method: % Moisture							
Percent Moisture	**18.0**	%	0.10	1		07/25/11 00:00		

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ANALYTICAL RESULTS

Project: BlackPine Mine REV
Pace Project No.: 10163437

Sample: CML-SD-27-00 **Lab ID: 10163437019** Collected: 07/12/11 14:20 Received: 07/15/11 09:25 Matrix: Solid

Results reported on a "dry-weight" basis

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
6010 MET ICP	Analytical Method: EPA 6010 Preparation Method: EPA 3050							
Antimony	**172**	mg/kg	1.9	5	07/29/11 13:53	08/01/11 19:57	7440-36-0	
Arsenic	**176**	mg/kg	1.9	5	07/29/11 13:53	08/01/11 19:57	7440-38-2	
Barium	**185**	mg/kg	1.9	5	07/29/11 13:53	08/01/11 19:57	7440-39-3	
Cadmium	**8.0**	mg/kg	0.19	5	07/29/11 13:53	08/01/11 19:57	7440-43-9	
Chromium	**6.6**	mg/kg	1.9	5	07/29/11 13:53	08/01/11 19:57	7440-47-3	
Cobalt	**8.0**	mg/kg	1.9	5	07/29/11 13:53	08/01/11 19:57	7440-48-4	
Copper	**1130**	mg/kg	1.9	5	07/29/11 13:53	08/01/11 19:57	7440-50-8	
Iron	**14100**	mg/kg	9.4	5	07/29/11 13:53	08/01/11 19:57	7439-89-6	
Lead	**1050**	mg/kg	1.1	5	07/29/11 13:53	08/01/11 19:57	7439-92-1	
Manganese	**790**	mg/kg	0.94	5	07/29/11 13:53	08/01/11 19:57	7439-96-5	
Nickel	**6.2**	mg/kg	3.8	5	07/29/11 13:53	08/01/11 19:57	7440-02-0	
Zinc	**175**	mg/kg	3.8	5	07/29/11 13:53	08/01/11 19:57	7440-66-6	
7471 Mercury	Analytical Method: EPA 7471 Preparation Method: EPA 7471							
Mercury	**10.4**	mg/kg	0.21	10	08/03/11 07:58	08/04/11 08:59	7439-97-6	
Dry Weight	Analytical Method: % Moisture							
Percent Moisture	**7.3**	%	0.10	1		07/25/11 00:00		

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ANALYTICAL RESULTS

Project: BlackPine Mine REV
Pace Project No.: 10163437

Sample: CML-SD-24-00 **Lab ID: 10163437020** Collected: 07/12/11 14:30 Received: 07/15/11 09:25 Matrix: Solid

Results reported on a "dry-weight" basis

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
6010 MET ICP	Analytical Method: EPA 6010 Preparation Method: EPA 3050							
Antimony	**95.0**	mg/kg	2.6	5	07/29/11 13:53	08/01/11 20:03	7440-36-0	M1
Arsenic	**109**	mg/kg	2.6	5	07/29/11 13:53	08/01/11 20:03	7440-38-2	
Barium	**371**	mg/kg	2.6	5	07/29/11 13:53	08/01/11 20:03	7440-39-3	M1
Cadmium	**6.5**	mg/kg	0.26	5	07/29/11 13:53	08/01/11 20:03	7440-43-9	
Chromium	**10.0**	mg/kg	2.6	5	07/29/11 13:53	08/01/11 20:03	7440-47-3	
Cobalt	**15.3**	mg/kg	2.6	5	07/29/11 13:53	08/01/11 20:03	7440-48-4	
Copper	**500**	mg/kg	2.6	5	07/29/11 13:53	08/01/11 20:03	7440-50-8	M1
Iron	**16500**	mg/kg	12.9	5	07/29/11 13:53	08/01/11 20:03	7439-89-6	P6
Lead	**617**	mg/kg	1.6	5	07/29/11 13:53	08/01/11 20:03	7439-92-1	M1
Manganese	**1190**	mg/kg	1.3	5	07/29/11 13:53	08/01/11 20:03	7439-96-5	
Nickel	**10.4**	mg/kg	5.2	5	07/29/11 13:53	08/01/11 20:03	7440-02-0	
Zinc	**269**	mg/kg	5.2	5	07/29/11 13:53	08/01/11 20:03	7440-66-6	M1
7471 Mercury	Analytical Method: EPA 7471 Preparation Method: EPA 7471							
Mercury	**4.9**	mg/kg	0.21	10	08/03/11 07:58	08/04/11 09:01	7439-97-6	M6
Dry Weight	Analytical Method: % Moisture							
Percent Moisture	**9.6**	%	0.10	1		07/25/11 00:00		

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ANALYTICAL RESULTS

Project: BlackPine Mine REV
Pace Project No.: 10163437

Sample: CML-SD-24-01 **Lab ID: 10163437021** Collected: 07/12/11 14:35 Received: 07/15/11 09:25 Matrix: Solid

Results reported on a "dry-weight" basis

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
6010 MET ICP	Analytical Method: EPA 6010 Preparation Method: EPA 3050							
Antimony	**24.0**	mg/kg	2.9	5	07/29/11 14:32	08/01/11 21:36	7440-36-0	M1
Arsenic	**30.5**	mg/kg	2.9	5	07/29/11 14:32	08/01/11 21:36	7440-38-2	
Barium	**425**	mg/kg	2.9	5	07/29/11 14:32	08/01/11 21:36	7440-39-3	M1
Cadmium	**13.8**	mg/kg	0.29	5	07/29/11 14:32	08/01/11 21:36	7440-43-9	
Chromium	**16.3**	mg/kg	2.9	5	07/29/11 14:32	08/01/11 21:36	7440-47-3	
Cobalt	**25.8**	mg/kg	2.9	5	07/29/11 14:32	08/01/11 21:36	7440-48-4	
Copper	**1390**	mg/kg	2.9	5	07/29/11 14:32	08/01/11 21:36	7440-50-8	M1
Iron	**23200**	mg/kg	14.7	5	07/29/11 14:32	08/01/11 21:36	7439-89-6	P6
Lead	**182**	mg/kg	1.8	5	07/29/11 14:32	08/01/11 21:36	7439-92-1	M1
Manganese	**2050**	mg/kg	1.5	5	07/29/11 14:32	08/01/11 21:36	7439-96-5	P6
Nickel	**22.5**	mg/kg	5.9	5	07/29/11 14:32	08/01/11 21:36	7440-02-0	
Zinc	**328**	mg/kg	5.9	5	07/29/11 14:32	08/01/11 21:36	7440-66-6	M1
7471 Mercury	Analytical Method: EPA 7471 Preparation Method: EPA 7471							
Mercury	**5.6**	mg/kg	0.26	10	08/01/11 09:52	08/03/11 13:23	7439-97-6	M6
Dry Weight	Analytical Method: % Moisture							
Percent Moisture	**22.6**	%	0.10	1		07/25/11 00:00		

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ANALYTICAL RESULTS

Project: BlackPine Mine REV
Pace Project No.: 10163437

Sample: CML-SD-25-00 **Lab ID: 10163437022** Collected: 07/12/11 14:45 Received: 07/15/11 09:25 Matrix: Solid

Results reported on a "dry-weight" basis

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
6010 MET ICP	Analytical Method: EPA 6010 Preparation Method: EPA 3050							
Antimony	**184**	mg/kg	2.1	5	07/29/11 14:32	08/01/11 21:55	7440-36-0	
Arsenic	**232**	mg/kg	2.1	5	07/29/11 14:32	08/01/11 21:55	7440-38-2	
Barium	**515**	mg/kg	2.1	5	07/29/11 14:32	08/01/11 21:55	7440-39-3	
Cadmium	**12.6**	mg/kg	0.21	5	07/29/11 14:32	08/01/11 21:55	7440-43-9	
Chromium	**12.1**	mg/kg	2.1	5	07/29/11 14:32	08/01/11 21:55	7440-47-3	
Cobalt	**12.9**	mg/kg	2.1	5	07/29/11 14:32	08/01/11 21:55	7440-48-4	
Copper	**837**	mg/kg	2.1	5	07/29/11 14:32	08/01/11 21:55	7440-50-8	
Iron	**19900**	mg/kg	10.5	5	07/29/11 14:32	08/01/11 21:55	7439-89-6	
Lead	**1210**	mg/kg	1.3	5	07/29/11 14:32	08/01/11 21:55	7439-92-1	
Manganese	**1210**	mg/kg	1.1	5	07/29/11 14:32	08/01/11 21:55	7439-96-5	
Nickel	**13.3**	mg/kg	4.2	5	07/29/11 14:32	08/01/11 21:55	7440-02-0	
Zinc	**326**	mg/kg	4.2	5	07/29/11 14:32	08/01/11 21:55	7440-66-6	
7471 Mercury	Analytical Method: EPA 7471 Preparation Method: EPA 7471							
Mercury	**3.5**	mg/kg	0.22	10	08/01/11 09:52	08/03/11 13:29	7439-97-6	
Dry Weight	Analytical Method: % Moisture							
Percent Moisture	**8.6**	%	0.10	1		07/25/11 00:00		

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ANALYTICAL RESULTS

Project: BlackPine Mine REV
Pace Project No.: 10163437

Sample: CML-SD-26-00 **Lab ID: 10163437023** Collected: 07/12/11 14:50 Received: 07/15/11 09:25 Matrix: Solid

Results reported on a "dry-weight" basis

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
6010 MET ICP	Analytical Method: EPA 6010 Preparation Method: EPA 3050							
Antimony	**312**	mg/kg	2.9	5	07/29/11 14:32	08/01/11 22:06	7440-36-0	
Arsenic	**291**	mg/kg	2.9	5	07/29/11 14:32	08/01/11 22:06	7440-38-2	
Barium	**185**	mg/kg	2.9	5	07/29/11 14:32	08/01/11 22:06	7440-39-3	
Cadmium	**12.3**	mg/kg	0.29	5	07/29/11 14:32	08/01/11 22:06	7440-43-9	
Chromium	**5.0**	mg/kg	2.9	5	07/29/11 14:32	08/01/11 22:06	7440-47-3	
Cobalt	**6.5**	mg/kg	2.9	5	07/29/11 14:32	08/01/11 22:06	7440-48-4	
Copper	**654**	mg/kg	2.9	5	07/29/11 14:32	08/01/11 22:06	7440-50-8	
Iron	**13600**	mg/kg	14.3	5	07/29/11 14:32	08/01/11 22:06	7439-89-6	
Lead	**1870**	mg/kg	1.7	5	07/29/11 14:32	08/01/11 22:06	7439-92-1	
Manganese	**598**	mg/kg	1.4	5	07/29/11 14:32	08/01/11 22:06	7439-96-5	
Nickel	**<5.7**	mg/kg	5.7	5	07/29/11 14:32	08/01/11 22:06	7440-02-0	
Zinc	**235**	mg/kg	5.7	5	07/29/11 14:32	08/01/11 22:06	7440-66-6	
7471 Mercury	Analytical Method: EPA 7471 Preparation Method: EPA 7471							
Mercury	**4.5**	mg/kg	0.24	10	08/01/11 09:52	08/03/11 13:43	7439-97-6	
Dry Weight	Analytical Method: % Moisture							
Percent Moisture	**20.7**	%	0.10	1		07/25/11 00:00		

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ANALYTICAL RESULTS

Project: BlackPine Mine REV
Pace Project No.: 10163437

Sample: CML-SD-21-00 **Lab ID: 10163437024** Collected: 07/12/11 15:00 Received: 07/15/11 09:25 Matrix: Solid

Results reported on a "dry-weight" basis

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
6010 MET ICP	Analytical Method: EPA 6010 Preparation Method: EPA 3050							
Antimony	**475**	mg/kg	2.2	5	07/29/11 14:32	08/01/11 22:20	7440-36-0	
Arsenic	**507**	mg/kg	2.2	5	07/29/11 14:32	08/01/11 22:20	7440-38-2	
Barium	**292**	mg/kg	2.2	5	07/29/11 14:32	08/01/11 22:20	7440-39-3	
Cadmium	**22.5**	mg/kg	0.22	5	07/29/11 14:32	08/01/11 22:20	7440-43-9	
Chromium	**5.6**	mg/kg	2.2	5	07/29/11 14:32	08/01/11 22:20	7440-47-3	
Cobalt	**5.0**	mg/kg	2.2	5	07/29/11 14:32	08/01/11 22:20	7440-48-4	
Copper	**1630**	mg/kg	2.2	5	07/29/11 14:32	08/01/11 22:20	7440-50-8	
Iron	**19200**	mg/kg	11.1	5	07/29/11 14:32	08/01/11 22:20	7439-89-6	
Lead	**2940**	mg/kg	1.3	5	07/29/11 14:32	08/01/11 22:20	7439-92-1	
Manganese	**474**	mg/kg	1.1	5	07/29/11 14:32	08/01/11 22:20	7439-96-5	
Nickel	**6.3**	mg/kg	4.4	5	07/29/11 14:32	08/01/11 22:20	7440-02-0	
Zinc	**413**	mg/kg	4.4	5	07/29/11 14:32	08/01/11 22:20	7440-66-6	
7471 Mercury	Analytical Method: EPA 7471 Preparation Method: EPA 7471							
Mercury	**6.3**	mg/kg	0.26	10	08/01/11 09:52	08/03/11 14:50	7439-97-6	
Dry Weight	Analytical Method: % Moisture							
Percent Moisture	**24.3**	%	0.10	1		07/25/11 00:00		

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ANALYTICAL RESULTS

Project: BlackPine Mine REV
Pace Project No.: 10163437

Sample: CML-SD-20-00 **Lab ID: 10163437025** Collected: 07/12/11 15:05 Received: 07/15/11 09:25 Matrix: Solid

Results reported on a "dry-weight" basis

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
6010 MET ICP	Analytical Method: EPA 6010 Preparation Method: EPA 3050							
Antimony	**528**	mg/kg	3.4	5	07/29/11 14:32	08/01/11 22:26	7440-36-0	
Arsenic	**617**	mg/kg	3.4	5	07/29/11 14:32	08/01/11 22:26	7440-38-2	
Barium	**430**	mg/kg	3.4	5	07/29/11 14:32	08/01/11 22:26	7440-39-3	
Cadmium	**25.9**	mg/kg	0.34	5	07/29/11 14:32	08/01/11 22:26	7440-43-9	
Chromium	**7.8**	mg/kg	3.4	5	07/29/11 14:32	08/01/11 22:26	7440-47-3	
Cobalt	**8.6**	mg/kg	3.4	5	07/29/11 14:32	08/01/11 22:26	7440-48-4	
Copper	**2430**	mg/kg	3.4	5	07/29/11 14:32	08/01/11 22:26	7440-50-8	
Iron	**19400**	mg/kg	17.1	5	07/29/11 14:32	08/01/11 22:26	7439-89-6	
Lead	**3720**	mg/kg	2.1	5	07/29/11 14:32	08/01/11 22:26	7439-92-1	
Manganese	**1280**	mg/kg	1.7	5	07/29/11 14:32	08/01/11 22:26	7439-96-5	
Nickel	**<6.8**	mg/kg	6.8	5	07/29/11 14:32	08/01/11 22:26	7440-02-0	
Zinc	**335**	mg/kg	6.8	5	07/29/11 14:32	08/01/11 22:26	7440-66-6	
7471 Mercury	Analytical Method: EPA 7471 Preparation Method: EPA 7471							
Mercury	**8.6**	mg/kg	0.31	10	08/01/11 09:52	08/03/11 14:17	7439-97-6	
Dry Weight	Analytical Method: % Moisture							
Percent Moisture	**36.4**	%	0.10	1		07/25/11 00:00		

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ANALYTICAL RESULTS

Project: BlackPine Mine REV
Pace Project No.: 10163437

Sample: CML-SD-20-02 **Lab ID: 10163437026** Collected: 07/12/11 15:50 Received: 07/15/11 09:25 Matrix: Solid

Results reported on a "dry-weight" basis

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
6010 MET ICP	Analytical Method: EPA 6010 Preparation Method: EPA 3050							
Antimony	**6.3**	mg/kg	2.8	5	07/29/11 14:32	08/01/11 22:33	7440-36-0	
Arsenic	**29.7**	mg/kg	2.8	5	07/29/11 14:32	08/01/11 22:33	7440-38-2	
Barium	**396**	mg/kg	2.8	5	07/29/11 14:32	08/01/11 22:33	7440-39-3	
Cadmium	**6.6**	mg/kg	0.28	5	07/29/11 14:32	08/01/11 22:33	7440-43-9	
Chromium	**15.5**	mg/kg	2.8	5	07/29/11 14:32	08/01/11 22:33	7440-47-3	
Cobalt	**21.3**	mg/kg	2.8	5	07/29/11 14:32	08/01/11 22:33	7440-48-4	
Copper	**136**	mg/kg	2.8	5	07/29/11 14:32	08/01/11 22:33	7440-50-8	
Iron	**27800**	mg/kg	13.8	5	07/29/11 14:32	08/01/11 22:33	7439-89-6	
Lead	**86.1**	mg/kg	1.7	5	07/29/11 14:32	08/01/11 22:33	7439-92-1	
Manganese	**1040**	mg/kg	1.4	5	07/29/11 14:32	08/01/11 22:33	7439-96-5	
Nickel	**23.2**	mg/kg	5.5	5	07/29/11 14:32	08/01/11 22:33	7440-02-0	
Zinc	**231**	mg/kg	5.5	5	07/29/11 14:32	08/01/11 22:33	7440-66-6	
7471 Mercury	Analytical Method: EPA 7471 Preparation Method: EPA 7471							
Mercury	**7.0**	mg/kg	0.27	10	08/01/11 09:52	08/03/11 14:23	7439-97-6	
Dry Weight	Analytical Method: % Moisture							
Percent Moisture	**27.5**	%	0.10	1		07/25/11 00:00		

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ANALYTICAL RESULTS

Project: BlackPine Mine REV
Pace Project No.: 10163437

Sample: CML-SD-42-00 **Lab ID: 10163437027** Collected: 07/13/11 08:15 Received: 07/15/11 09:25 Matrix: Solid

Results reported on a "dry-weight" basis

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
6010 MET ICP	Analytical Method: EPA 6010 Preparation Method: EPA 3050							
Antimony	**26.2**	mg/kg	2.2	5	07/29/11 14:32	08/01/11 22:39	7440-36-0	
Arsenic	**37.4**	mg/kg	2.2	5	07/29/11 14:32	08/01/11 22:39	7440-38-2	
Barium	**63.2**	mg/kg	2.2	5	07/29/11 14:32	08/01/11 22:39	7440-39-3	
Cadmium	**1.1**	mg/kg	0.22	5	07/29/11 14:32	08/01/11 22:39	7440-43-9	
Chromium	**9.5**	mg/kg	2.2	5	07/29/11 14:32	08/01/11 22:39	7440-47-3	
Cobalt	**3.5**	mg/kg	2.2	5	07/29/11 14:32	08/01/11 22:39	7440-48-4	
Copper	**123**	mg/kg	2.2	5	07/29/11 14:32	08/01/11 22:39	7440-50-8	
Iron	**14800**	mg/kg	11.0	5	07/29/11 14:32	08/01/11 22:39	7439-89-6	
Lead	**174**	mg/kg	1.3	5	07/29/11 14:32	08/01/11 22:39	7439-92-1	
Manganese	**88.4**	mg/kg	1.1	5	07/29/11 14:32	08/01/11 22:39	7439-96-5	
Nickel	**<4.4**	mg/kg	4.4	5	07/29/11 14:32	08/01/11 22:39	7440-02-0	
Zinc	**32.6**	mg/kg	4.4	5	07/29/11 14:32	08/01/11 22:39	7440-66-6	
7471 Mercury	Analytical Method: EPA 7471 Preparation Method: EPA 7471							
Mercury	**3.9**	mg/kg	0.22	10	08/01/11 09:52	08/03/11 14:25	7439-97-6	
Dry Weight	Analytical Method: % Moisture							
Percent Moisture	**15.0**	%	0.10	1		07/25/11 00:00		

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ANALYTICAL RESULTS

Project: BlackPine Mine REV
Pace Project No.: 10163437

Sample: CML-SD-42-02 **Lab ID: 10163437028** Collected: 07/13/11 08:45 Received: 07/15/11 09:25 Matrix: Solid

Results reported on a "dry-weight" basis

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
6010 MET ICP	Analytical Method: EPA 6010 Preparation Method: EPA 3050							
Antimony	**40.5**	mg/kg	2.6	5	07/29/11 14:32	08/01/11 22:46	7440-36-0	
Arsenic	**48.7**	mg/kg	2.6	5	07/29/11 14:32	08/01/11 22:46	7440-38-2	
Barium	**171**	mg/kg	2.6	5	07/29/11 14:32	08/01/11 22:46	7440-39-3	
Cadmium	**2.4**	mg/kg	0.26	5	07/29/11 14:32	08/01/11 22:46	7440-43-9	
Chromium	**11.6**	mg/kg	2.6	5	07/29/11 14:32	08/01/11 22:46	7440-47-3	
Cobalt	**5.7**	mg/kg	2.6	5	07/29/11 14:32	08/01/11 22:46	7440-48-4	
Copper	**309**	mg/kg	2.6	5	07/29/11 14:32	08/01/11 22:46	7440-50-8	
Iron	**15400**	mg/kg	12.8	5	07/29/11 14:32	08/01/11 22:46	7439-89-6	
Lead	**240**	mg/kg	1.5	5	07/29/11 14:32	08/01/11 22:46	7439-92-1	
Manganese	**323**	mg/kg	1.3	5	07/29/11 14:32	08/01/11 22:46	7439-96-5	
Nickel	**9.0**	mg/kg	5.1	5	07/29/11 14:32	08/01/11 22:46	7440-02-0	
Zinc	**71.9**	mg/kg	5.1	5	07/29/11 14:32	08/01/11 22:46	7440-66-6	
7471 Mercury	Analytical Method: EPA 7471 Preparation Method: EPA 7471							
Mercury	**5.0**	mg/kg	0.24	10	08/01/11 09:52	08/03/11 14:27	7439-97-6	
Dry Weight	Analytical Method: % Moisture							
Percent Moisture	**16.6**	%	0.10	1		07/25/11 00:00		

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ANALYTICAL RESULTS

Project: BlackPine Mine REV
Pace Project No.: 10163437

Sample: CML-SD-39-00 **Lab ID: 10163437029** Collected: 07/13/11 09:00 Received: 07/15/11 09:25 Matrix: Solid

Results reported on a "dry-weight" basis

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
6010 MET ICP	Analytical Method: EPA 6010 Preparation Method: EPA 3050							
Antimony	**23.0**	mg/kg	2.2	5	07/29/11 14:32	08/01/11 22:53	7440-36-0	
Arsenic	**27.2**	mg/kg	2.2	5	07/29/11 14:32	08/01/11 22:53	7440-38-2	
Barium	**414**	mg/kg	2.2	5	07/29/11 14:32	08/01/11 22:53	7440-39-3	
Cadmium	**2.2**	mg/kg	0.22	5	07/29/11 14:32	08/01/11 22:53	7440-43-9	
Chromium	**10.2**	mg/kg	2.2	5	07/29/11 14:32	08/01/11 22:53	7440-47-3	
Cobalt	**6.6**	mg/kg	2.2	5	07/29/11 14:32	08/01/11 22:53	7440-48-4	
Copper	**180**	mg/kg	2.2	5	07/29/11 14:32	08/01/11 22:53	7440-50-8	
Iron	**11900**	mg/kg	11.0	5	07/29/11 14:32	08/01/11 22:53	7439-89-6	
Lead	**238**	mg/kg	1.3	5	07/29/11 14:32	08/01/11 22:53	7439-92-1	
Manganese	**415**	mg/kg	1.1	5	07/29/11 14:32	08/01/11 22:53	7439-96-5	
Nickel	**12.1**	mg/kg	4.4	5	07/29/11 14:32	08/01/11 22:53	7440-02-0	
Zinc	**101**	mg/kg	4.4	5	07/29/11 14:32	08/01/11 22:53	7440-66-6	
7471 Mercury	Analytical Method: EPA 7471 Preparation Method: EPA 7471							
Mercury	**5.3**	mg/kg	0.24	10	08/01/11 09:52	08/03/11 14:29	7439-97-6	
Dry Weight	Analytical Method: % Moisture							
Percent Moisture	**18.1**	%	0.10	1		07/25/11 00:00		

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ANALYTICAL RESULTS

Project: BlackPine Mine REV
Pace Project No.: 10163437

Sample: CML-SD-30-00 **Lab ID: 10163437030** Collected: 07/13/11 09:20 Received: 07/15/11 09:25 Matrix: Solid

Results reported on a "dry-weight" basis

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
6010 MET ICP	Analytical Method: EPA 6010 Preparation Method: EPA 3050							
Antimony	**5.6**	mg/kg	2.5	5	07/29/11 14:32	08/01/11 22:59	7440-36-0	
Arsenic	**24.9**	mg/kg	2.5	5	07/29/11 14:32	08/01/11 22:59	7440-38-2	
Barium	**294**	mg/kg	2.5	5	07/29/11 14:32	08/01/11 22:59	7440-39-3	
Cadmium	**6.6**	mg/kg	0.25	5	07/29/11 14:32	08/01/11 22:59	7440-43-9	
Chromium	**15.1**	mg/kg	2.5	5	07/29/11 14:32	08/01/11 22:59	7440-47-3	
Cobalt	**23.7**	mg/kg	2.5	5	07/29/11 14:32	08/01/11 22:59	7440-48-4	
Copper	**1550**	mg/kg	2.5	5	07/29/11 14:32	08/01/11 22:59	7440-50-8	
Iron	**26500**	mg/kg	12.5	5	07/29/11 14:32	08/01/11 22:59	7439-89-6	
Lead	**81.8**	mg/kg	1.5	5	07/29/11 14:32	08/01/11 22:59	7439-92-1	
Manganese	**974**	mg/kg	1.2	5	07/29/11 14:32	08/01/11 22:59	7439-96-5	
Nickel	**12.9**	mg/kg	5.0	5	07/29/11 14:32	08/01/11 22:59	7440-02-0	
Zinc	**232**	mg/kg	5.0	5	07/29/11 14:32	08/01/11 22:59	7440-66-6	
7471 Mercury	Analytical Method: EPA 7471 Preparation Method: EPA 7471							
Mercury	**9.6**	mg/kg	0.26	10	08/01/11 09:52	08/03/11 14:31	7439-97-6	
Dry Weight	Analytical Method: % Moisture							
Percent Moisture	**23.7**	%	0.10	1		07/25/11 00:00		

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ANALYTICAL RESULTS

Project: BlackPine Mine REV
Pace Project No.: 10163437

Sample: CML-SD-22-00 **Lab ID: 10163437031** Collected: 07/13/11 09:35 Received: 07/15/11 09:25 Matrix: Solid

Results reported on a "dry-weight" basis

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
6010 MET ICP	Analytical Method: EPA 6010 Preparation Method: EPA 3050							
Antimony	**28.5**	mg/kg	2.6	5	07/29/11 14:32	08/01/11 23:05	7440-36-0	
Arsenic	**58.2**	mg/kg	2.6	5	07/29/11 14:32	08/01/11 23:05	7440-38-2	
Barium	**153**	mg/kg	2.6	5	07/29/11 14:32	08/01/11 23:05	7440-39-3	
Cadmium	**2.1**	mg/kg	0.26	5	07/29/11 14:32	08/01/11 23:05	7440-43-9	
Chromium	**12.2**	mg/kg	2.6	5	07/29/11 14:32	08/01/11 23:05	7440-47-3	
Cobalt	**9.9**	mg/kg	2.6	5	07/29/11 14:32	08/01/11 23:05	7440-48-4	
Copper	**154**	mg/kg	2.6	5	07/29/11 14:32	08/01/11 23:05	7440-50-8	
Iron	**22800**	mg/kg	13.0	5	07/29/11 14:32	08/01/11 23:05	7439-89-6	
Lead	**186**	mg/kg	1.6	5	07/29/11 14:32	08/01/11 23:05	7439-92-1	
Manganese	**610**	mg/kg	1.3	5	07/29/11 14:32	08/01/11 23:05	7439-96-5	
Nickel	**7.7**	mg/kg	5.2	5	07/29/11 14:32	08/01/11 23:05	7440-02-0	
Zinc	**118**	mg/kg	5.2	5	07/29/11 14:32	08/01/11 23:05	7440-66-6	
7471 Mercury	Analytical Method: EPA 7471 Preparation Method: EPA 7471							
Mercury	**1.6**	mg/kg	0.26	10	08/01/11 09:52	08/03/11 14:38	7439-97-6	
Dry Weight	Analytical Method: % Moisture							
Percent Moisture	**21.9**	%	0.10	1		07/25/11 00:00		

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ANALYTICAL RESULTS

Project: BlackPine Mine REV
Pace Project No.: 10163437

Sample: CML-SD-23-00 **Lab ID: 10163437032** Collected: 07/13/11 09:45 Received: 07/15/11 09:25 Matrix: Solid

Results reported on a "dry-weight" basis

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
6010 MET ICP	Analytical Method: EPA 6010 Preparation Method: EPA 3050							
Antimony	**40.9**	mg/kg	2.3	5	07/29/11 14:32	08/01/11 23:19	7440-36-0	
Arsenic	**61.6**	mg/kg	2.3	5	07/29/11 14:32	08/01/11 23:19	7440-38-2	
Barium	**190**	mg/kg	2.3	5	07/29/11 14:32	08/01/11 23:19	7440-39-3	
Cadmium	**2.4**	mg/kg	0.23	5	07/29/11 14:32	08/01/11 23:19	7440-43-9	
Chromium	**22.1**	mg/kg	2.3	5	07/29/11 14:32	08/01/11 23:19	7440-47-3	
Cobalt	**11.6**	mg/kg	2.3	5	07/29/11 14:32	08/01/11 23:19	7440-48-4	
Copper	**249**	mg/kg	2.3	5	07/29/11 14:32	08/01/11 23:19	7440-50-8	
Iron	**31600**	mg/kg	11.3	5	07/29/11 14:32	08/01/11 23:19	7439-89-6	
Lead	**282**	mg/kg	1.4	5	07/29/11 14:32	08/01/11 23:19	7439-92-1	
Manganese	**568**	mg/kg	1.1	5	07/29/11 14:32	08/01/11 23:19	7439-96-5	
Nickel	**10.5**	mg/kg	4.5	5	07/29/11 14:32	08/01/11 23:19	7440-02-0	
Zinc	**92.4**	mg/kg	4.5	5	07/29/11 14:32	08/01/11 23:19	7440-66-6	
7471 Mercury	Analytical Method: EPA 7471 Preparation Method: EPA 7471							
Mercury	**5.8**	mg/kg	0.22	10	08/01/11 09:52	08/03/11 14:40	7439-97-6	
Dry Weight	Analytical Method: % Moisture							
Percent Moisture	**21.5**	%	0.10	1		07/25/11 00:00		

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ANALYTICAL RESULTS

Project: BlackPine Mine REV
Pace Project No.: 10163437

Sample: CML-SD-23-02 **Lab ID: 10163437033** Collected: 07/13/11 09:50 Received: 07/15/11 09:25 Matrix: Solid

Results reported on a "dry-weight" basis

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
6010 MET ICP	Analytical Method: EPA 6010 Preparation Method: EPA 3050							
Antimony	**38.0**	mg/kg	2.2	5	07/29/11 14:32	08/01/11 23:25	7440-36-0	
Arsenic	**48.4**	mg/kg	2.2	5	07/29/11 14:32	08/01/11 23:25	7440-38-2	
Barium	**218**	mg/kg	2.2	5	07/29/11 14:32	08/01/11 23:25	7440-39-3	
Cadmium	**3.1**	mg/kg	0.22	5	07/29/11 14:32	08/01/11 23:25	7440-43-9	
Chromium	**21.6**	mg/kg	2.2	5	07/29/11 14:32	08/01/11 23:25	7440-47-3	
Cobalt	**13.0**	mg/kg	2.2	5	07/29/11 14:32	08/01/11 23:25	7440-48-4	
Copper	**661**	mg/kg	2.2	5	07/29/11 14:32	08/01/11 23:25	7440-50-8	
Iron	**30800**	mg/kg	11.2	5	07/29/11 14:32	08/01/11 23:25	7439-89-6	
Lead	**300**	mg/kg	1.3	5	07/29/11 14:32	08/01/11 23:25	7439-92-1	
Manganese	**789**	mg/kg	1.1	5	07/29/11 14:32	08/01/11 23:25	7439-96-5	
Nickel	**10.5**	mg/kg	4.5	5	07/29/11 14:32	08/01/11 23:25	7440-02-0	
Zinc	**108**	mg/kg	4.5	5	07/29/11 14:32	08/01/11 23:25	7440-66-6	
7471 Mercury	Analytical Method: EPA 7471 Preparation Method: EPA 7471							
Mercury	**2.9**	mg/kg	0.24	10	08/01/11 09:52	08/03/11 15:00	7439-97-6	
Dry Weight	Analytical Method: % Moisture							
Percent Moisture	**18.4**	%	0.10	1		07/25/11 00:00		

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ANALYTICAL RESULTS

Project: BlackPine Mine REV
Pace Project No.: 10163437

Sample: CML-SD-19-00 **Lab ID: 10163437034** Collected: 07/13/11 10:10 Received: 07/15/11 09:25 Matrix: Solid

Results reported on a "dry-weight" basis

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
6010 MET ICP	Analytical Method: EPA 6010 Preparation Method: EPA 3050							
Antimony	**614**	mg/kg	2.8	5	07/29/11 14:32	08/01/11 23:31	7440-36-0	
Arsenic	**442**	mg/kg	2.8	5	07/29/11 14:32	08/01/11 23:31	7440-38-2	
Barium	**238**	mg/kg	2.8	5	07/29/11 14:32	08/01/11 23:31	7440-39-3	
Cadmium	**15.4**	mg/kg	0.28	5	07/29/11 14:32	08/01/11 23:31	7440-43-9	
Chromium	**<2.8**	mg/kg	2.8	5	07/29/11 14:32	08/01/11 23:31	7440-47-3	
Cobalt	**<2.8**	mg/kg	2.8	5	07/29/11 14:32	08/01/11 23:31	7440-48-4	
Copper	**727**	mg/kg	2.8	5	07/29/11 14:32	08/01/11 23:31	7440-50-8	
Iron	**11900**	mg/kg	13.8	5	07/29/11 14:32	08/01/11 23:31	7439-89-6	
Lead	**2560**	mg/kg	1.7	5	07/29/11 14:32	08/01/11 23:31	7439-92-1	
Manganese	**264**	mg/kg	1.4	5	07/29/11 14:32	08/01/11 23:31	7439-96-5	
Nickel	**<5.5**	mg/kg	5.5	5	07/29/11 14:32	08/01/11 23:31	7440-02-0	
Zinc	**238**	mg/kg	5.5	5	07/29/11 14:32	08/01/11 23:31	7440-66-6	
7471 Mercury	Analytical Method: EPA 7471 Preparation Method: EPA 7471							
Mercury	**2.8**	mg/kg	0.21	10	08/01/11 09:52	08/03/11 15:02	7439-97-6	
Dry Weight	Analytical Method: % Moisture							
Percent Moisture	**9.2**	%	0.10	1		07/25/11 00:00		

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ANALYTICAL RESULTS

Project: BlackPine Mine REV
Pace Project No.: 10163437

Sample: CML-SD-19-02 **Lab ID: 10163437035** Collected: 07/13/11 10:15 Received: 07/15/11 09:25 Matrix: Solid

Results reported on a "dry-weight" basis

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
6010 MET ICP	Analytical Method: EPA 6010 Preparation Method: EPA 3050							
Antimony	**21.1**	mg/kg	2.4	5	07/29/11 14:32	08/01/11 23:37	7440-36-0	
Arsenic	**43.6**	mg/kg	2.4	5	07/29/11 14:32	08/01/11 23:37	7440-38-2	
Barium	**317**	mg/kg	2.4	5	07/29/11 14:32	08/01/11 23:37	7440-39-3	
Cadmium	**6.8**	mg/kg	0.24	5	07/29/11 14:32	08/01/11 23:37	7440-43-9	
Chromium	**16.8**	mg/kg	2.4	5	07/29/11 14:32	08/01/11 23:37	7440-47-3	
Cobalt	**19.6**	mg/kg	2.4	5	07/29/11 14:32	08/01/11 23:37	7440-48-4	
Copper	**361**	mg/kg	2.4	5	07/29/11 14:32	08/01/11 23:37	7440-50-8	
Iron	**26900**	mg/kg	11.9	5	07/29/11 14:32	08/01/11 23:37	7439-89-6	
Lead	**197**	mg/kg	1.4	5	07/29/11 14:32	08/01/11 23:37	7439-92-1	
Manganese	**920**	mg/kg	1.2	5	07/29/11 14:32	08/01/11 23:37	7439-96-5	
Nickel	**19.5**	mg/kg	4.8	5	07/29/11 14:32	08/01/11 23:37	7440-02-0	
Zinc	**339**	mg/kg	4.8	5	07/29/11 14:32	08/01/11 23:37	7440-66-6	
7471 Mercury	Analytical Method: EPA 7471 Preparation Method: EPA 7471							
Mercury	**3.4**	mg/kg	0.27	10	08/01/11 09:52	08/03/11 15:05	7439-97-6	
Dry Weight	Analytical Method: % Moisture							
Percent Moisture	**25.4**	%	0.10	1		07/25/11 00:00		

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ANALYTICAL RESULTS

Project: BlackPine Mine REV
Pace Project No.: 10163437

Sample: CML-SD-18-00 **Lab ID: 10163437036** Collected: 07/13/11 10:20 Received: 07/15/11 09:25 Matrix: Solid

Results reported on a "dry-weight" basis

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
6010 MET ICP	Analytical Method: EPA 6010 Preparation Method: EPA 3050							
Antimony	**76.1**	mg/kg	3.6	5	07/29/11 14:32	08/01/11 23:43	7440-36-0	
Arsenic	**211**	mg/kg	3.6	5	07/29/11 14:32	08/01/11 23:43	7440-38-2	M1
Barium	**793**	mg/kg	3.6	5	07/29/11 14:32	08/01/11 23:43	7440-39-3	M1
Cadmium	**14.8**	mg/kg	0.36	5	07/29/11 14:32	08/01/11 23:43	7440-43-9	
Chromium	**18.5**	mg/kg	3.6	5	07/29/11 14:32	08/01/11 23:43	7440-47-3	
Cobalt	**16.3**	mg/kg	3.6	5	07/29/11 14:32	08/01/11 23:43	7440-48-4	
Copper	**1070**	mg/kg	3.6	5	07/29/11 14:32	08/01/11 23:43	7440-50-8	M1
Iron	**29700**	mg/kg	17.9	5	07/29/11 14:32	08/01/11 23:43	7439-89-6	P6
Lead	**663**	mg/kg	2.1	5	07/29/11 14:32	08/01/11 23:43	7439-92-1	M1
Manganese	**1640**	mg/kg	1.8	5	07/29/11 14:32	08/01/11 23:43	7439-96-5	M1
Nickel	**24.1**	mg/kg	7.2	5	07/29/11 14:32	08/01/11 23:43	7440-02-0	
Zinc	**479**	mg/kg	7.2	5	07/29/11 14:32	08/01/11 23:43	7440-66-6	M1
7471 Mercury	Analytical Method: EPA 7471 Preparation Method: EPA 7471							
Mercury	**11.6**	mg/kg	0.43	10	08/01/11 09:52	08/03/11 15:13	7439-97-6	M6
Dry Weight	Analytical Method: % Moisture							
Percent Moisture	**53.2**	%	0.10	1		07/25/11 00:00		

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QUALITY CONTROL DATA

Project: BlackPine Mine REV
Pace Project No.: 10163437

QC Batch: MPRP/27174 Analysis Method: EPA 6010
QC Batch Method: EPA 3050 Analysis Description: 6010 MET
Associated Lab Samples: 10163437001, 10163437002, 10163437003, 10163437004, 10163437005, 10163437006, 10163437007, 10163437008, 10163437009, 10163437010, 10163437011, 10163437012, 10163437013, 10163437014, 10163437015, 10163437016, 10163437017, 10163437018, 10163437019, 10163437020

METHOD BLANK: 1014888 Matrix: Solid
Associated Lab Samples: 10163437001, 10163437002, 10163437003, 10163437004, 10163437005, 10163437006, 10163437007, 10163437008, 10163437009, 10163437010, 10163437011, 10163437012, 10163437013, 10163437014, 10163437015, 10163437016, 10163437017, 10163437018, 10163437019, 10163437020

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Antimony	mg/kg	<0.50	0.50	08/01/11 17:23	
Arsenic	mg/kg	<0.50	0.50	08/01/11 17:23	
Barium	mg/kg	<0.50	0.50	08/01/11 17:23	
Cadmium	mg/kg	<0.050	0.050	08/01/11 17:23	
Chromium	mg/kg	<0.50	0.50	08/01/11 17:23	
Cobalt	mg/kg	<0.50	0.50	08/01/11 17:23	
Copper	mg/kg	<0.50	0.50	08/01/11 17:23	
Iron	mg/kg	3.1	2.5	08/01/11 17:23	
Lead	mg/kg	<0.30	0.30	08/01/11 17:23	
Manganese	mg/kg	<0.25	0.25	08/01/11 17:23	
Nickel	mg/kg	<1.0	1.0	08/01/11 17:23	
Zinc	mg/kg	<1.0	1.0	08/01/11 17:23	

LABORATORY CONTROL SAMPLE: 1014889

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Antimony	mg/kg	47.2	44.7	95	80-120	
Arsenic	mg/kg	47.2	43.2	92	80-120	
Barium	mg/kg	47.2	45.4	96	80-120	
Cadmium	mg/kg	47.2	43.1	91	80-120	
Chromium	mg/kg	47.2	45.3	96	80-120	
Cobalt	mg/kg	47.2	44.7	95	80-120	
Copper	mg/kg	47.2	45.3	96	80-120	
Iron	mg/kg	472	509	108	80-120	
Lead	mg/kg	47.2	44.6	95	80-120	
Manganese	mg/kg	47.2	45.7	97	80-120	
Nickel	mg/kg	47.2	44.4	94	80-120	
Zinc	mg/kg	47.2	44.8	95	80-120	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 1014890 1014891

Parameter	Units	10163437001 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Antimony	mg/kg	2.8	50.8	55.3	27.1	29.2	48	48	75-125	7	30	M1
Arsenic	mg/kg	7.8	50.8	55.3	58.2	61.6	99	97	75-125	6	30	
Barium	mg/kg	285	50.8	55.3	405	393	235	195	75-125	3	30	M1

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QUALITY CONTROL DATA

Project: BlackPine Mine REV
Pace Project No.: 10163437

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 1014890 1014891

Parameter	Units	10163437001 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Cadmium	mg/kg	1.1	50.8	55.3	48.0	52.5	92	93	75-125	9	30	
Chromium	mg/kg	8.4	50.8	55.3	58.2	62.8	98	98	75-125	8	30	
Cobalt	mg/kg	7.7	50.8	55.3	53.9	59.9	91	94	75-125	11	30	
Copper	mg/kg	42.5	50.8	55.3	103	101	120	105	75-125	3	30	
Iron	mg/kg	9690	508	553	11800	12000	414	424	75-125	2	30	P6
Lead	mg/kg	37.5	50.8	55.3	103	96.3	130	106	75-125	7	30	M1
Manganese	mg/kg	739	50.8	55.3	620	771	-234	59	75-125	22	30	M1
Nickel	mg/kg	11.0	50.8	55.3	65.6	65.4	108	98	75-125	.2	30	
Zinc	mg/kg	78.3	50.8	55.3	146	138	134	108	75-125	6	30	M1

MATRIX SPIKE SAMPLE: 1014892

Parameter	Units	10163437020 Result	Spike Conc.	MS Result	MS % Rec	% Rec Limits	Qualifiers
Antimony	mg/kg	95.0	46.5	97.2	5	75-125	M1
Arsenic	mg/kg	109	46.5	147	82	75-125	
Barium	mg/kg	371	46.5	442	155	75-125	M1
Cadmium	mg/kg	6.5	46.5	47.3	88	75-125	
Chromium	mg/kg	10.0	46.5	52.0	90	75-125	
Cobalt	mg/kg	15.3	46.5	56.9	90	75-125	
Copper	mg/kg	500	46.5	567	144	75-125	M1
Iron	mg/kg	16500	465	17900	283	75-125	P6
Lead	mg/kg	617	46.5	637	43	75-125	M1
Manganese	mg/kg	1190	46.5	1250	118	75-125	
Nickel	mg/kg	10.4	46.5	52.6	91	75-125	
Zinc	mg/kg	269	46.5	334	141	75-125	M1

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QUALITY CONTROL DATA

Project: BlackPine Mine REV
Pace Project No.: 10163437

QC Batch: MPRP/27175 Analysis Method: EPA 6010
QC Batch Method: EPA 3050 Analysis Description: 6010 MET
Associated Lab Samples: 10163437021, 10163437022, 10163437023, 10163437024, 10163437025, 10163437026, 10163437027, 10163437028, 10163437029, 10163437030, 10163437031, 10163437032, 10163437033, 10163437034, 10163437035, 10163437036

METHOD BLANK: 1014893 Matrix: Solid
Associated Lab Samples: 10163437021, 10163437022, 10163437023, 10163437024, 10163437025, 10163437026, 10163437027, 10163437028, 10163437029, 10163437030, 10163437031, 10163437032, 10163437033, 10163437034, 10163437035, 10163437036

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Antimony	mg/kg	<0.48	0.48	08/01/11 21:28	
Arsenic	mg/kg	<0.48	0.48	08/01/11 21:28	
Barium	mg/kg	<0.48	0.48	08/01/11 21:28	
Cadmium	mg/kg	<0.048	0.048	08/01/11 21:28	
Chromium	mg/kg	<0.48	0.48	08/01/11 21:28	
Cobalt	mg/kg	<0.48	0.48	08/01/11 21:28	
Copper	mg/kg	<0.48	0.48	08/01/11 21:28	
Iron	mg/kg	2.9	2.4	08/01/11 21:28	
Lead	mg/kg	<0.29	0.29	08/01/11 21:28	
Manganese	mg/kg	<0.24	0.24	08/01/11 21:28	
Nickel	mg/kg	<0.95	0.95	08/01/11 21:28	
Zinc	mg/kg	<0.95	0.95	08/01/11 21:28	

LABORATORY CONTROL SAMPLE: 1014894

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Antimony	mg/kg	48.5	45.8	94	80-120	
Arsenic	mg/kg	48.5	43.9	90	80-120	
Barium	mg/kg	48.5	46.1	95	80-120	
Cadmium	mg/kg	48.5	43.6	90	80-120	
Chromium	mg/kg	48.5	46.1	95	80-120	
Cobalt	mg/kg	48.5	45.3	93	80-120	
Copper	mg/kg	48.5	46.2	95	80-120	
Iron	mg/kg	485	528	109	80-120	
Lead	mg/kg	48.5	45.2	93	80-120	
Manganese	mg/kg	48.5	46.4	96	80-120	
Nickel	mg/kg	48.5	45.0	93	80-120	
Zinc	mg/kg	48.5	44.7	92	80-120	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 1014895 1014896

Parameter	Units	10163437021 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Antimony	mg/kg	24.0	53.4	64.6	46.0	54.8	41	48	75-125	17	30	M1
Arsenic	mg/kg	30.5	53.4	64.6	79.4	96.8	92	103	75-125	20	30	
Barium	mg/kg	425	53.4	64.6	431	455	13	47	75-125	5	30	M1

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QUALITY CONTROL DATA

Project: BlackPine Mine REV
Pace Project No.: 10163437

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 1014895 1014896

Parameter	Units	10163437021 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Cadmium	mg/kg	13.8	53.4	64.6	61.3	72.1	89	90	75-125	16	30	
Chromium	mg/kg	16.3	53.4	64.6	70.4	76.7	101	93	75-125	9	30	
Cobalt	mg/kg	25.8	53.4	64.6	69.8	82.3	82	87	75-125	16	30	
Copper	mg/kg	1390	53.4	64.6	1370	1470	-24	125	75-125	7	30	M1
Iron	mg/kg	23200	534	646	24100	23800	167	104	75-125	.9	30	P6
Lead	mg/kg	182	53.4	64.6	228	278	87	149	75-125	20	30	M1
Manganese	mg/kg	2050	53.4	64.6	1680	1990	-692	-93	75-125	17	30	M1,P6
Nickel	mg/kg	22.5	53.4	64.6	74.5	81.5	97	91	75-125	9	30	
Zinc	mg/kg	328	53.4	64.6	378	414	94	133	75-125	9	30	M1

MATRIX SPIKE SAMPLE: 1014897

Parameter	Units	10163437036 Result	Spike Conc.	MS Result	MS % Rec	% Rec Limits	Qualifiers
Antimony	mg/kg	76.1	97.1	161	88	75-125	
Arsenic	mg/kg	211	97.1	352	145	75-125	M1
Barium	mg/kg	793	97.1	932	143	75-125	M1
Cadmium	mg/kg	14.8	97.1	107	95	75-125	
Chromium	mg/kg	18.5	97.1	112	97	75-125	
Cobalt	mg/kg	16.3	97.1	107	94	75-125	
Copper	mg/kg	1070	97.1	1330	268	75-125	M1
Iron	mg/kg	29700	971	31200	159	75-125	P6
Lead	mg/kg	663	97.1	1020	363	75-125	M1
Manganese	mg/kg	1640	97.1	2090	457	75-125	M1
Nickel	mg/kg	24.1	97.1	115	94	75-125	
Zinc	mg/kg	479	97.1	646	172	75-125	M1

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QUALITY CONTROL DATA

Project: BlackPine Mine REV
Pace Project No.: 10163437

QC Batch: MERP/5637 Analysis Method: EPA 7471
QC Batch Method: EPA 7471 Analysis Description: 7471 Mercury
Associated Lab Samples: 10163437001, 10163437002, 10163437003, 10163437004, 10163437005, 10163437006, 10163437007, 10163437008, 10163437009, 10163437010, 10163437011, 10163437012, 10163437013, 10163437014, 10163437015, 10163437016, 10163437017, 10163437018, 10163437019, 10163437020

METHOD BLANK: 1015384 Matrix: Solid
Associated Lab Samples: 10163437001, 10163437002, 10163437003, 10163437004, 10163437005, 10163437006, 10163437007, 10163437008, 10163437009, 10163437010, 10163437011, 10163437012, 10163437013, 10163437014, 10163437015, 10163437016, 10163437017, 10163437018, 10163437019, 10163437020

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Mercury	mg/kg	<0.019	0.019	08/04/11 07:16	

LABORATORY CONTROL SAMPLE: 1015385

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Mercury	mg/kg	.5	0.50	101	80-120	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 1015386 1015387

Parameter	Units	10163437001 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Mercury	mg/kg	1.1	.64	.67	0.86	0.93	-44	-33	80-120	7	20	M6

MATRIX SPIKE SAMPLE: 1015388

Parameter	Units	10163437020 Result	Spike Conc.	MS Result	MS % Rec	% Rec Limits	Qualifiers
Mercury	mg/kg	4.9	.55	7.6	493	80-120	M6

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QUALITY CONTROL DATA

Project: BlackPine Mine REV
Pace Project No.: 10163437

QC Batch: MERP/5638 Analysis Method: EPA 7471
QC Batch Method: EPA 7471 Analysis Description: 7471 Mercury
Associated Lab Samples: 10163437021, 10163437022, 10163437023, 10163437024, 10163437025, 10163437026, 10163437027, 10163437028, 10163437029, 10163437030, 10163437031, 10163437032, 10163437033, 10163437034, 10163437035, 10163437036

METHOD BLANK: 1015391 Matrix: Solid
Associated Lab Samples: 10163437021, 10163437022, 10163437023, 10163437024, 10163437025, 10163437026, 10163437027, 10163437028, 10163437029, 10163437030, 10163437031, 10163437032, 10163437033, 10163437034, 10163437035, 10163437036

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Mercury	mg/kg	<0.020	0.020	08/03/11 13:19	

LABORATORY CONTROL SAMPLE: 1015392

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Mercury	mg/kg	.5	0.50	101	80-120	

MATRIX SPIKE SAMPLE: 1015395

Parameter	Units	10163437036 Result	Spike Conc.	MS Result	MS % Rec	% Rec Limits	Qualifiers
Mercury	mg/kg	11.6	1	12.0	42	80-120	M6

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 1024027 1024028

Parameter	Units	10163437021 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Mercury	mg/kg	5.6	.62	.61	3.9	5.6	-285	-8	80-120	37	20	D6,M6

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QUALITY CONTROL DATA

Project: BlackPine Mine REV
Pace Project No.: 10163437

QC Batch: MPRP/27307 Analysis Method: % Moisture
QC Batch Method: % Moisture Analysis Description: Dry Weight/Percent Moisture
Associated Lab Samples: 10163437001, 10163437002, 10163437003, 10163437004, 10163437005, 10163437006, 10163437007, 10163437008, 10163437009, 10163437010, 10163437011, 10163437012, 10163437013, 10163437014

SAMPLE DUPLICATE: 1019547

Parameter	Units	10163645009 Result	Dup Result	RPD	Max RPD	Qualifiers
Percent Moisture	%	14.3	15.0	5	30	

SAMPLE DUPLICATE: 1019548

Parameter	Units	10163437014 Result	Dup Result	RPD	Max RPD	Qualifiers
Percent Moisture	%	29.7	28.2	5	30	

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QUALITY CONTROL DATA

Project: BlackPine Mine REV
Pace Project No.: 10163437

QC Batch: MPRP/27310 Analysis Method: % Moisture
QC Batch Method: % Moisture Analysis Description: Dry Weight/Percent Moisture
Associated Lab Samples: 10163437015, 10163437016, 10163437017, 10163437018, 10163437019, 10163437020, 10163437021, 10163437022, 10163437023, 10163437024, 10163437025, 10163437026, 10163437027, 10163437028, 10163437029, 10163437030, 10163437031, 10163437032, 10163437033, 10163437034

SAMPLE DUPLICATE: 1019641

Parameter	Units	10163437015 Result	Dup Result	RPD	Max RPD	Qualifiers
Percent Moisture	%	14.2	12.2	15	30	

SAMPLE DUPLICATE: 1019642

Parameter	Units	10163437034 Result	Dup Result	RPD	Max RPD	Qualifiers
Percent Moisture	%	9.2	7.5	20	30	

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QUALITY CONTROL DATA

Project: BlackPine Mine REV
Pace Project No.: 10163437

QC Batch: MPRP/27315
QC Batch Method: % Moisture
Analysis Method: % Moisture
Analysis Description: Dry Weight/Percent Moisture
Associated Lab Samples: 10163437035, 10163437036

SAMPLE DUPLICATE: 1019708

Parameter	Units	10164017001 Result	Dup Result	RPD	Max RPD	Qualifiers
Percent Moisture	%	4.3	4.3	1	30	

SAMPLE DUPLICATE: 1019709

Parameter	Units	10163630018 Result	Dup Result	RPD	Max RPD	Qualifiers
Percent Moisture	%	39.4	39.2	.4	30	

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QUALIFIERS

Project: BlackPine Mine REV
Pace Project No.: 10163437

DEFINITIONS

DF - Dilution Factor, if reported, represents the factor applied to the reported data due to changes in sample preparation, dilution of the sample aliquot, or moisture content.

ND - Not Detected at or above adjusted reporting limit.

J - Estimated concentration above the adjusted method detection limit and below the adjusted reporting limit.

MDL - Adjusted Method Detection Limit.

S - Surrogate

1,2-Diphenylhydrazine (8270 listed analyte) decomposes to Azobenzene.

Consistent with EPA guidelines, unrounded data are displayed and have been used to calculate % recovery and RPD values.

LCS(D) - Laboratory Control Sample (Duplicate)

MS(D) - Matrix Spike (Duplicate)

DUP - Sample Duplicate

RPD - Relative Percent Difference

NC - Not Calculable.

SG - Silica Gel - Clean-Up

U - Indicates the compound was analyzed for, but not detected.

N-Nitrosodiphenylamine decomposes and cannot be separated from Diphenylamine using Method 8270. The result reported for each analyte is a combined concentration.

LABORATORIES

PASI-M	Pace Analytical Services - Minneapolis

ANALYTE QUALIFIERS

D6	The relative percent difference (RPD) between the sample and sample duplicate exceeded laboratory control limits.
M1	Matrix spike recovery exceeded QC limits. Batch accepted based on laboratory control sample (LCS) recovery.
M6	Matrix spike and Matrix spike duplicate recovery not evaluated against control limits due to sample dilution.
P6	Matrix spike recovery was outside laboratory control limits due to a parent sample concentration notably higher than the spike level.

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QUALITY CONTROL DATA CROSS REFERENCE TABLE

Project: BlackPine Mine REV
Pace Project No.: 10163437

Lab ID	Sample ID	QC Batch Method	QC Batch	Analytical Method	Analytical Batch
10163437001	**CML-SD-45**	EPA 3050	MPRP/27174	EPA 6010	ICP/11627
10163437002	**CML-SD-43**	EPA 3050	MPRP/27174	EPA 6010	ICP/11627
10163437003	**CML-SD-40**	EPA 3050	MPRP/27174	EPA 6010	ICP/11627
10163437004	**CML-SD-37**	EPA 3050	MPRP/27174	EPA 6010	ICP/11627
10163437005	**CML-SD-36**	EPA 3050	MPRP/27174	EPA 6010	ICP/11627
10163437006	**CML-SD-34**	EPA 3050	MPRP/27174	EPA 6010	ICP/11627
10163437007	**CML-SD-35**	EPA 3050	MPRP/27174	EPA 6010	ICP/11627
10163437008	**CML-SD-38**	EPA 3050	MPRP/27174	EPA 6010	ICP/11627
10163437009	**CML-SD-41**	EPA 3050	MPRP/27174	EPA 6010	ICP/11627
10163437010	**CML-SD-44**	EPA 3050	MPRP/27174	EPA 6010	ICP/11627
10163437011	**CML-SD-46**	EPA 3050	MPRP/27174	EPA 6010	ICP/11627
10163437012	**CML-SD-33-00**	EPA 3050	MPRP/27174	EPA 6010	ICP/11627
10163437013	**CML-SD-33-01**	EPA 3050	MPRP/27174	EPA 6010	ICP/11627
10163437014	**CML-SD-32-00**	EPA 3050	MPRP/27174	EPA 6010	ICP/11627
10163437015	**CML-SD-31-00**	EPA 3050	MPRP/27174	EPA 6010	ICP/11627
10163437016	**CML-SD-31-02**	EPA 3050	MPRP/27174	EPA 6010	ICP/11627
10163437017	**CML-SD-29-00**	EPA 3050	MPRP/27174	EPA 6010	ICP/11627
10163437018	**CML-SD-28-00**	EPA 3050	MPRP/27174	EPA 6010	ICP/11627
10163437019	**CML-SD-27-00**	EPA 3050	MPRP/27174	EPA 6010	ICP/11627
10163437020	**CML-SD-24-00**	EPA 3050	MPRP/27174	EPA 6010	ICP/11627
10163437021	**CML-SD-24-01**	EPA 3050	MPRP/27175	EPA 6010	ICP/11631
10163437022	**CML-SD-25-00**	EPA 3050	MPRP/27175	EPA 6010	ICP/11631
10163437023	**CML-SD-26-00**	EPA 3050	MPRP/27175	EPA 6010	ICP/11631
10163437024	**CML-SD-21-00**	EPA 3050	MPRP/27175	EPA 6010	ICP/11631
10163437025	**CML-SD-20-00**	EPA 3050	MPRP/27175	EPA 6010	ICP/11631
10163437026	**CML-SD-20-02**	EPA 3050	MPRP/27175	EPA 6010	ICP/11631
10163437027	**CML-SD-42-00**	EPA 3050	MPRP/27175	EPA 6010	ICP/11631
10163437028	**CML-SD-42-02**	EPA 3050	MPRP/27175	EPA 6010	ICP/11631
10163437029	**CML-SD-39-00**	EPA 3050	MPRP/27175	EPA 6010	ICP/11631
10163437030	**CML-SD-30-00**	EPA 3050	MPRP/27175	EPA 6010	ICP/11631
10163437031	**CML-SD-22-00**	EPA 3050	MPRP/27175	EPA 6010	ICP/11631
10163437032	**CML-SD-23-00**	EPA 3050	MPRP/27175	EPA 6010	ICP/11631
10163437033	**CML-SD-23-02**	EPA 3050	MPRP/27175	EPA 6010	ICP/11631
10163437034	**CML-SD-19-00**	EPA 3050	MPRP/27175	EPA 6010	ICP/11631
10163437035	**CML-SD-19-02**	EPA 3050	MPRP/27175	EPA 6010	ICP/11631
10163437036	**CML-SD-18-00**	EPA 3050	MPRP/27175	EPA 6010	ICP/11631
10163437001	**CML-SD-45**	EPA 7471	MERP/5637	EPA 7471	MERC/6517
10163437002	**CML-SD-43**	EPA 7471	MERP/5637	EPA 7471	MERC/6517
10163437003	**CML-SD-40**	EPA 7471	MERP/5637	EPA 7471	MERC/6517
10163437004	**CML-SD-37**	EPA 7471	MERP/5637	EPA 7471	MERC/6517
10163437005	**CML-SD-36**	EPA 7471	MERP/5637	EPA 7471	MERC/6517
10163437006	**CML-SD-34**	EPA 7471	MERP/5637	EPA 7471	MERC/6517
10163437007	**CML-SD-35**	EPA 7471	MERP/5637	EPA 7471	MERC/6517
10163437008	**CML-SD-38**	EPA 7471	MERP/5637	EPA 7471	MERC/6517
10163437009	**CML-SD-41**	EPA 7471	MERP/5637	EPA 7471	MERC/6517
10163437010	**CML-SD-44**	EPA 7471	MERP/5637	EPA 7471	MERC/6517
10163437011	**CML-SD-46**	EPA 7471	MERP/5637	EPA 7471	MERC/6517
10163437012	**CML-SD-33-00**	EPA 7471	MERP/5637	EPA 7471	MERC/6517

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QUALITY CONTROL DATA CROSS REFERENCE TABLE

Project: BlackPine Mine REV
Pace Project No.: 10163437

Lab ID	Sample ID	QC Batch Method	QC Batch	Analytical Method	Analytical Batch
10163437013	**CML-SD-33-01**	EPA 7471	MERP/5637	EPA 7471	MERC/6517
10163437014	**CML-SD-32-00**	EPA 7471	MERP/5637	EPA 7471	MERC/6517
10163437015	**CML-SD-31-00**	EPA 7471	MERP/5637	EPA 7471	MERC/6517
10163437016	**CML-SD-31-02**	EPA 7471	MERP/5637	EPA 7471	MERC/6517
10163437017	**CML-SD-29-00**	EPA 7471	MERP/5637	EPA 7471	MERC/6517
10163437018	**CML-SD-28-00**	EPA 7471	MERP/5637	EPA 7471	MERC/6517
10163437019	**CML-SD-27-00**	EPA 7471	MERP/5637	EPA 7471	MERC/6517
10163437020	**CML-SD-24-00**	EPA 7471	MERP/5637	EPA 7471	MERC/6517
10163437021	**CML-SD-24-01**	EPA 7471	MERP/5638	EPA 7471	MERC/6504
10163437022	**CML-SD-25-00**	EPA 7471	MERP/5638	EPA 7471	MERC/6504
10163437023	**CML-SD-26-00**	EPA 7471	MERP/5638	EPA 7471	MERC/6504
10163437024	**CML-SD-21-00**	EPA 7471	MERP/5638	EPA 7471	MERC/6504
10163437025	**CML-SD-20-00**	EPA 7471	MERP/5638	EPA 7471	MERC/6504
10163437026	**CML-SD-20-02**	EPA 7471	MERP/5638	EPA 7471	MERC/6504
10163437027	**CML-SD-42-00**	EPA 7471	MERP/5638	EPA 7471	MERC/6504
10163437028	**CML-SD-42-02**	EPA 7471	MERP/5638	EPA 7471	MERC/6504
10163437029	**CML-SD-39-00**	EPA 7471	MERP/5638	EPA 7471	MERC/6504
10163437030	**CML-SD-30-00**	EPA 7471	MERP/5638	EPA 7471	MERC/6504
10163437031	**CML-SD-22-00**	EPA 7471	MERP/5638	EPA 7471	MERC/6504
10163437032	**CML-SD-23-00**	EPA 7471	MERP/5638	EPA 7471	MERC/6504
10163437033	**CML-SD-23-02**	EPA 7471	MERP/5638	EPA 7471	MERC/6504
10163437034	**CML-SD-19-00**	EPA 7471	MERP/5638	EPA 7471	MERC/6504
10163437035	**CML-SD-19-02**	EPA 7471	MERP/5638	EPA 7471	MERC/6504
10163437036	**CML-SD-18-00**	EPA 7471	MERP/5638	EPA 7471	MERC/6504
10163437001	**CML-SD-45**	% Moisture	MPRP/27307		
10163437002	**CML-SD-43**	% Moisture	MPRP/27307		
10163437003	**CML-SD-40**	% Moisture	MPRP/27307		
10163437004	**CML-SD-37**	% Moisture	MPRP/27307		
10163437005	**CML-SD-36**	% Moisture	MPRP/27307		
10163437006	**CML-SD-34**	% Moisture	MPRP/27307		
10163437007	**CML-SD-35**	% Moisture	MPRP/27307		
10163437008	**CML-SD-38**	% Moisture	MPRP/27307		
10163437009	**CML-SD-41**	% Moisture	MPRP/27307		
10163437010	**CML-SD-44**	% Moisture	MPRP/27307		
10163437011	**CML-SD-46**	% Moisture	MPRP/27307		
10163437012	**CML-SD-33-00**	% Moisture	MPRP/27307		
10163437013	**CML-SD-33-01**	% Moisture	MPRP/27307		
10163437014	**CML-SD-32-00**	% Moisture	MPRP/27307		
10163437015	**CML-SD-31-00**	% Moisture	MPRP/27310		
10163437016	**CML-SD-31-02**	% Moisture	MPRP/27310		
10163437017	**CML-SD-29-00**	% Moisture	MPRP/27310		
10163437018	**CML-SD-28-00**	% Moisture	MPRP/27310		
10163437019	**CML-SD-27-00**	% Moisture	MPRP/27310		
10163437020	**CML-SD-24-00**	% Moisture	MPRP/27310		
10163437021	**CML-SD-24-01**	% Moisture	MPRP/27310		
10163437022	**CML-SD-25-00**	% Moisture	MPRP/27310		
10163437023	**CML-SD-26-00**	% Moisture	MPRP/27310		

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Billings, MT 591014549
(406)254-7226

QUALITY CONTROL DATA CROSS REFERENCE TABLE

Project: BlackPine Mine REV
Pace Project No.: 10163437

Lab ID	Sample ID	QC Batch Method	QC Batch	Analytical Method	Analytical Batch
10163437024	**CML-SD-21-00**	% Moisture	MPRP/27310		
10163437025	**CML-SD-20-00**	% Moisture	MPRP/27310		
10163437026	**CML-SD-20-02**	% Moisture	MPRP/27310		
10163437027	**CML-SD-42-00**	% Moisture	MPRP/27310		
10163437028	**CML-SD-42-02**	% Moisture	MPRP/27310		
10163437029	**CML-SD-39-00**	% Moisture	MPRP/27310		
10163437030	**CML-SD-30-00**	% Moisture	MPRP/27310		
10163437031	**CML-SD-22-00**	% Moisture	MPRP/27310		
10163437032	**CML-SD-23-00**	% Moisture	MPRP/27310		
10163437033	**CML-SD-23-02**	% Moisture	MPRP/27310		
10163437034	**CML-SD-19-00**	% Moisture	MPRP/27310		
10163437035	**CML-SD-19-02**	% Moisture	MPRP/27315		
10163437036	**CML-SD-18-00**	% Moisture	MPRP/27315		

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CHAIN-OF-CUSTODY / Analytical Request Document

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Page: 1 of 3

1321667

Section A Required Client Information:	Section B Required Project Information:	Section C Invoice Information:
Company: Herrera	Report To: Reyon Houck	Attention:
Address:	Copy To: Mark Donner	Company Name:
		Address:
Email To:	Purchase Order No.:	Pace Quote Reference:
Phone: Fax:	Project Name:	Pace Project Manager:
Requested Due Date/TAT:	Project Number:	Pace Profile #:

REGULATORY AGENCY

☐ NPDES ☐ GROUND WATER ☐ DRINKING WATER

☐ UST ☐ RCRA ☐ OTHER _____

Site Location STATE: _____

Section D Required Client Information

SAMPLE ID
(A-Z, 0-9 / ,-)
Sample IDs MUST BE UNIQUE

Matrix Codes — MATRIX / CODE

Drinking Water	DW
Water	WT
Waste Water	WW
Product	P
Soil/Solid	SL
Oil	OL
Wipe	WP
Air	AR
Tissue	TS
Other	OT

Requested Analysis Filtered (Y/N)

ITEM #	SAMPLE ID	MATRIX CODE (see valid codes to left)	SAMPLE TYPE (G=GRAB C=COMP)	COLLECTED: COMPOSITE START DATE	COLLECTED: COMPOSITE START TIME	COLLECTED: COMPOSITE END/GRAB DATE	COLLECTED: COMPOSITE END/GRAB TIME	SAMPLE TEMP AT COLLECTION	# OF CONTAINERS	Preservatives: Unpreserved	Preservatives: H_2SO_4	Preservatives: HNO_3	Preservatives: HCl	Preservatives: NaOH	Preservatives: $Na_2S_2O_3$	Preservatives: Methanol	Preservatives: Other	Y/N	Analysis Test ↓	Total Metals	Residual Chlorine (Y/N)	Pace Project No./ Lab I.D. 10103937
1	CML-SD-45	SL		7/11/11	0915				1	X												001
2	CML-SD-43				0930				1	X												002
3	CML-SD-40				0940				1	X												003
4	CML-SD-37				0945				1	X												004
5	CML-SD-36				0955				1	X												005
6	CML-SD-34				1010				1	X												006
7	CML-SD-35				1015				1	X												007
8	CML-SD-38				1025				1	X												008
9	CML-SD-41				1035				1	X												009
10	CML-SD-44				1040				1	X												010
11	CML-SD-46				1045				1	X												011
12	CML-SD-33-00	SL			1145				1	X												012

ADDITIONAL COMMENTS	RELINQUISHED BY / AFFILIATION	DATE	TIME	ACCEPTED BY / AFFILIATION	DATE	TIME	SAMPLE CONDITIONS			
	[signature] / THC	7/13/11	1445	[signature] / HEC	7/13/11	1445				
	~~[signature] / HEC~~	7/13/11	1500	[signature]	7/13/11	1500				
	FedEx (G)	7/14/11	0925	[signature]	7/14/11	0925	2.6	Y	Y	X
							Temp in °C	Received on Ice (Y/N)	Custody Sealed Cooler (Y/N)	Samples Intact (Y/N)

ORIGINAL

SAMPLER NAME AND SIGNATURE

PRINT Name of SAMPLER: Luke Donnell

SIGNATURE of SAMPLER: [signature] DATE Signed (MM/DD/YY): 7/13/11

*Important Note: By signing this form you are accepting Pace's NET 30 day payment terms and agreeing to late charges of 1.5% per month for any invoices not paid within 30 days.

F-ALL-Q-020rev.07, 15-May-2007

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CHAIN-OF-CUSTODY / Analytical Request Document

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1321666

Section A Required Client Information:	Section B Required Project Information:	Section C Invoice Information:
Company: Herrera	Report To: Kevin Houck	Attention:
Address:	Copy To: Mark Donner	Company Name:
		Address:
Email To:	Purchase Order No.:	Pace Quote Reference:
Phone: Fax:	Project Name:	Pace Project Manager:
Requested Due Date/TAT:	Project Number:	Pace Profile #:

REGULATORY AGENCY

☐ NPDES ☐ GROUND WATER ☐ DRINKING WATER

☐ UST ☐ RCRA ☐ OTHER _____

Site Location STATE: _____

Section D Required Client Information

SAMPLE ID
(A-Z, 0-9 / ,-)
Sample IDs MUST BE UNIQUE

Matrix Codes — MATRIX / CODE

Drinking Water	DW
Water	WT
Waste Water	WW
Product	P
Soil/Solid	SL
Oil	OL
Wipe	WP
Air	AR
Tissue	TS
Other	OT

Requested Analysis Filtered (Y/N)

ITEM #	MATRIX CODE (see valid codes to left)	SAMPLE TYPE (G=GRAB C=COMP)	COLLECTED COMPOSITE START DATE	COLLECTED COMPOSITE START TIME	COLLECTED COMPOSITE END/GRAB DATE	COLLECTED COMPOSITE END/GRAB TIME	SAMPLE TEMP AT COLLECTION	# OF CONTAINERS	Preservatives: Unpreserved	H_2SO_4	HNO_3	HCl	NaOH	$Na_2S_2O_3$	Methanol	Other	Analysis Test Y/N	Total Metals	Residual Chlorine (Y/N)	Pace Project No./ Lab I.D. 10160257
1	SL		7/6/11	1150				1	X											013
2				1210				1	X											014
3				1220				1	X											015
4				1235				1	X											016
5				1250				1	X											017
6				1255				1	X											018
7				1420				1	X											019
8				1430				1	X											020
9				1435				1	X											021
10				1445				1	X											022
11				1450				1	X											023
12	SL		7/6/11	1500				1	X											024

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ADDITIONAL COMMENTS	RELINQUISHED BY / AFFILIATION	DATE	TIME	ACCEPTED BY / AFFILIATION	DATE	TIME	SAMPLE CONDITIONS			
	THC	7/13/11	1445	HEC	7/13/11	1445				
	HEC	7/13/11	1500		7/13/11	3:00				
	Fed Ex G	7/14/11	0925	Kari Poehls, Pace	7/14/11	0925	2.6	Y	Y	Y

ORIGINAL

SAMPLER NAME AND SIGNATURE

PRINT Name of SAMPLER: Lucy Dannell

SIGNATURE of SAMPLER: [signature] DATE Signed (MM/DD/YY): 7/13/11

Temp in °C | Received on Ice (Y/N) | Custody Sealed Cooler (Y/N) | Samples Intact (Y/N)

*Important Note: By signing this form you are accepting Pace's NET 30 day payment terms and agreeing to late charges of 1.5% per month for any invoices not paid within 30 days.

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CHAIN-OF-CUSTODY / Analytical Request Document

The Chain-of-Custody is a LEGAL DOCUMENT. All relevant fields must be completed accurately.

1429994

Section A Required Client Information:	Section B Required Project Information:	Section C Invoice Information:
Company: Stevens	Report To: Kevin Hoods	Attention:
Address:	Copy To: Mark Doner	Company Name:
		Address:
Email To:	Purchase Order No.:	Pace Quote Reference:
Phone: Fax:	Project Name:	Pace Project Manager:
Requested Due Date/TAT:	Project Number:	Pace Profile #:

REGULATORY AGENCY

☐ NPDES ☐ GROUND WATER ☐ DRINKING WATER

☐ UST ☐ RCRA ☐ OTHER _____

Site Location STATE: _____

Section D Required Client Information

SAMPLE ID
(A-Z, 0-9 / ,-)
Sample IDs MUST BE UNIQUE

Matrix Codes — MATRIX / CODE
Drinking Water DW
Water WT
Waste Water WW
Product P
Soil/Solid SL
Oil OL
Wipe WP
Air AR
Tissue TS
Other OT

Requested Analysis Filtered (Y/N)

ITEM #	SAMPLE ID	MATRIX CODE (see valid codes to left)	SAMPLE TYPE (G=GRAB C=COMP)	COLLECTED: COMPOSITE START DATE	COLLECTED: COMPOSITE START TIME	COLLECTED: COMPOSITE END/GRAB DATE	COLLECTED: COMPOSITE END/GRAB TIME	SAMPLE TEMP AT COLLECTION	# OF CONTAINERS	Preservatives: Unpreserved	H_2SO_4	HNO_3	HCl	NaOH	$Na_2S_2O_3$	Methanol	Other	Analysis Test Y/N	Total Metals	Residual Chlorine (Y/N)	Pace Project No./ Lab I.D.
1	CML-SD-20-00	SL		7/13/11	1505				1	X											025
2	CML-SD-20-02			7/13/11	1550				1	X											026
3	CML-SD-42-00			7/13/11	0815				1	X											027
4	CML-SD-42-02			7/13/11	0845				1	X											028
5	CML-SD-39-00				0900				1	X											029
6	CML-SD-30-00				0920				1	X											030
7	CML-SD-22-00				0935				1	X											031
8	CML-SD-23-00				0945				1	X											032
9	CML-SD-23-02				0950				1	X											033
10	CML-SD-19-00				1010				1	X											034
11	CML-SD-19-02				1015				1	X											035
12	CML-SD-15-00	SL		7/13/11	1025				1	X											036

ADDITIONAL COMMENTS	RELINQUISHED BY / AFFILIATION	DATE	TIME	ACCEPTED BY / AFFILIATION	DATE	TIME	SAMPLE CONDITIONS			
	DPC / THC	7/13/11	1445	DPC	7/13/11	1445				
	DPC / HEC	7/13/11	1500	[illegible]	7/13/11	3:00				
	FedEx (G)	7/14/11	0925	Kari Poehler, Pace	7/14/11	0925	26	V	V	V

ORIGINAL

SAMPLER NAME AND SIGNATURE

PRINT Name of SAMPLER: Luke Dantl

SIGNATURE of SAMPLER: [signature] DATE Signed (MM/DD/YY): 7/13/11

Temp in °C | Received on Ice (Y/N) | Custody Sealed Cooler (Y/N) | Samples Intact (Y/N)

*Important Note: By signing this form you are accepting Pace's NET 30 day payment terms and agreeing to late charges of 1.5% per month for any invoices not paid within 30 days.

Sample Condition Upon Receipt

Pace Analytical

Client Name: Herrera/MDSA Project # 10163437

Courier: ☒ Fed Ex ☐ UPS ☐ USPS ☐ Client ☐ Commercial ☐ Pace Other _____

Tracking #: 8797184

Custody Seal on Cooler/Box Present: ☒ yes ☐ no Seals intact: ☒ yes ☐ no

Packing Material: ☐ Bubble Wrap ☒ Bubble Bags ☐ None ☐ Other _____ Temp Blank: Yes X No _____

Thermometer Used 1383045 or 135 Type of Ice: (Wet) Blue None ☒ Samples on ice, cooling process has begun

Cooler Temperature 2.6 Biological Tissue is Frozen: Yes No

Date and Initials of person examining contents: ESP 7/15/11

Temp should be above freezing to 6°C

Comments:

Chain of Custody Present:	☒Yes	☐No	☐N/A
Chain of Custody Filled Out:	☒Yes	☐No	☐N/A
Chain of Custody Relinquished:	☒Yes	☐No	☐N/A
Sampler Name & Signature on COC:	☒Yes	☐No	☐N/A
Samples Arrived within Hold Time:	☒Yes	☐No	☐N/A
Short Hold Time Analysis (<72hr):	☐Yes	☒No	☐N/A
Rush Turn Around Time Requested:	☐Yes	☒No	☐N/A
Sufficient Volume:	☒Yes	☐No	☐N/A
Correct Containers Used:	☒Yes	☐No	☐N/A
-Pace Containers Used:	☒Yes	☐No	☐N/A
Containers Intact:	☒Yes	☐No	☐N/A
Filtered volume received for Dissolved tests	☐Yes	☐No	☒N/A
Sample Labels match COC:	☒Yes	☐No	☐N/A
-Includes date/time/ID/Analysis Matrix: SL			
All containers needing acid/base preservation have been checked. Noncompliance are noted in 13.	☐Yes	☐No	☒N/A
All containers needing preservation are found to be in compliance with EPA recommendation.	☐Yes	☐No	☒N/A
Exceptions: VOA,Coliform, TOC, Oil and Grease, WI-DRO (water)	☐Yes	☒No	
Samples checked for dechlorination:	☐Yes	☐No	☒N/A
Headspace in VOA Vials (>6mm):	☐Yes	☐No	☒N/A
Trip Blank Present:	☐Yes	☒No	☐N/A
Trip Blank Custody Seals Present	☐Yes	☐No	☒N/A
Pace Trip Blank Lot # (if purchased): NA			

1.
2.
3.
4.
5.
6.
7.
8.
9.
10.
11.
12.
13. ☐ HNO3 ☐ H2SO4 ☐ NaOH ☐ HCl
Samp #

Initial when completed	Lot # of added preservative

14.
15.
16.

Client Notification/ Resolution: Field Data Required? Y / N

Person Contacted: _____ Date/Time: _____

Comments/ Resolution: _____

Project Manager Review: _____ **Date:** 7/14/11

Note: Whenever there is a discrepancy affecting North Carolina compliance samples, a copy of this form will be sent to the North Carolina DEHNR Certification Office (i.e out of hold, incorrect preservative, out of temp, incorrect containers)

Pace Analytical Services, Inc.
602 S 25th Street
Billings, MT 591014549
(406)254-7226

October 18, 2011

Kevin Houck
Herrera Environmental Consultants
101 East Broadway, Suite 610
Missoula, MT 59802

RE: Project: Black Pine Mine REV
Pace Project No.: 10163483

Dear Kevin Houck:
Enclosed are the analytical results for sample(s) received by the laboratory on July 14, 2011. The results relate only to the samples included in this report.

This report has been revised to add Cobalt and delete Silver.

If you have any questions concerning this report, please feel free to contact me.

Sincerely,

Shawn Davis for
Sally Heinje
sally.heinje@pacelabs.com
Project Manager

Enclosures

cc: Devin Clary, Montana Dept. of Environmental Quality
Mark Donner, Trihydro
Jamie Mongoven, Montana Dept. of Environmental

REPORT OF LABORATORY ANALYSIS

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Billings, MT 591014549
(406)254-7226

CERTIFICATIONS

Project: Black Pine Mine REV
Pace Project No.: 10163483

Minnesota Certification IDs

1700 Elm Street SE Suite 200, Minneapolis, MN 55414
A2LA Certification #: 2926.01
Alaska Certification #: UST-078
Alaska Certification #MN00064
Arizona Certification #: AZ-0014
Arkansas Certification #: 88-0680
California Certification #: 01155CA
EPA Region 8 Certification #: Pace
Florida/NELAP Certification #: E87605
Georgia Certification #: 959
Idaho Certification #: MN00064
Illinois Certification #: 200011
Iowa Certification #: 368
Kansas Certification #: E-10167
Louisiana Certification #: 03086
Louisiana Certification #: LA080009
Maine Certification #: 2007029
Maryland Certification #: 322
Michigan DEQ Certification #: 9909
Minnesota Certification #: 027-053-137
Mississippi Certification #: Pace
Montana Certification #: MT CERT0092
Nebraska Certification #: Pace
Nevada Certification #: MN_00064
New Jersey Certification #: MN-002
New Mexico Certification #: Pace
New York Certification #: 11647
North Carolina Certification #: 530
North Dakota Certification #: R-036
North Dakota Certification #: R-036A
Ohio VAP Certification #: CL101
Oklahoma Certification #: D9921
Oklahoma Certification #: 9507
Oregon Certification #: MN200001
Pennsylvania Certification #: 68-00563
Puerto Rico Certification
Tennessee Certification #: 02818
Texas Certification #: T104704192
Washington Certification #: C754
Wisconsin Certification #: 999407970

Montana Certification IDs

602 South 25th Street, Billings, MT 59101
EPA Region 8 Certification #: 8TMS-Q
Idaho Certification #: MT00012
Montana Certification #: MT CERT0040
NVLAP Certification #: 101292-0
Minnesota Dept of Health Certification #: 030-999-442

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Pace Analytical Services, Inc.
602 S 25th Street
Billings, MT 591014549
(406)254-7226

SAMPLE SUMMARY

Project: Black Pine Mine REV
Pace Project No.: 10163483

Lab ID	Sample ID	Matrix	Date Collected	Date Received
10163483001	**BP-TS-RS-01-04**	Solid	07/12/11 14:08	07/14/11 09:25
10163483002	**BP-TS-SS-01-06**	Solid	07/12/11 14:10	07/14/11 09:25
10163483003	**BP-TS-SS-03-03**	Solid	07/12/11 14:36	07/14/11 09:25
10163483004	**BP-TS-RS-03-02**	Solid	07/12/11 14:40	07/14/11 09:25
10163483005	**BP-TS-SS-02-02**	Solid	07/12/11 15:24	07/14/11 09:25
10163483006	**BP-TS-SS-08-01**	Solid	07/13/11 08:32	07/14/11 09:25
10163483007	**BP-TS-RS-07-04**	Solid	07/13/11 08:49	07/14/11 09:25
10163483008	**BP-TS-SS-07-01**	Solid	07/13/11 08:55	07/14/11 09:25
10163483009	**BP-HM-RS-08-02**	Solid	07/13/11 09:30	07/14/11 09:25
10163483010	**BP-HM-SS-15-00**	Solid	07/13/11 09:45	07/14/11 09:25

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Pace Analytical Services, Inc.
602 S 25th Street
Billings, MT 591014549
(406)254-7226

SAMPLE ANALYTE COUNT

Project: Black Pine Mine REV
Pace Project No.: 10163483

Lab ID	Sample ID	Method	Analysts	Analytes Reported	Laboratory
10163483001	**BP-TS-RS-01-04**	EPA 6020	TL1	12	PASI-M
		EPA 7471	TEM	1	PASI-M
		% Moisture	JDL	1	PASI-M
		Modified Sobek 3.2	JH1	1	PASI-MT
		Modified Sobek 3.2	JH1	5	PASI-MT
		Modified Sobek 3.2	JH1	4	PASI-MT
		Modified Sobek 3.2	JH1	1	PASI-MT
10163483002	**BP-TS-SS-01-06**	EPA 6020	TL1	12	PASI-M
		EPA 7471	TEM	1	PASI-M
		% Moisture	JDL	1	PASI-M
10163483003	**BP-TS-SS-03-03**	EPA 6020	TL1	12	PASI-M
		EPA 7471	TEM	1	PASI-M
		% Moisture	JDL	1	PASI-M
10163483004	**BP-TS-RS-03-02**	EPA 6020	TL1	12	PASI-M
		EPA 7471	TEM	1	PASI-M
		% Moisture	JDL	1	PASI-M
		Modified Sobek 3.2	JH1	1	PASI-MT
		Modified Sobek 3.2	JH1	5	PASI-MT
		Modified Sobek 3.2	JH1	4	PASI-MT
		Modified Sobek 3.2	JH1	1	PASI-MT
10163483005	**BP-TS-SS-02-02**	EPA 6020	TL1	12	PASI-M
		EPA 7471	TEM	1	PASI-M
		% Moisture	JDL	1	PASI-M
10163483006	**BP-TS-SS-08-01**	EPA 6020	TL1	12	PASI-M
		EPA 7471	TEM	1	PASI-M
		% Moisture	JDL	1	PASI-M
10163483007	**BP-TS-RS-07-04**	EPA 6020	RJS	12	PASI-M
		EPA 7471	TEM	1	PASI-M
		% Moisture	JDL	1	PASI-M
		Modified Sobek 3.2	JH1	1	PASI-MT
		Modified Sobek 3.2	JH1	5	PASI-MT
		Modified Sobek 3.2	JH1	4	PASI-MT
		Modified Sobek 3.2	JH1	1	PASI-MT
10163483008	**BP-TS-SS-07-01**	EPA 6020	RJS	12	PASI-M
		EPA 7471	TEM	1	PASI-M
		% Moisture	JDL	1	PASI-M
10163483009	**BP-HM-RS-08-02**	EPA 6020	RJS	12	PASI-M

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SAMPLE ANALYTE COUNT

Project: Black Pine Mine REV
Pace Project No.: 10163483

Lab ID	Sample ID	Method	Analysts	Analytes Reported	Laboratory
		EPA 7471	TEM	1	PASI-M
		% Moisture	JDL	1	PASI-M
		Modified Sobek 3.2	JH1	1	PASI-MT
		Modified Sobek 3.2	JH1	5	PASI-MT
		Modified Sobek 3.2	JH1	4	PASI-MT
		Modified Sobek 3.2	JH1	1	PASI-MT
10163483010	**BP-HM-SS-15-00**	EPA 6020	RJS	12	PASI-M
		EPA 7471	TEM	1	PASI-M
		% Moisture	JDL	1	PASI-M
		Modified Sobek 3.2	JH1	1	PASI-MT
		Modified Sobek 3.2	JH1	5	PASI-MT
		Modified Sobek 3.2	JH1	4	PASI-MT
		Modified Sobek 3.2	JH1	1	PASI-MT

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PROJECT NARRATIVE

Project: Black Pine Mine REV
Pace Project No.: 10163483

Method: **EPA 6020**
Description: 6020 MET ICPMS
Client: Montana Dept. of Environmental Quality
Date: October 18, 2011

General Information:
10 samples were analyzed for EPA 6020. All samples were received in acceptable condition with any exceptions noted below.

Hold Time:
The samples were analyzed within the method required hold times with any exceptions noted below.

Sample Preparation:
The samples were prepared in accordance with EPA 3050 with any exceptions noted below.

Initial Calibrations (including MS Tune as applicable):
All criteria were within method requirements with any exceptions noted below.

Continuing Calibration:
All criteria were within method requirements with any exceptions noted below.

Internal Standards:
All internal standards were within QC limits with any exceptions noted below.

Method Blank:
All analytes were below the report limit in the method blank with any exceptions noted below.

Laboratory Control Spike:
All laboratory control spike compounds were within QC limits with any exceptions noted below.

Matrix Spikes:
All percent recoveries and relative percent differences (RPDs) were within acceptance criteria with any exceptions noted below.

QC Batch: MPRP/27167

A matrix spike and matrix spike duplicate (MS/MSD) were performed on the following sample(s): 10163483007,10163634007

M6: Matrix spike and Matrix spike duplicate recovery not evaluated against control limits due to sample dilution.

- MS (Lab ID: 1014855)
  - Antimony
  - Arsenic
  - Barium
  - Cadmium
  - Chromium
  - Copper
  - Iron
  - Lead
  - Manganese
  - Nickel
  - Zinc
- MS (Lab ID: 1014857)
  - Antimony

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PROJECT NARRATIVE

Project: Black Pine Mine REV
Pace Project No.: 10163483

Method: **EPA 6020**
Description: 6020 MET ICPMS
Client: Montana Dept. of Environmental Quality
Date: October 18, 2011

QC Batch: MPRP/27167

A matrix spike and matrix spike duplicate (MS/MSD) were performed on the following sample(s): 10163483007,10163634007

M6: Matrix spike and Matrix spike duplicate recovery not evaluated against control limits due to sample dilution.

- Arsenic
- Barium
- Cadmium
- Chromium
- Copper
- Iron
- Lead
- Manganese
- Nickel
- Zinc

- MSD (Lab ID: 1014856)
  - Antimony
  - Arsenic
  - Barium
  - Cadmium
  - Chromium
  - Copper
  - Iron
  - Lead
  - Manganese
  - Nickel
  - Zinc

QC Batch: MPRP/27166

A matrix spike and matrix spike duplicate (MS/MSD) were performed on the following sample(s): 10163633001,10163633011

M6: Matrix spike and Matrix spike duplicate recovery not evaluated against control limits due to sample dilution.

- MS (Lab ID: 1014850)
  - Antimony
  - Arsenic
  - Barium
  - Cadmium
  - Chromium
  - Copper
  - Iron
  - Lead
  - Manganese
  - Nickel
  - Zinc
- MS (Lab ID: 1014852)
  - Antimony
  - Arsenic
  - Barium
  - Cadmium

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PROJECT NARRATIVE

Project: Black Pine Mine REV
Pace Project No.: 10163483

Method: **EPA 6020**
Description: 6020 MET ICPMS
Client: Montana Dept. of Environmental Quality
Date: October 18, 2011

QC Batch: MPRP/27166

A matrix spike and matrix spike duplicate (MS/MSD) were performed on the following sample(s): 10163633001,10163633011

M6: Matrix spike and Matrix spike duplicate recovery not evaluated against control limits due to sample dilution.

- Chromium
- Copper
- Iron
- Lead
- Manganese
- Nickel
- Zinc

- MSD (Lab ID: 1014851)
  - Antimony
  - Arsenic
  - Barium
  - Cadmium
  - Chromium
  - Copper
  - Iron
  - Lead
  - Manganese
  - Nickel
  - Zinc

Duplicate Sample:
All duplicate sample results were within method acceptance criteria with any exceptions noted below.

Additional Comments:

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PROJECT NARRATIVE

Project: Black Pine Mine REV
Pace Project No.: 10163483

Method: **EPA 7471**
Description: 7471 Mercury
Client: Montana Dept. of Environmental Quality
Date: October 18, 2011

General Information:
10 samples were analyzed for EPA 7471. All samples were received in acceptable condition with any exceptions noted below.

Hold Time:
The samples were analyzed within the method required hold times with any exceptions noted below.

Sample Preparation:
The samples were prepared in accordance with EPA 7471 with any exceptions noted below.

Initial Calibrations (including MS Tune as applicable):
All criteria were within method requirements with any exceptions noted below.

Continuing Calibration:
All criteria were within method requirements with any exceptions noted below.

Method Blank:
All analytes were below the report limit in the method blank with any exceptions noted below.

Laboratory Control Spike:
All laboratory control spike compounds were within QC limits with any exceptions noted below.

Matrix Spikes:
All percent recoveries and relative percent differences (RPDs) were within acceptance criteria with any exceptions noted below.

QC Batch: MERP/5632

A matrix spike and matrix spike duplicate (MS/MSD) were performed on the following sample(s): 10163246001,10163483010

M1: Matrix spike recovery exceeded QC limits. Batch accepted based on laboratory control sample (LCS) recovery.

- MS (Lab ID: 1014984)
  - Mercury
- MSD (Lab ID: 1014985)
  - Mercury

M6: Matrix spike and Matrix spike duplicate recovery not evaluated against control limits due to sample dilution.

- MS (Lab ID: 1014986)
  - Mercury

Duplicate Sample:
All duplicate sample results were within method acceptance criteria with any exceptions noted below.

Additional Comments:

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PROJECT NARRATIVE

Project: Black Pine Mine REV
Pace Project No.: 10163483

Method: **Modified Sobek 3.2**
Description: Sobek Acid Base Potential
Client: Montana Dept. of Environmental Quality
Date: October 18, 2011

General Information:
5 samples were analyzed for Modified Sobek 3.2. All samples were received in acceptable condition with any exceptions noted below.

Hold Time:
The samples were analyzed within the method required hold times with any exceptions noted below.

Initial Calibrations (including MS Tune as applicable):
All criteria were within method requirements with any exceptions noted below.

Continuing Calibration:
All criteria were within method requirements with any exceptions noted below.

Internal Standards:
All internal standards were within QC limits with any exceptions noted below.

Surrogates:
All surrogates were within QC limits with any exceptions noted below.

Method Blank:
All analytes were below the report limit in the method blank with any exceptions noted below.

Laboratory Control Spike:
All laboratory control spike compounds were within QC limits with any exceptions noted below.

Matrix Spikes:
All percent recoveries and relative percent differences (RPDs) were within acceptance criteria with any exceptions noted below.

Duplicate Sample:
All duplicate sample results were within method acceptance criteria with any exceptions noted below.

Additional Comments:

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PROJECT NARRATIVE

Project: Black Pine Mine REV
Pace Project No.: 10163483

Method: **Modified Sobek 3.2**
Description: Sobek Extractable Sulfur
Client: Montana Dept. of Environmental Quality
Date: October 18, 2011

General Information:
5 samples were analyzed for Modified Sobek 3.2. All samples were received in acceptable condition with any exceptions noted below.

Hold Time:
The samples were analyzed within the method required hold times with any exceptions noted below.

Initial Calibrations (including MS Tune as applicable):
All criteria were within method requirements with any exceptions noted below.

Continuing Calibration:
All criteria were within method requirements with any exceptions noted below.

Internal Standards:
All internal standards were within QC limits with any exceptions noted below.

Surrogates:
All surrogates were within QC limits with any exceptions noted below.

Method Blank:
All analytes were below the report limit in the method blank with any exceptions noted below.

Laboratory Control Spike:
All laboratory control spike compounds were within QC limits with any exceptions noted below.

Matrix Spikes:
All percent recoveries and relative percent differences (RPDs) were within acceptance criteria with any exceptions noted below.

Duplicate Sample:
All duplicate sample results were within method acceptance criteria with any exceptions noted below.

Additional Comments:

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PROJECT NARRATIVE

Project: Black Pine Mine REV
Pace Project No.: 10163483

Method: **Modified Sobek 3.2**
Description: Sobek Calculations
Client: Montana Dept. of Environmental Quality
Date: October 18, 2011

General Information:
5 samples were analyzed for Modified Sobek 3.2. All samples were received in acceptable condition with any exceptions noted below.

Hold Time:
The samples were analyzed within the method required hold times with any exceptions noted below.

Initial Calibrations (including MS Tune as applicable):
All criteria were within method requirements with any exceptions noted below.

Continuing Calibration:
All criteria were within method requirements with any exceptions noted below.

Internal Standards:
All internal standards were within QC limits with any exceptions noted below.

Surrogates:
All surrogates were within QC limits with any exceptions noted below.

Method Blank:
All analytes were below the report limit in the method blank with any exceptions noted below.

Laboratory Control Spike:
All laboratory control spike compounds were within QC limits with any exceptions noted below.

Matrix Spikes:
All percent recoveries and relative percent differences (RPDs) were within acceptance criteria with any exceptions noted below.

Duplicate Sample:
All duplicate sample results were within method acceptance criteria with any exceptions noted below.

Additional Comments:

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PROJECT NARRATIVE

Project: Black Pine Mine REV
Pace Project No.: 10163483

Method: **Modified Sobek 3.2**
Description: Sobek SMP Buffer pH
Client: Montana Dept. of Environmental Quality
Date: October 18, 2011

General Information:
5 samples were analyzed for Modified Sobek 3.2. All samples were received in acceptable condition with any exceptions noted below.

Hold Time:
The samples were analyzed within the method required hold times with any exceptions noted below.

Initial Calibrations (including MS Tune as applicable):
All criteria were within method requirements with any exceptions noted below.

Continuing Calibration:
All criteria were within method requirements with any exceptions noted below.

Internal Standards:
All internal standards were within QC limits with any exceptions noted below.

Surrogates:
All surrogates were within QC limits with any exceptions noted below.

Method Blank:
All analytes were below the report limit in the method blank with any exceptions noted below.

Laboratory Control Spike:
All laboratory control spike compounds were within QC limits with any exceptions noted below.

Matrix Spikes:
All percent recoveries and relative percent differences (RPDs) were within acceptance criteria with any exceptions noted below.

Duplicate Sample:
All duplicate sample results were within method acceptance criteria with any exceptions noted below.

Additional Comments:

This data package has been reviewed for quality and completeness and is approved for release.

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ANALYTICAL RESULTS

Project: Black Pine Mine REV
Pace Project No.: 10163483

Sample: BP-TS-RS-01-04 **Lab ID: 10163483001** Collected: 07/12/11 14:08 Received: 07/14/11 09:25 Matrix: Solid

Results reported on a "dry-weight" basis

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
6020 MET ICPMS	Analytical Method: EPA 6020 Preparation Method: EPA 3050							
Antimony	**508**	mg/kg	2.2	100	08/01/11 15:37	08/03/11 17:56	7440-36-0	
Arsenic	**629**	mg/kg	2.2	100	08/01/11 15:37	08/03/11 17:56	7440-38-2	
Barium	**241**	mg/kg	0.26	20	08/01/11 15:37	08/03/11 17:40	7440-39-3	
Cadmium	**3.9**	mg/kg	0.070	20	08/01/11 15:37	08/03/11 17:40	7440-43-9	
Chromium	**1.8**	mg/kg	0.44	20	08/01/11 15:37	08/03/11 17:40	7440-47-3	
Cobalt	**0.94**	mg/kg	0.44	20	08/01/11 15:37	08/03/11 17:40	7440-48-4	
Copper	**1510**	mg/kg	2.2	100	08/01/11 15:37	08/03/11 17:56	7440-50-8	
Iron	**26500**	mg/kg	220	100	08/01/11 15:37	08/03/11 17:56	7439-89-6	
Lead	**1880**	mg/kg	0.44	100	08/01/11 15:37	08/03/11 17:56	7439-92-1	
Manganese	**248**	mg/kg	0.44	20	08/01/11 15:37	08/03/11 17:40	7439-96-5	
Nickel	**<2.2**	mg/kg	2.2	100	08/01/11 15:37	08/03/11 17:56	7440-02-0	
Zinc	**149**	mg/kg	22.0	100	08/01/11 15:37	08/03/11 17:56	7440-66-6	
7471 Mercury	Analytical Method: EPA 7471 Preparation Method: EPA 7471							
Mercury	**2.3**	mg/kg	0.18	10	07/28/11 19:33	07/31/11 12:57	7439-97-6	
Dry Weight	Analytical Method: % Moisture							
Percent Moisture	**5.2**	%	0.10	1		07/22/11 00:00		
Sobek Acid Base Potential	Analytical Method: Modified Sobek 3.2							
Neutralization Potential	**<0.5**	tons/1000	0.50	1		08/02/11 00:00		
Sobek Extractable Sulfur	Analytical Method: Modified Sobek 3.2							
Sulfur, HCl Extractable	**<0.050**	% (w/w)	0.050	1		08/02/11 09:40		
Sulfur, HNO3 Extractable	**0.0546**	% (w/w)	0.050	1		08/02/11 09:40		
Sulfur, Hot Water Extractable	**0.0639**	% (w/w)	0.050	1		08/02/11 09:40		
Sulfur, Residual	**<0.050**	% (w/w)	0.050	1		08/02/11 09:40		
Total Sulfur	**0.141**	% (w/w)	0.050	1		08/02/11 09:40		
Sobek Calculations	Analytical Method: Modified Sobek 3.2							
Acid/Base Potential	**0**	tons/1000		1		08/02/11 00:00		
Acid Potential	**<4.3**	tons/1000	4.3	1		08/02/11 00:00		
Lime Requirement	**<5.4**	tons/1000	5.4	1		08/02/11 00:00		
SMP Lime Requirement	**0**	tons/1000	0.0	1		08/02/11 00:00		
Sobek SMP Buffer pH	Analytical Method: Modified Sobek 3.2							
SMP Buffer pH	**7.1**	Std. Units	0.10	1		07/26/11 09:40		

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ANALYTICAL RESULTS

Project: Black Pine Mine REV
Pace Project No.: 10163483

Sample: BP-TS-SS-01-06 **Lab ID: 10163483002** Collected: 07/12/11 14:10 Received: 07/14/11 09:25 Matrix: Solid

Results reported on a "dry-weight" basis

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
6020 MET ICPMS	Analytical Method: EPA 6020 Preparation Method: EPA 3050							
Antimony	**7.5**	mg/kg	0.51	20	08/01/11 15:37	08/03/11 17:59	7440-36-0	
Arsenic	**11.5**	mg/kg	0.51	20	08/01/11 15:37	08/03/11 17:59	7440-38-2	
Barium	**130**	mg/kg	0.30	20	08/01/11 15:37	08/03/11 17:59	7440-39-3	
Cadmium	**0.31**	mg/kg	0.081	20	08/01/11 15:37	08/03/11 17:59	7440-43-9	
Chromium	**4.8**	mg/kg	0.51	20	08/01/11 15:37	08/03/11 17:59	7440-47-3	
Cobalt	**3.1**	mg/kg	0.51	20	08/01/11 15:37	08/03/11 17:59	7440-48-4	
Copper	**19.0**	mg/kg	0.51	20	08/01/11 15:37	08/03/11 17:59	7440-50-8	
Iron	**6920**	mg/kg	50.7	20	08/01/11 15:37	08/03/11 17:59	7439-89-6	
Lead	**28.6**	mg/kg	0.10	20	08/01/11 15:37	08/03/11 17:59	7439-92-1	
Manganese	**660**	mg/kg	2.5	100	08/01/11 15:37	08/03/11 18:02	7439-96-5	
Nickel	**5.1**	mg/kg	0.51	20	08/01/11 15:37	08/03/11 17:59	7440-02-0	
Zinc	**32.3**	mg/kg	5.1	20	08/01/11 15:37	08/03/11 17:59	7440-66-6	
7471 Mercury	Analytical Method: EPA 7471 Preparation Method: EPA 7471							
Mercury	**0.047**	mg/kg	0.019	1	07/28/11 19:33	07/31/11 13:09	7439-97-6	
Dry Weight	Analytical Method: % Moisture							
Percent Moisture	**10.3**	%	0.10	1		07/22/11 00:00		

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ANALYTICAL RESULTS

Project: Black Pine Mine REV
Pace Project No.: 10163483

Sample: BP-TS-SS-03-03 **Lab ID: 10163483003** Collected: 07/12/11 14:36 Received: 07/14/11 09:25 Matrix: Solid

Results reported on a "dry-weight" basis

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
6020 MET ICPMS	Analytical Method: EPA 6020 Preparation Method: EPA 3050							
Antimony	**5.7**	mg/kg	0.58	20	08/01/11 15:37	08/03/11 18:06	7440-36-0	
Arsenic	**11.5**	mg/kg	0.58	20	08/01/11 15:37	08/03/11 18:06	7440-38-2	
Barium	**154**	mg/kg	0.35	20	08/01/11 15:37	08/03/11 18:06	7440-39-3	
Cadmium	**0.87**	mg/kg	0.093	20	08/01/11 15:37	08/03/11 18:06	7440-43-9	
Chromium	**7.5**	mg/kg	0.58	20	08/01/11 15:37	08/03/11 18:06	7440-47-3	
Cobalt	**3.5**	mg/kg	0.58	20	08/01/11 15:37	08/03/11 18:06	7440-48-4	
Copper	**730**	mg/kg	11.6	400	08/01/11 15:37	08/03/11 18:09	7440-50-8	
Iron	**11400**	mg/kg	57.9	20	08/01/11 15:37	08/03/11 18:06	7439-89-6	
Lead	**65.7**	mg/kg	0.12	20	08/01/11 15:37	08/03/11 18:06	7439-92-1	
Manganese	**457**	mg/kg	0.58	20	08/01/11 15:37	08/03/11 18:06	7439-96-5	
Nickel	**6.5**	mg/kg	0.58	20	08/01/11 15:37	08/03/11 18:06	7440-02-0	
Zinc	**72.4**	mg/kg	5.8	20	08/01/11 15:37	08/03/11 18:06	7440-66-6	
7471 Mercury	Analytical Method: EPA 7471 Preparation Method: EPA 7471							
Mercury	**0.029**	mg/kg	0.021	1	07/28/11 19:33	07/31/11 13:11	7439-97-6	
Dry Weight	Analytical Method: % Moisture							
Percent Moisture	**14.5**	%	0.10	1		07/22/11 00:00		

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ANALYTICAL RESULTS

Project: Black Pine Mine REV
Pace Project No.: 10163483

Sample: BP-TS-RS-03-02 **Lab ID: 10163483004** Collected: 07/12/11 14:40 Received: 07/14/11 09:25 Matrix: Solid

Results reported on a "dry-weight" basis

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
6020 MET ICPMS	Analytical Method: EPA 6020 Preparation Method: EPA 3050							
Antimony	**712**	mg/kg	2.5	100	08/01/11 15:37	08/03/11 18:15	7440-36-0	
Arsenic	**868**	mg/kg	2.5	100	08/01/11 15:37	08/03/11 18:15	7440-38-2	
Barium	**186**	mg/kg	1.5	100	08/01/11 15:37	08/03/11 18:15	7440-39-3	
Cadmium	**6.0**	mg/kg	0.40	100	08/01/11 15:37	08/03/11 18:15	7440-43-9	
Chromium	**1.7**	mg/kg	0.50	20	08/01/11 15:37	08/03/11 18:12	7440-47-3	
Cobalt	**1.3**	mg/kg	0.50	20	08/01/11 15:37	08/03/11 18:12	7440-48-4	
Copper	**794**	mg/kg	2.5	100	08/01/11 15:37	08/03/11 18:15	7440-50-8	
Iron	**28100**	mg/kg	249	100	08/01/11 15:37	08/03/11 18:15	7439-89-6	
Lead	**3060**	mg/kg	2.0	400	08/01/11 15:37	08/04/11 13:49	7439-92-1	
Manganese	**125**	mg/kg	0.50	20	08/01/11 15:37	08/03/11 18:12	7439-96-5	
Nickel	**2.7**	mg/kg	2.5	100	08/01/11 15:37	08/03/11 18:15	7440-02-0	
Zinc	**144**	mg/kg	24.9	100	08/01/11 15:37	08/03/11 18:15	7440-66-6	
7471 Mercury	Analytical Method: EPA 7471 Preparation Method: EPA 7471							
Mercury	**2.1**	mg/kg	0.19	10	07/28/11 19:33	07/31/11 13:18	7439-97-6	
Dry Weight	Analytical Method: % Moisture							
Percent Moisture	**3.6**	%	0.10	1		07/22/11 00:00		
Sobek Acid Base Potential	Analytical Method: Modified Sobek 3.2							
Neutralization Potential	**<0.5**	tons/1000	0.50	1		08/02/11 00:00		
Sobek Extractable Sulfur	Analytical Method: Modified Sobek 3.2							
Sulfur, HCl Extractable	**<0.050**	% (w/w)	0.050	1		08/02/11 09:54		
Sulfur, HNO3 Extractable	**0.0625**	% (w/w)	0.050	1		08/02/11 09:54		
Sulfur, Hot Water Extractable	**0.0695**	% (w/w)	0.050	1		08/02/11 09:54		
Sulfur, Residual	**<0.050**	% (w/w)	0.050	1		08/02/11 09:54		
Total Sulfur	**0.161**	% (w/w)	0.050	1		08/02/11 09:54		
Sobek Calculations	Analytical Method: Modified Sobek 3.2							
Acid/Base Potential	**0**	tons/1000		1		08/02/11 00:00		
Acid Potential	**<4.3**	tons/1000	4.3	1		08/02/11 00:00		
Lime Requirement	**<5.4**	tons/1000	5.4	1		08/02/11 00:00		
SMP Lime Requirement	**1.0**	tons/1000	0.0	1		08/02/11 00:00		
Sobek SMP Buffer pH	Analytical Method: Modified Sobek 3.2							
SMP Buffer pH	**6.8**	Std. Units	0.10	1		07/26/11 09:40		

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ANALYTICAL RESULTS

Project: Black Pine Mine REV
Pace Project No.: 10163483

Sample: BP-TS-SS-02-02 **Lab ID: 10163483005** Collected: 07/12/11 15:24 Received: 07/14/11 09:25 Matrix: Solid

Results reported on a "dry-weight" basis

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
6020 MET ICPMS	Analytical Method: EPA 6020 Preparation Method: EPA 3050							
Antimony	**109**	mg/kg	0.54	20	08/01/11 15:37	08/03/11 18:18	7440-36-0	
Arsenic	**79.8**	mg/kg	0.54	20	08/01/11 15:37	08/03/11 18:18	7440-38-2	
Barium	**146**	mg/kg	0.32	20	08/01/11 15:37	08/03/11 18:18	7440-39-3	
Cadmium	**3.0**	mg/kg	0.086	20	08/01/11 15:37	08/03/11 18:18	7440-43-9	
Chromium	**4.1**	mg/kg	0.54	20	08/01/11 15:37	08/03/11 18:18	7440-47-3	
Cobalt	**3.0**	mg/kg	0.54	20	08/01/11 15:37	08/03/11 18:18	7440-48-4	
Copper	**189**	mg/kg	0.54	20	08/01/11 15:37	08/03/11 18:18	7440-50-8	
Iron	**7240**	mg/kg	53.6	20	08/01/11 15:37	08/03/11 18:18	7439-89-6	
Lead	**328**	mg/kg	0.11	20	08/01/11 15:37	08/03/11 18:18	7439-92-1	
Manganese	**325**	mg/kg	0.54	20	08/01/11 15:37	08/03/11 18:18	7439-96-5	
Nickel	**4.8**	mg/kg	0.54	20	08/01/11 15:37	08/03/11 18:18	7440-02-0	
Zinc	**56.6**	mg/kg	5.4	20	08/01/11 15:37	08/03/11 18:18	7440-66-6	
7471 Mercury	Analytical Method: EPA 7471 Preparation Method: EPA 7471							
Mercury	**1.0**	mg/kg	0.021	1	07/28/11 19:33	07/31/11 13:20	7439-97-6	
Dry Weight	Analytical Method: % Moisture							
Percent Moisture	**8.6**	%	0.10	1		07/22/11 00:00		

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ANALYTICAL RESULTS

Project: Black Pine Mine REV
Pace Project No.: 10163483

Sample: BP-TS-SS-08-01 **Lab ID: 10163483006** Collected: 07/13/11 08:32 Received: 07/14/11 09:25 Matrix: Solid

Results reported on a "dry-weight" basis

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
6020 MET ICPMS	Analytical Method: EPA 6020 Preparation Method: EPA 3050							
Antimony	**23.0**	mg/kg	0.55	20	08/01/11 15:37	08/03/11 15:34	7440-36-0	
Arsenic	**47.4**	mg/kg	2.8	100	08/01/11 15:37	08/03/11 15:38	7440-38-2	
Barium	**92.5**	mg/kg	0.33	20	08/01/11 15:37	08/03/11 15:34	7440-39-3	
Cadmium	**0.15**	mg/kg	0.089	20	08/01/11 15:37	08/03/11 15:34	7440-43-9	
Chromium	**17.8**	mg/kg	2.8	100	08/01/11 15:37	08/03/11 15:38	7440-47-3	
Cobalt	**9.3**	mg/kg	0.55	20	08/01/11 15:37	08/03/11 15:34	7440-48-4	
Copper	**63.0**	mg/kg	2.8	100	08/01/11 15:37	08/03/11 15:38	7440-50-8	
Iron	**21000**	mg/kg	277	100	08/01/11 15:37	08/03/11 15:38	7439-89-6	
Lead	**147**	mg/kg	0.11	20	08/01/11 15:37	08/03/11 15:34	7439-92-1	
Manganese	**109**	mg/kg	2.8	100	08/01/11 15:37	08/03/11 15:38	7439-96-5	
Nickel	**9.0**	mg/kg	2.8	100	08/01/11 15:37	08/03/11 15:38	7440-02-0	
Zinc	**62.1**	mg/kg	27.7	100	08/01/11 15:37	08/03/11 15:38	7440-66-6	
7471 Mercury	Analytical Method: EPA 7471 Preparation Method: EPA 7471							
Mercury	**0.15**	mg/kg	0.023	1	07/28/11 19:33	07/31/11 13:22	7439-97-6	
Dry Weight	Analytical Method: % Moisture							
Percent Moisture	**14.0**	%	0.10	1		07/22/11 00:00		

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ANALYTICAL RESULTS

Project: Black Pine Mine REV
Pace Project No.: 10163483

Sample: BP-TS-RS-07-04 **Lab ID: 10163483007** Collected: 07/13/11 08:49 Received: 07/14/11 09:25 Matrix: Solid

Results reported on a "dry-weight" basis

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
6020 MET ICPMS	Analytical Method: EPA 6020 Preparation Method: EPA 3050							
Antimony	**219**	mg/kg	0.54	20	08/01/11 15:14	08/04/11 03:08	7440-36-0	M6
Arsenic	**118**	mg/kg	0.54	20	08/01/11 15:14	08/04/11 03:08	7440-38-2	M6
Barium	**49.3**	mg/kg	0.33	20	08/01/11 15:14	08/04/11 03:08	7440-39-3	M6
Cadmium	**0.12**	mg/kg	0.087	20	08/01/11 15:14	08/04/11 03:08	7440-43-9	M6
Chromium	**5.4**	mg/kg	0.54	20	08/01/11 15:14	08/04/11 03:08	7440-47-3	M6
Cobalt	**2.5**	mg/kg	0.54	20	08/01/11 15:14	08/04/11 03:08	7440-48-4	
Copper	**31.3**	mg/kg	0.54	20	08/01/11 15:14	08/04/11 03:08	7440-50-8	M6
Iron	**17000**	mg/kg	54.4	20	08/01/11 15:14	08/04/11 03:08	7439-89-6	M6
Lead	**162**	mg/kg	0.11	20	08/01/11 15:14	08/04/11 03:08	7439-92-1	M6
Manganese	**67.6**	mg/kg	0.54	20	08/01/11 15:14	08/04/11 03:08	7439-96-5	M6
Nickel	**4.9**	mg/kg	0.54	20	08/01/11 15:14	08/04/11 03:08	7440-02-0	M6
Zinc	**18.6**	mg/kg	5.4	20	08/01/11 15:14	08/04/11 03:08	7440-66-6	M6
7471 Mercury	Analytical Method: EPA 7471 Preparation Method: EPA 7471							
Mercury	**1.1**	mg/kg	0.021	1	07/28/11 19:33	07/31/11 13:28	7439-97-6	
Dry Weight	Analytical Method: % Moisture							
Percent Moisture	**9.8**	%	0.10	1		07/22/11 00:00		
Sobek Acid Base Potential	Analytical Method: Modified Sobek 3.2							
Neutralization Potential	**0.72**	tons/1000	0.50	1		08/02/11 00:00		
Sobek Extractable Sulfur	Analytical Method: Modified Sobek 3.2							
Sulfur, HCl Extractable	**<0.050**	% (w/w)	0.050	1		08/02/11 10:40		
Sulfur, HNO3 Extractable	**<0.050**	% (w/w)	0.050	1		08/02/11 10:40		
Sulfur, Hot Water Extractable	**<0.050**	% (w/w)	0.050	1		08/02/11 10:40		
Sulfur, Residual	**<0.050**	% (w/w)	0.050	1		08/02/11 10:40		
Total Sulfur	**0.0920**	% (w/w)	0.050	1		08/02/11 10:40		
Sobek Calculations	Analytical Method: Modified Sobek 3.2							
Acid/Base Potential	**0.7**	tons/1000		1		08/02/11 00:00		
Acid Potential	**<4.3**	tons/1000	4.3	1		08/02/11 00:00		
Lime Requirement	**<5.4**	tons/1000	5.4	1		08/02/11 00:00		
SMP Lime Requirement	**0**	tons/1000	0.0	1		08/02/11 00:00		
Sobek SMP Buffer pH	Analytical Method: Modified Sobek 3.2							
SMP Buffer pH	**7.3**	Std. Units	0.10	1		07/26/11 09:40		

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ANALYTICAL RESULTS

Project: Black Pine Mine REV
Pace Project No.: 10163483

Sample: BP-TS-SS-07-01 **Lab ID: 10163483008** Collected: 07/13/11 08:55 Received: 07/14/11 09:25 Matrix: Solid

Results reported on a "dry-weight" basis

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
6020 MET ICPMS	Analytical Method: EPA 6020 Preparation Method: EPA 3050							
Antimony	**64.2**	mg/kg	0.54	20	08/01/11 15:14	08/04/11 04:01	7440-36-0	
Arsenic	**73.6**	mg/kg	0.54	20	08/01/11 15:14	08/04/11 04:01	7440-38-2	
Barium	**84.1**	mg/kg	0.32	20	08/01/11 15:14	08/04/11 04:01	7440-39-3	
Cadmium	**0.14**	mg/kg	0.086	20	08/01/11 15:14	08/04/11 04:01	7440-43-9	
Chromium	**10.1**	mg/kg	0.54	20	08/01/11 15:14	08/04/11 04:01	7440-47-3	
Cobalt	**3.6**	mg/kg	0.54	20	08/01/11 15:14	08/04/11 04:01	7440-48-4	
Copper	**28.2**	mg/kg	0.54	20	08/01/11 15:14	08/04/11 04:01	7440-50-8	
Iron	**14600**	mg/kg	53.9	20	08/01/11 15:14	08/04/11 04:01	7439-89-6	
Lead	**200**	mg/kg	0.11	20	08/01/11 15:14	08/04/11 04:01	7439-92-1	
Manganese	**217**	mg/kg	0.54	20	08/01/11 15:14	08/04/11 04:01	7439-96-5	
Nickel	**6.0**	mg/kg	0.54	20	08/01/11 15:14	08/04/11 04:01	7440-02-0	
Zinc	**36.3**	mg/kg	5.4	20	08/01/11 15:14	08/04/11 04:01	7440-66-6	
7471 Mercury	Analytical Method: EPA 7471 Preparation Method: EPA 7471							
Mercury	**0.69**	mg/kg	0.020	1	07/28/11 19:33	07/31/11 13:30	7439-97-6	
Dry Weight	Analytical Method: % Moisture							
Percent Moisture	**10.0**	%	0.10	1		07/22/11 00:00		

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ANALYTICAL RESULTS

Project: Black Pine Mine REV
Pace Project No.: 10163483

Sample: BP-HM-RS-08-02 **Lab ID: 10163483009** Collected: 07/13/11 09:30 Received: 07/14/11 09:25 Matrix: Solid

Results reported on a "dry-weight" basis

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
6020 MET ICPMS	Analytical Method: EPA 6020 Preparation Method: EPA 3050							
Antimony	**27.6**	mg/kg	0.45	20	08/01/11 15:14	08/04/11 04:05	7440-36-0	
Arsenic	**41.5**	mg/kg	0.45	20	08/01/11 15:14	08/04/11 04:05	7440-38-2	
Barium	**92.9**	mg/kg	0.27	20	08/01/11 15:14	08/04/11 04:05	7440-39-3	
Cadmium	**1.7**	mg/kg	0.073	20	08/01/11 15:14	08/04/11 04:05	7440-43-9	
Chromium	**12.3**	mg/kg	0.45	20	08/01/11 15:14	08/04/11 04:05	7440-47-3	
Cobalt	**8.5**	mg/kg	0.45	20	08/01/11 15:14	08/04/11 04:05	7440-48-4	
Copper	**329**	mg/kg	4.5	200	08/01/11 15:14	08/04/11 04:22	7440-50-8	
Iron	**12500**	mg/kg	45.5	20	08/01/11 15:14	08/04/11 04:05	7439-89-6	
Lead	**614**	mg/kg	0.91	200	08/01/11 15:14	08/04/11 04:22	7439-92-1	
Manganese	**412**	mg/kg	4.5	200	08/01/11 15:14	08/04/11 04:22	7439-96-5	
Nickel	**9.9**	mg/kg	0.45	20	08/01/11 15:14	08/04/11 04:05	7440-02-0	
Zinc	**191**	mg/kg	4.5	20	08/01/11 15:14	08/04/11 04:05	7440-66-6	
7471 Mercury	Analytical Method: EPA 7471 Preparation Method: EPA 7471							
Mercury	**0.57**	mg/kg	0.020	1	07/28/11 19:33	07/31/11 13:32	7439-97-6	
Dry Weight	Analytical Method: % Moisture							
Percent Moisture	**7.6**	%	0.10	1		07/22/11 00:00		
Sobek Acid Base Potential	Analytical Method: Modified Sobek 3.2							
Neutralization Potential	**6.0**	tons/1000	0.50	1		08/02/11 00:00		
Sobek Extractable Sulfur	Analytical Method: Modified Sobek 3.2							
Sulfur, HCl Extractable	**<0.050**	% (w/w)	0.050	1		08/02/11 10:53		
Sulfur, HNO3 Extractable	**<0.050**	% (w/w)	0.050	1		08/02/11 10:53		
Sulfur, Hot Water Extractable	**<0.050**	% (w/w)	0.050	1		08/02/11 10:53		
Sulfur, Residual	**<0.050**	% (w/w)	0.050	1		08/02/11 10:53		
Total Sulfur	**<0.050**	% (w/w)	0.050	1		08/02/11 10:53		
Sobek Calculations	Analytical Method: Modified Sobek 3.2							
Acid/Base Potential	**6.0**	tons/1000		1		08/02/11 00:00		
Acid Potential	**<4.3**	tons/1000	4.3	1		08/02/11 00:00		
Lime Requirement	**<5.4**	tons/1000	5.4	1		08/02/11 00:00		
SMP Lime Requirement	**1.0**	tons/1000	0.0	1		08/02/11 00:00		
Sobek SMP Buffer pH	Analytical Method: Modified Sobek 3.2							
SMP Buffer pH	**6.8**	Std. Units	0.10	1		07/26/11 09:40		

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ANALYTICAL RESULTS

Project: Black Pine Mine REV
Pace Project No.: 10163483

Sample: BP-HM-SS-15-00 **Lab ID: 10163483010** Collected: 07/13/11 09:45 Received: 07/14/11 09:25 Matrix: Solid

Results reported on a "dry-weight" basis

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
6020 MET ICPMS	Analytical Method: EPA 6020 Preparation Method: EPA 3050							
Antimony	**594**	mg/kg	5.1	200	08/01/11 15:14	08/04/11 04:26	7440-36-0	
Arsenic	**501**	mg/kg	5.1	200	08/01/11 15:14	08/04/11 04:26	7440-38-2	
Barium	**218**	mg/kg	0.31	20	08/01/11 15:14	08/04/11 04:10	7440-39-3	
Cadmium	**7.3**	mg/kg	0.082	20	08/01/11 15:14	08/04/11 04:10	7440-43-9	
Chromium	**3.1**	mg/kg	0.51	20	08/01/11 15:14	08/04/11 04:10	7440-47-3	
Cobalt	**0.63**	mg/kg	0.51	20	08/01/11 15:14	08/04/11 04:10	7440-48-4	
Copper	**505**	mg/kg	5.1	200	08/01/11 15:14	08/04/11 04:26	7440-50-8	
Iron	**27400**	mg/kg	511	200	08/01/11 15:14	08/04/11 04:26	7439-89-6	
Lead	**2050**	mg/kg	1.0	200	08/01/11 15:14	08/04/11 04:26	7439-92-1	
Manganese	**46.5**	mg/kg	0.51	20	08/01/11 15:14	08/04/11 04:10	7439-96-5	
Nickel	**2.0**	mg/kg	0.51	20	08/01/11 15:14	08/04/11 04:10	7440-02-0	
Zinc	**326**	mg/kg	5.1	20	08/01/11 15:14	08/04/11 04:10	7440-66-6	
7471 Mercury	Analytical Method: EPA 7471 Preparation Method: EPA 7471							
Mercury	**3.6**	mg/kg	0.20	10	07/28/11 19:33	07/31/11 13:47	7439-97-6	M6
Dry Weight	Analytical Method: % Moisture							
Percent Moisture	**8.5**	%	0.10	1		07/22/11 00:00		
Sobek Acid Base Potential	Analytical Method: Modified Sobek 3.2							
Neutralization Potential	**<0.5**	tons/1000	0.50	1		08/02/11 00:00		
Sobek Extractable Sulfur	Analytical Method: Modified Sobek 3.2							
Sulfur, HCl Extractable	**0.0746**	% (w/w)	0.050	1		08/02/11 11:32		
Sulfur, HNO3 Extractable	**0.175**	% (w/w)	0.050	1		08/02/11 11:32		
Sulfur, Hot Water Extractable	**<0.050**	% (w/w)	0.050	1		08/02/11 11:32		
Sulfur, Residual	**<0.050**	% (w/w)	0.050	1		08/02/11 11:32		
Total Sulfur	**0.183**	% (w/w)	0.050	1		08/02/11 11:32		
Sobek Calculations	Analytical Method: Modified Sobek 3.2							
Acid/Base Potential	**-7.5**	tons/1000		1		08/02/11 00:00		
Acid Potential	**7.5**	tons/1000	4.3	1		08/02/11 00:00		
Lime Requirement	**13**	tons/1000	5.4	1		08/02/11 00:00		
SMP Lime Requirement	**3.1**	tons/1000	0.0	1		08/02/11 00:00		
Sobek SMP Buffer pH	Analytical Method: Modified Sobek 3.2							
SMP Buffer pH	**6.5**	Std. Units	0.10	1		07/26/11 09:40		

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QUALITY CONTROL DATA

Project: Black Pine Mine REV
Pace Project No.: 10163483

QC Batch: MPRP/27166 Analysis Method: EPA 6020
QC Batch Method: EPA 3050 Analysis Description: 6020 MET
Associated Lab Samples: 10163483001, 10163483002, 10163483003, 10163483004, 10163483005, 10163483006

METHOD BLANK: 1014848 Matrix: Solid
Associated Lab Samples: 10163483001, 10163483002, 10163483003, 10163483004, 10163483005, 10163483006

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Antimony	mg/kg	<0.50	0.50	08/03/11 15:51	
Arsenic	mg/kg	<0.50	0.50	08/03/11 15:51	
Barium	mg/kg	<0.30	0.30	08/03/11 15:51	
Cadmium	mg/kg	<0.080	0.080	08/03/11 15:51	
Chromium	mg/kg	<0.50	0.50	08/03/11 15:51	
Cobalt	mg/kg	<0.50	0.50	08/03/11 15:51	
Copper	mg/kg	<0.50	0.50	08/03/11 15:51	
Iron	mg/kg	<50.0	50.0	08/03/11 15:51	
Lead	mg/kg	<0.10	0.10	08/03/11 15:51	
Manganese	mg/kg	<0.50	0.50	08/03/11 15:51	
Nickel	mg/kg	<0.50	0.50	08/03/11 15:51	
Zinc	mg/kg	<5.0	5.0	08/03/11 15:51	

LABORATORY CONTROL SAMPLE: 1014849

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Antimony	mg/kg	19.6	22.5	115	75-125	
Arsenic	mg/kg	19.6	22.1	112	75-125	
Barium	mg/kg	19.6	22.6	115	75-125	
Cadmium	mg/kg	19.6	22.2	113	75-125	
Chromium	mg/kg	19.6	22.5	115	75-125	
Cobalt	mg/kg	19.6	24.0	123	75-125	
Copper	mg/kg	19.6	23.8	121	75-125	
Iron	mg/kg	245	285	116	75-125	
Lead	mg/kg	19.6	22.5	115	75-125	
Manganese	mg/kg	19.6	23.3	119	75-125	
Nickel	mg/kg	19.6	24.2	123	75-125	
Zinc	mg/kg	19.6	21.6	110	75-125	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 1014850 1014851

Parameter	Units	10163633001 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Antimony	mg/kg	1380	21.8	22	1430	1420	262	211	75-125	.7	20	M6
Arsenic	mg/kg	1380	21.8	22	1280	1150	-425	-1040	75-125	11	20	M6
Barium	mg/kg	247	21.8	22	281	258	157	49	75-125	9	20	M6
Cadmium	mg/kg	20.6	21.8	22	68.3	69.0	219	220	75-125	1	20	M6
Chromium	mg/kg	2.7	21.8	22	55.3	54.0	241	233	75-125	2	20	M6
Cobalt	mg/kg	1.1	21.8	22	50.3	50.0	226	222	75-125	.6	20	
Copper	mg/kg	1280	21.8	22	1160	1200	-545	-356	75-125	3	20	M6

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QUALITY CONTROL DATA

Project: Black Pine Mine REV
Pace Project No.: 10163483

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 1014850 1014851

Parameter	Units	10163633001 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Iron	mg/kg	23100	273	275	21700	20600	-513	-892	75-125	5	20	M6
Lead	mg/kg	6960	21.8	22	6940	7420	-79	2100	75-125	7	20	M6
Manganese	mg/kg	270	21.8	22	332	246	283	-111	75-125	30	20	D6,M6
Nickel	mg/kg	<2.8	21.8	22	50.8	51.5	225	226	75-125	1	20	M6
Zinc	mg/kg	332	21.8	22	432	364	460	145	75-125	17	20	M6

MATRIX SPIKE SAMPLE: 1014852

Parameter	Units	10163633011 Result	Spike Conc.	MS Result	MS % Rec	% Rec Limits	Qualifiers
Antimony	mg/kg	765	19.8	907	714	75-125	M6
Arsenic	mg/kg	515	19.8	2180	8400	75-125	M6
Barium	mg/kg	168	19.8	214	232	75-125	M6
Cadmium	mg/kg	14.9	19.8	63.6	246	75-125	M6
Chromium	mg/kg	4.1	19.8	52.7	245	75-125	M6
Cobalt	mg/kg	2.5	19.8	50.1	240	75-125	
Copper	mg/kg	1690	19.8	1970	1410	75-125	M6
Iron	mg/kg	14400	247	15900	623	75-125	M6
Lead	mg/kg	3820	19.8	7060	16400	75-125	M6
Manganese	mg/kg	652	19.8	586	-333	75-125	M6
Nickel	mg/kg	3.9	19.8	52.1	243	75-125	M6
Zinc	mg/kg	1150	19.8	1220	402	75-125	M6

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QUALITY CONTROL DATA

Project: Black Pine Mine REV
Pace Project No.: 10163483

QC Batch: MPRP/27167 Analysis Method: EPA 6020
QC Batch Method: EPA 3050 Analysis Description: 6020 MET
Associated Lab Samples: 10163483007, 10163483008, 10163483009, 10163483010

METHOD BLANK: 1014853 Matrix: Solid
Associated Lab Samples: 10163483007, 10163483008, 10163483009, 10163483010

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Antimony	mg/kg	<0.49	0.49	08/04/11 03:04	
Arsenic	mg/kg	<0.49	0.49	08/04/11 03:04	
Barium	mg/kg	<0.29	0.29	08/04/11 03:04	
Cadmium	mg/kg	<0.078	0.078	08/04/11 03:04	
Chromium	mg/kg	<0.49	0.49	08/04/11 03:04	
Cobalt	mg/kg	<0.49	0.49	08/04/11 03:04	
Copper	mg/kg	<0.49	0.49	08/04/11 03:04	
Iron	mg/kg	<49.0	49.0	08/04/11 03:04	
Lead	mg/kg	<0.098	0.098	08/04/11 03:04	
Manganese	mg/kg	<0.49	0.49	08/04/11 03:04	
Nickel	mg/kg	<0.49	0.49	08/04/11 03:04	
Zinc	mg/kg	<4.9	4.9	08/04/11 03:04	

LABORATORY CONTROL SAMPLE: 1014854

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Antimony	mg/kg	20	18.2	91	75-125	
Arsenic	mg/kg	20	18.3	92	75-125	
Barium	mg/kg	20	18.1	90	75-125	
Cadmium	mg/kg	20	18.4	92	75-125	
Chromium	mg/kg	20	18.8	94	75-125	
Cobalt	mg/kg	20	18.7	94	75-125	
Copper	mg/kg	20	18.9	94	75-125	
Iron	mg/kg	250	233	93	75-125	
Lead	mg/kg	20	18.8	94	75-125	
Manganese	mg/kg	20	18.4	92	75-125	
Nickel	mg/kg	20	18.8	94	75-125	
Zinc	mg/kg	20	18.8	94	75-125	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 1014855 1014856

Parameter	Units	10163483007 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Antimony	mg/kg	219	21.7	21.7	178	148	-190	-328	75-125	18	20	M6
Arsenic	mg/kg	118	21.7	21.7	202	156	386	173	75-125	26	20	D6,M6
Barium	mg/kg	49.3	21.7	21.7	115	113	302	293	75-125	2	20	M6
Cadmium	mg/kg	0.12	21.7	21.7	54.2	53.7	249	246	75-125	.9	20	M6
Chromium	mg/kg	5.4	21.7	21.7	61.4	62.0	258	260	75-125	1	20	M6
Cobalt	mg/kg	2.5	21.7	21.7	57.8	56.1	254	246	75-125	3	20	
Copper	mg/kg	31.3	21.7	21.7	88.5	89.2	263	266	75-125	.8	20	M6

REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL DATA

Project: Black Pine Mine REV
Pace Project No.: 10163483

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 1014855 1014856

Parameter	Units	10163483007 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Iron	mg/kg	17000	272	272	15300	15900	-622	-408	75-125	4	20	M6
Lead	mg/kg	162	21.7	21.7	230	269	311	490	75-125	16	20	M6
Manganese	mg/kg	67.6	21.7	21.7	169	115	467	220	75-125	38	20	D6,M6
Nickel	mg/kg	4.9	21.7	21.7	57.6	57.7	243	243	75-125	.04	20	M6
Zinc	mg/kg	18.6	21.7	21.7	76.5	80.9	266	287	75-125	6	20	M6

MATRIX SPIKE SAMPLE: 1014857

Parameter	Units	10163634007 Result	Spike Conc.	MS Result	MS % Rec	% Rec Limits	Qualifiers
Antimony	mg/kg	3.3	19.6	41.0	192	75-125	M6
Arsenic	mg/kg	14.4	19.6	69.2	279	75-125	M6
Barium	mg/kg	64.7	19.6	230	841	75-125	M6
Cadmium	mg/kg	1.6	19.6	59.5	295	75-125	M6
Chromium	mg/kg	7.6	19.6	69.5	316	75-125	M6
Cobalt	mg/kg	8.2	19.6	72.2	326	75-125	
Copper	mg/kg	220	19.6	263	220	75-125	M6
Iron	mg/kg	11000	245	13400	1010	75-125	M6
Lead	mg/kg	24.4	19.6	96.1	365	75-125	M6
Manganese	mg/kg	419	19.6	838	2130	75-125	M6
Nickel	mg/kg	4.8	19.6	62.7	295	75-125	M6
Zinc	mg/kg	101	19.6	169	345	75-125	M6

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QUALITY CONTROL DATA

Project: Black Pine Mine REV
Pace Project No.: 10163483

QC Batch: MERP/5632 Analysis Method: EPA 7471
QC Batch Method: EPA 7471 Analysis Description: 7471 Mercury
Associated Lab Samples: 10163483001, 10163483002, 10163483003, 10163483004, 10163483005, 10163483006, 10163483007, 10163483008, 10163483009, 10163483010

METHOD BLANK: 1014982 Matrix: Solid
Associated Lab Samples: 10163483001, 10163483002, 10163483003, 10163483004, 10163483005, 10163483006, 10163483007, 10163483008, 10163483009, 10163483010

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Mercury	mg/kg	<0.020	0.020	07/31/11 12:13	

LABORATORY CONTROL SAMPLE: 1014983

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Mercury	mg/kg	.48	0.48	100	80-120	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 1014984 1014985

Parameter	Units	10163246001 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Mercury	mg/kg	0.14	.51	.51	0.30	0.34	31	38	80-120	11	20	M1

MATRIX SPIKE SAMPLE: 1014986

Parameter	Units	10163483010 Result	Spike Conc.	MS Result	MS % Rec	% Rec Limits	Qualifiers
Mercury	mg/kg	3.6	.49	4.6	208	80-120	M6

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QUALITY CONTROL DATA

Project: Black Pine Mine REV
Pace Project No.: 10163483

QC Batch: MPRP/27276 Analysis Method: % Moisture
QC Batch Method: % Moisture Analysis Description: Dry Weight/Percent Moisture
Associated Lab Samples: 10163483001, 10163483002, 10163483003, 10163483004, 10163483005, 10163483006, 10163483007, 10163483008, 10163483009, 10163483010

SAMPLE DUPLICATE: 1018378

Parameter	Units	10163859001 Result	Dup Result	RPD	Max RPD	Qualifiers
Percent Moisture	%	21.9	19.8	10	30	

SAMPLE DUPLICATE: 1018405

Parameter	Units	10164124001 Result	Dup Result	RPD	Max RPD	Qualifiers
Percent Moisture	%	13.0	11.5	12	30	

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QUALITY CONTROL DATA

Project: Black Pine Mine REV
Pace Project No.: 10163483

QC Batch: MT/6496 Analysis Method: Modified Sobek 3.2
QC Batch Method: Modified Sobek 3.2 Analysis Description: Sobek Acid Base Potential
Associated Lab Samples: 10163483001, 10163483004, 10163483007, 10163483009, 10163483010

METHOD BLANK: 1020547 Matrix: Solid
Associated Lab Samples: 10163483001, 10163483004, 10163483007, 10163483009, 10163483010

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Neutralization Potential	tons/1000	<0.5	0.50	08/02/11 00:00	

SAMPLE DUPLICATE: 1020546

Parameter	Units	10163635003 Result	Dup Result	RPD	Max RPD	Qualifiers
Neutralization Potential	tons/1000	<0.5	0.97			

SAMPLE DUPLICATE: 1020548

Parameter	Units	10163633009 Result	Dup Result	RPD	Max RPD	Qualifiers
Neutralization Potential	tons/1000	<0.5	6.5			

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QUALITY CONTROL DATA

Project: Black Pine Mine REV
Pace Project No.: 10163483

QC Batch: MT/6487 Analysis Method: Modified Sobek 3.2
QC Batch Method: Modified Sobek 3.2 Analysis Description: Sobek Extractable Sulfur
Associated Lab Samples: 10163483001, 10163483004, 10163483007, 10163483009, 10163483010

METHOD BLANK: 1019970 Matrix: Solid
Associated Lab Samples: 10163483001, 10163483004, 10163483007, 10163483009, 10163483010

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Total Sulfur	% (w/w)	<0.050	0.050	08/01/11 13:07	

SAMPLE DUPLICATE: 1019972

Parameter	Units	10163635003 Result	Dup Result	RPD	Max RPD	Qualifiers
Total Sulfur	% (w/w)	<0.050	<0.050			

SAMPLE DUPLICATE: 1019973

Parameter	Units	10163633008 Result	Dup Result	RPD	Max RPD	Qualifiers
Total Sulfur	% (w/w)	0.369	0.428	15		

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QUALITY CONTROL DATA

Project: Black Pine Mine REV
Pace Project No.: 10163483

QC Batch: MT/6542 Analysis Method: Modified Sobek 3.2
QC Batch Method: Modified Sobek 3.2 Analysis Description: Sobek SMP Buffer pH
Associated Lab Samples: 10163483001, 10163483004, 10163483007, 10163483009, 10163483010

SAMPLE DUPLICATE: 1022810

Parameter	Units	10163635003 Result	Dup Result	RPD	Max RPD	Qualifiers
SMP Buffer pH	Std. Units	6.4	6.4	.3	20	

SAMPLE DUPLICATE: 1026467

Parameter	Units	10163633008 Result	Dup Result	RPD	Max RPD	Qualifiers
SMP Buffer pH	Std. Units	7.4	7.4	.1	20	

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QUALIFIERS

Project: Black Pine Mine REV
Pace Project No.: 10163483

DEFINITIONS

DF - Dilution Factor, if reported, represents the factor applied to the reported data due to changes in sample preparation, dilution of the sample aliquot, or moisture content.

ND - Not Detected at or above adjusted reporting limit.

J - Estimated concentration above the adjusted method detection limit and below the adjusted reporting limit.

MDL - Adjusted Method Detection Limit.

S - Surrogate

1,2-Diphenylhydrazine (8270 listed analyte) decomposes to Azobenzene.

Consistent with EPA guidelines, unrounded data are displayed and have been used to calculate % recovery and RPD values.

LCS(D) - Laboratory Control Sample (Duplicate)

MS(D) - Matrix Spike (Duplicate)

DUP - Sample Duplicate

RPD - Relative Percent Difference

NC - Not Calculable.

SG - Silica Gel - Clean-Up

U - Indicates the compound was analyzed for, but not detected.

N-Nitrosodiphenylamine decomposes and cannot be separated from Diphenylamine using Method 8270. The result reported for each analyte is a combined concentration.

LABORATORIES

PASI-M	Pace Analytical Services - Minneapolis
PASI-MT	Pace Analytical Services - Montana

ANALYTE QUALIFIERS

D6	The relative percent difference (RPD) between the sample and sample duplicate exceeded laboratory control limits.
M1	Matrix spike recovery exceeded QC limits. Batch accepted based on laboratory control sample (LCS) recovery.
M6	Matrix spike and Matrix spike duplicate recovery not evaluated against control limits due to sample dilution.

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QUALITY CONTROL DATA CROSS REFERENCE TABLE

Project: Black Pine Mine REV
Pace Project No.: 10163483

Lab ID	Sample ID	QC Batch Method	QC Batch	Analytical Method	Analytical Batch
10163483001	**BP-TS-RS-01-04**	EPA 3050	MPRP/27166	EPA 6020	ICPM/11156
10163483002	**BP-TS-SS-01-06**	EPA 3050	MPRP/27166	EPA 6020	ICPM/11156
10163483003	**BP-TS-SS-03-03**	EPA 3050	MPRP/27166	EPA 6020	ICPM/11156
10163483004	**BP-TS-RS-03-02**	EPA 3050	MPRP/27166	EPA 6020	ICPM/11156
10163483005	**BP-TS-SS-02-02**	EPA 3050	MPRP/27166	EPA 6020	ICPM/11156
10163483006	**BP-TS-SS-08-01**	EPA 3050	MPRP/27166	EPA 6020	ICPM/11156
10163483007	**BP-TS-RS-07-04**	EPA 3050	MPRP/27167	EPA 6020	ICPM/11153
10163483008	**BP-TS-SS-07-01**	EPA 3050	MPRP/27167	EPA 6020	ICPM/11153
10163483009	**BP-HM-RS-08-02**	EPA 3050	MPRP/27167	EPA 6020	ICPM/11153
10163483010	**BP-HM-SS-15-00**	EPA 3050	MPRP/27167	EPA 6020	ICPM/11153
10163483001	**BP-TS-RS-01-04**	EPA 7471	MERP/5632	EPA 7471	MERC/6492
10163483002	**BP-TS-SS-01-06**	EPA 7471	MERP/5632	EPA 7471	MERC/6492
10163483003	**BP-TS-SS-03-03**	EPA 7471	MERP/5632	EPA 7471	MERC/6492
10163483004	**BP-TS-RS-03-02**	EPA 7471	MERP/5632	EPA 7471	MERC/6492
10163483005	**BP-TS-SS-02-02**	EPA 7471	MERP/5632	EPA 7471	MERC/6492
10163483006	**BP-TS-SS-08-01**	EPA 7471	MERP/5632	EPA 7471	MERC/6492
10163483007	**BP-TS-RS-07-04**	EPA 7471	MERP/5632	EPA 7471	MERC/6492
10163483008	**BP-TS-SS-07-01**	EPA 7471	MERP/5632	EPA 7471	MERC/6492
10163483009	**BP-HM-RS-08-02**	EPA 7471	MERP/5632	EPA 7471	MERC/6492
10163483010	**BP-HM-SS-15-00**	EPA 7471	MERP/5632	EPA 7471	MERC/6492
10163483001	**BP-TS-RS-01-04**	% Moisture	MPRP/27276		
10163483002	**BP-TS-SS-01-06**	% Moisture	MPRP/27276		
10163483003	**BP-TS-SS-03-03**	% Moisture	MPRP/27276		
10163483004	**BP-TS-RS-03-02**	% Moisture	MPRP/27276		
10163483005	**BP-TS-SS-02-02**	% Moisture	MPRP/27276		
10163483006	**BP-TS-SS-08-01**	% Moisture	MPRP/27276		
10163483007	**BP-TS-RS-07-04**	% Moisture	MPRP/27276		
10163483008	**BP-TS-SS-07-01**	% Moisture	MPRP/27276		
10163483009	**BP-HM-RS-08-02**	% Moisture	MPRP/27276		
10163483010	**BP-HM-SS-15-00**	% Moisture	MPRP/27276		
10163483001	**BP-TS-RS-01-04**	Modified Sobek 3.2	MT/6496		
10163483004	**BP-TS-RS-03-02**	Modified Sobek 3.2	MT/6496		
10163483007	**BP-TS-RS-07-04**	Modified Sobek 3.2	MT/6496		
10163483009	**BP-HM-RS-08-02**	Modified Sobek 3.2	MT/6496		
10163483010	**BP-HM-SS-15-00**	Modified Sobek 3.2	MT/6496		
10163483001	**BP-TS-RS-01-04**	Modified Sobek 3.2	MT/6487		
10163483004	**BP-TS-RS-03-02**	Modified Sobek 3.2	MT/6487		
10163483007	**BP-TS-RS-07-04**	Modified Sobek 3.2	MT/6487		
10163483009	**BP-HM-RS-08-02**	Modified Sobek 3.2	MT/6487		
10163483010	**BP-HM-SS-15-00**	Modified Sobek 3.2	MT/6487		
10163483001	**BP-TS-RS-01-04**	Modified Sobek 3.2	MT/6500		
10163483004	**BP-TS-RS-03-02**	Modified Sobek 3.2	MT/6500		
10163483007	**BP-TS-RS-07-04**	Modified Sobek 3.2	MT/6500		
10163483009	**BP-HM-RS-08-02**	Modified Sobek 3.2	MT/6500		
10163483010	**BP-HM-SS-15-00**	Modified Sobek 3.2	MT/6500		

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QUALITY CONTROL DATA CROSS REFERENCE TABLE

Project: Black Pine Mine REV
Pace Project No.: 10163483

Lab ID	Sample ID	QC Batch Method	QC Batch	Analytical Method	Analytical Batch
10163483001	**BP-TS-RS-01-04**	Modified Sobek 3.2	MT/6542		
10163483004	**BP-TS-RS-03-02**	Modified Sobek 3.2	MT/6542		
10163483007	**BP-TS-RS-07-04**	Modified Sobek 3.2	MT/6542		
10163483009	**BP-HM-RS-08-02**	Modified Sobek 3.2	MT/6542		
10163483010	**BP-HM-SS-15-00**	Modified Sobek 3.2	MT/6542		

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CHAIN-OF-CUSTODY / Analytical Request Document

The Chain-of-Custody is a LEGAL DOCUMENT. All relevant fields must be completed accurately.

Page: 1 of

1429997

Section A Required Client Information:

Company: Herrera	
Address:	
Email To: KhouckCherreraInc.com	
Phone:	Fax:
Requested Due Date/TAT:	

Section B Required Project Information:

Report To: Kevin Houck	
Copy To:	
Purchase Order No.:	
Project Name: Black Pine Mine	
Project Number:	

Section C Invoice Information:

Attention:	
Company Name: DEQ	
Address:	
Pace Quote Reference:	
Pace Project Manager:	
Pace Profile #:	

REGULATORY AGENCY

☐ NPDES ☐ GROUND WATER ☐ DRINKING WATER

☐ UST ☐ RCRA ☐ OTHER _____

Site Location STATE: _____

Section D Required Client Information

SAMPLE ID (A-Z, 0-9 / ,-) Sample IDs MUST BE UNIQUE

Matrix Codes — MATRIX / CODE: Drinking Water DW; Water WT; Waste Water WW; Product P; Soil/Solid SL; Oil OL; Wipe WP; Air AR; Tissue TS; Other OT

Requested Analysis Filtered (Y/N)

ITEM #	SAMPLE ID	MATRIX CODE (see valid codes to left)	SAMPLE TYPE (G=GRAB C=COMP)	COLLECTED COMPOSITE START DATE	COMPOSITE START TIME	COMPOSITE END/GRAB DATE	COMPOSITE END/GRAB TIME	SAMPLE TEMP AT COLLECTION	# OF CONTAINERS	Preservatives: Unpreserved	H_2SO_4	HNO_3	HCl	NaOH	$Na_2S_2O_3$	Methanol	Other	Analysis Test Y/N	Total Met. ABA	Residual Chlorine (Y/N)	Pace Project No./ Lab I.D.
1	BP-TS-RS-01-04	SL	C			7/12/11	1408		2	X									X	X	001
2	BP-TS-SS-01-06	SL	G			7/12/11	1410		1	X									X		002
3	BP-TS-SS-03-03	SL	G			↓	1436		1	X									X		003
4	BP-TS-RS-03-02	SL	C			↓	1440		2	X									X	X	004
5	BP-TS-SS-02-02	SL	G			7/12/11	1524		1	X									X		005
6	BP-TS-SS-08-01	SL	G			7/13/11	0832		1	X									X		006
7	BP-TS-RS-07-04	↓	C	qp		↓	0849		2	X									X	X	007
8	BP-TS-SS-07-01	↓	G			↓	0855		1	X									X		008
9	BP-HM-RS-08-02	SL	C			7/13/11	0930		2	X									X	X	009
10	BP-HM-SS-15-00	SL	G			7/13/11	0945		1	X									X		010
11																					
12																					

Tot. Recoverable Metals = Sb, As, Ba, Cd, Cr, Co, Fe, Pb, Mn, Hg, Ni, Zn - 10116348

ADDITIONAL COMMENTS	RELINQUISHED BY / AFFILIATION	DATE	TIME	ACCEPTED BY / AFFILIATION	DATE	TIME	SAMPLE CONDITIONS			
	HJ Cyt / HEC	7/13/11	1500		7/13/11	3:00				
	Fed Ex (G)	7/14/11	0925	Ken Feeth, Pace	7/14/11	0925	3.1	Y	Y	Y

ORIGINAL

SAMPLER NAME AND SIGNATURE

PRINT Name of SAMPLER:

SIGNATURE of SAMPLER: DATE Signed (MM/DD/YY):

Temp in °C | Received on Ice (Y/N) | Custody Sealed Cooler (Y/N) | Samples Intact (Y/N)

*Important Note: By signing this form you are accepting Pace's NET 30 day payment terms and agreeing to late charges of 1.5% per month for any invoices not paid within 30 days.

F-ALL-Q-020rev.07, 15-May-2007

Sample Condition Upon Receipt

Pace Analytical

Client Name: Herrera

Project # 10163483

Courier: ☒ Fed Ex ☐ UPS ☐ USPS ☐ Client ☐ Commercial ☐ Pace Other _____

Tracking #: 8797184 6001 5282

Custody Seal on Cooler/Box Present: ☒ yes ☐ no Seals intact: ☒ yes ☐ no

Packing Material: ☐ Bubble Wrap ☐ Bubble Bags ☐ None ☐ Other _____ Temp Blank: Yes ____ No X

Thermometer Used 1383048 or 135 Type of Ice: (Wet) Blue None ☒ Samples on ice, cooling process has begun

Cooler Temperature 3.1 Biological Tissue is Frozen: Yes No

Date and Initials of person examining contents: 7/14/11 BN

Temp should be above freezing to 6°C

		Comments:
Chain of Custody Present:	☒Yes ☐No ☐N/A	1.
Chain of Custody Filled Out:	☒Yes ☐No ☐N/A	2.
Chain of Custody Relinquished:	☒Yes ☐No ☐N/A	3.
Sampler Name & Signature on COC:	☐Yes ☒No ☐N/A	4. There was not a Sampler name on CoC
Samples Arrived within Hold Time:	☒Yes ☐No ☐N/A	5.
Short Hold Time Analysis (<72hr):	☐Yes ☒No ☐N/A	6.
Rush Turn Around Time Requested:	☐Yes ☒No ☐N/A	7.
Sufficient Volume:	☒Yes ☐No ☐N/A	8.
Correct Containers Used:	☒Yes ☐No ☐N/A	9. PB
-Pace Containers Used:	☒Yes ☐No ☐N/A	
Containers Intact:	☒Yes ☐No ☐N/A	10.
Filtered volume received for Dissolved tests	☐Yes ☒No ☐N/A	11.
Sample Labels match COC:	☐Yes ☒No ☐N/A	12. COC Does not include PB samples
-Includes date/time/ID/Analysis Matrix: SL		7/15/11 Por 090
All containers needing acid/base preservation have been checked. Noncompliance are noted in 13.	☐Yes ☐No ☒N/A	13. ☐ HNO3 ☐ H2SO4 ☐ NaOH ☐ HCl
All containers needing preservation are found to be in compliance with EPA recommendation.	☐Yes ☐No ☒N/A	Samp #
Exceptions: VOA,Coliform, TOC, Oil and Grease, WI-DRO (water)	☐Yes ☐No MF	Initial when completed / Lot # of added preservative
Samples checked for dechlorination:	☐Yes ☐No ☒N/A	14.
Headspace in VOA Vials (>6mm):	☐Yes ☐No ☒N/A	15.
Trip Blank Present: 7/15/11	☐Yes ☒No ☐N/A	16.
Trip Blank Custody Seals Present	☒Yes ☐No ☐N/A	
Pace Trip Blank Lot # (if purchased): NA 7/15/11		

Client Notification/ Resolution: Field Data Required? Y / N

Person Contacted: _____ Date/Time: _____

Comments/ Resolution: _____

Project Manager Review: _____ **Date:** 7/15/11

Note: Whenever there is a discrepancy affecting North Carolina compliance samples, a copy of this form will be sent to the North Carolina DEHNR Certification Office (i.e out of hold, incorrect preservative, out of temp, incorrect containers)

Pace Analytical Services, Inc.
602 S 25th Street
Billings, MT 591014549
(406)254-7226

October 13, 2011

Kevin Houck
Herrera Environmental Consultants
101 East Broadway, Suite 610
Missoula, MT 59802

RE: Project: Black Pine Mine REV
Pace Project No.: 10163606

Dear Kevin Houck:
Enclosed are the analytical results for sample(s) received by the laboratory on July 14, 2011. The results relate only to the samples included in this report.

This report has been revised to add Cobalt and delete Silver.

If you have any questions concerning this report, please feel free to contact me.

Sincerely,

Carol Davy for
Sally Heinje
sally.heinje@pacelabs.com
Project Manager

Enclosures

cc: Devin Clary, Montana Dept. of Environmental Quality
Mark Donner, Trihydro
Jamie Mongoven, Montana Dept. of Environmental

REPORT OF LABORATORY ANALYSIS

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CERTIFICATIONS

Project: Black Pine Mine REV
Pace Project No.: 10163606

Minnesota Certification IDs

1700 Elm Street SE Suite 200, Minneapolis, MN 55414
A2LA Certification #: 2926.01
Alaska Certification #: UST-078
Alaska Certification #MN00064
Arizona Certification #: AZ-0014
Arkansas Certification #: 88-0680
California Certification #: 01155CA
EPA Region 8 Certification #: Pace
Florida/NELAP Certification #: E87605
Georgia Certification #: 959
Idaho Certification #: MN00064
Illinois Certification #: 200011
Iowa Certification #: 368
Kansas Certification #: E-10167
Louisiana Certification #: 03086
Louisiana Certification #: LA080009
Maine Certification #: 2007029
Maryland Certification #: 322
Michigan DEQ Certification #: 9909
Minnesota Certification #: 027-053-137
Mississippi Certification #: Pace
Montana Certification #: MT CERT0092
Nevada Certification #: MN_00064
Nebraska Certification #: Pace
New Jersey Certification #: MN-002
New Mexico Certification #: Pace
New York Certification #: 11647
North Carolina Certification #: 530
North Dakota Certification #: R-036
North Dakota Certification #: R-036A
Ohio VAP Certification #: CL101
Oklahoma Certification #: D9921
Oklahoma Certification #: 9507
Oregon Certification #: MN200001
Pennsylvania Certification #: 68-00563
Puerto Rico Certification
Tennessee Certification #: 02818
Texas Certification #: T104704192
Washington Certification #: C754
Wisconsin Certification #: 999407970

Montana Certification IDs

602 South 25th Street, Billings, MT 59101
EPA Region 8 Certification #: 8TMS-Q
Idaho Certification #: MT00012
Montana Certification #: MT CERT0040
NVLAP Certification #: 101292-0
Minnesota Dept of Health Certification #: 030-999-442

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SAMPLE SUMMARY

Project: Black Pine Mine REV
Pace Project No.: 10163606

Lab ID	Sample ID	Matrix	Date Collected	Date Received
10163606001	**BP-HM-SS-03-03**	Solid	07/13/11 10:10	07/14/11 09:25
10163606002	**BP-HM-RS-03-01**	Solid	07/13/11 10:15	07/14/11 09:25
10163606003	**BP-HM-SS-04-10**	Solid	07/13/11 11:30	07/14/11 09:25
10163606004	**BP-HM-RS-04-07**	Solid	07/13/11 11:35	07/14/11 09:25
10163606005	**BP-QC-WT-T1**	Water	07/13/11 12:20	07/14/11 09:25
10163606006	**BP-HM-RS-01-16.5**	Solid	07/13/11 12:45	07/14/11 09:25
10163606007	**BP-HM-RS-01-08**	Solid	07/13/11 13:15	07/14/11 09:25
10163606008	**BP-HM-RS-02-01**	Solid	07/13/11 13:50	07/14/11 09:25
10163606009	**BP-HM-RS-02-03**	Solid	07/13/11 13:55	07/14/11 09:25

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SAMPLE ANALYTE COUNT

Project: Black Pine Mine REV
Pace Project No.: 10163606

Lab ID	Sample ID	Method	Analysts	Analytes Reported	Laboratory
10163606001	**BP-HM-SS-03-03**	EPA 6020	CJS	12	PASI-M
		EPA 7471	TEM	1	PASI-M
		% Moisture	JDL	1	PASI-M
10163606002	**BP-HM-RS-03-01**	EPA 6020	CJS	12	PASI-M
		EPA 7471	TEM	1	PASI-M
		% Moisture	JDL	1	PASI-M
		Modified Sobek 3.2	JH1	1	PASI-MT
		Modified Sobek 3.2	JH1	5	PASI-MT
		Modified Sobek 3.2	JH1	4	PASI-MT
		Modified Sobek 3.2	JH1	1	PASI-MT
10163606003	**BP-HM-SS-04-10**	EPA 6020	CJS	12	PASI-M
		EPA 7471	TEM	1	PASI-M
		% Moisture	JDL	1	PASI-M
10163606004	**BP-HM-RS-04-07**	EPA 6020	CJS	12	PASI-M
		EPA 7471	TEM	1	PASI-M
		% Moisture	JDL	1	PASI-M
		Modified Sobek 3.2	JH1	1	PASI-MT
		Modified Sobek 3.2	JH1	5	PASI-MT
		Modified Sobek 3.2	JH1	4	PASI-MT
		Modified Sobek 3.2	JH1	1	PASI-MT
10163606005	**BP-QC-WT-T1**	EPA 200.8	CJS	12	PASI-M
		EPA 7470	TEM	1	PASI-M
10163606006	**BP-HM-RS-01-16.5**	EPA 6020	CJS	12	PASI-M
		EPA 7471	TEM	1	PASI-M
		% Moisture	JDL	1	PASI-M
10163606007	**BP-HM-RS-01-08**	EPA 6020	CJS	12	PASI-M
		EPA 7471	TEM	1	PASI-M
		% Moisture	JDL	1	PASI-M
		Modified Sobek 3.2	JH1	1	PASI-MT
		Modified Sobek 3.2	JH1	5	PASI-MT
		Modified Sobek 3.2	JH1	4	PASI-MT
		Modified Sobek 3.2	JH1	1	PASI-MT
10163606008	**BP-HM-RS-02-01**	EPA 6020	CJS	12	PASI-M
		EPA 7471	TEM	1	PASI-M
		% Moisture	JDL	1	PASI-M
		Modified Sobek 3.2	JH1	1	PASI-MT
		Modified Sobek 3.2	JH1	5	PASI-MT

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SAMPLE ANALYTE COUNT

Project: Black Pine Mine REV
Pace Project No.: 10163606

Lab ID	Sample ID	Method	Analysts	Analytes Reported	Laboratory
		Modified Sobek 3.2	JH1	4	PASI-MT
		Modified Sobek 3.2	JH1	1	PASI-MT
10163606009	**BP-HM-RS-02-03**	EPA 6020	CJS	12	PASI-M
		EPA 7471	TEM	1	PASI-M
		% Moisture	JDL	1	PASI-M

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PROJECT NARRATIVE

Project: Black Pine Mine REV
Pace Project No.: 10163606

Method: **EPA 200.8**
Description: 200.8 MET ICPMS
Client: Montana Dept. of Environmental Quality
Date: October 13, 2011

General Information:
1 sample was analyzed for EPA 200.8. All samples were received in acceptable condition with any exceptions noted below.

Hold Time:
The samples were analyzed within the method required hold times with any exceptions noted below.

Sample Preparation:
The samples were prepared in accordance with EPA 200.8 with any exceptions noted below.

Initial Calibrations (including MS Tune as applicable):
All criteria were within method requirements with any exceptions noted below.

Continuing Calibration:
All criteria were within method requirements with any exceptions noted below.

Internal Standards:
All internal standards were within QC limits with any exceptions noted below.

Method Blank:
All analytes were below the report limit in the method blank with any exceptions noted below.

Laboratory Control Spike:
All laboratory control spike compounds were within QC limits with any exceptions noted below.

Matrix Spikes:
All percent recoveries and relative percent differences (RPDs) were within acceptance criteria with any exceptions noted below.

QC Batch: MPRP/27157

A matrix spike and matrix spike duplicate (MS/MSD) were performed on the following sample(s): 10163564001,10163589001

M1: Matrix spike recovery exceeded QC limits. Batch accepted based on laboratory control sample (LCS) recovery.

- MS (Lab ID: 1014807)
  - Chromium
  - Iron
  - Nickel
  - Silver
  - Zinc
- MSD (Lab ID: 1014808)
  - Iron
  - Silver

Duplicate Sample:
All duplicate sample results were within method acceptance criteria with any exceptions noted below.

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PROJECT NARRATIVE

Project: Black Pine Mine REV
Pace Project No.: 10163606

Method: **EPA 200.8**
Description: 200.8 MET ICPMS
Client: Montana Dept. of Environmental Quality
Date: October 13, 2011

Additional Comments:

Analyte Comments:

QC Batch: MPRP/27157

E: Analyte concentration exceeded the calibration range. The reported result is estimated.

- MS (Lab ID: 1014807)
  - Zinc

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PROJECT NARRATIVE

Project: Black Pine Mine REV
Pace Project No.: 10163606

Method: **EPA 6020**
Description: 6020 MET ICPMS
Client: Montana Dept. of Environmental Quality
Date: October 13, 2011

General Information:
8 samples were analyzed for EPA 6020. All samples were received in acceptable condition with any exceptions noted below.

Hold Time:
The samples were analyzed within the method required hold times with any exceptions noted below.

Sample Preparation:
The samples were prepared in accordance with EPA 3050 with any exceptions noted below.

Initial Calibrations (including MS Tune as applicable):
All criteria were within method requirements with any exceptions noted below.

Continuing Calibration:
All criteria were within method requirements with any exceptions noted below.

Internal Standards:
All internal standards were within QC limits with any exceptions noted below.

Method Blank:
All analytes were below the report limit in the method blank with any exceptions noted below.

QC Batch: MPRP/27163

P8: Analyte was detected in the method blank. All associated samples had concentrations of at least ten times greater than the blank or were below the reporting limit.

- BLANK (Lab ID: 1014833)
  - Lead

Laboratory Control Spike:
All laboratory control spike compounds were within QC limits with any exceptions noted below.

Matrix Spikes:
All percent recoveries and relative percent differences (RPDs) were within acceptance criteria with any exceptions noted below.

QC Batch: MPRP/27163

A matrix spike and matrix spike duplicate (MS/MSD) were performed on the following sample(s): 10163246001,10163606001

M6: Matrix spike and Matrix spike duplicate recovery not evaluated against control limits due to sample dilution.

- MS (Lab ID: 1014835)
  - Antimony
  - Barium
  - Iron
  - Manganese
  - Zinc
- MS (Lab ID: 1014837)
  - Arsenic

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PROJECT NARRATIVE

Project: Black Pine Mine REV
Pace Project No.: 10163606

Method: **EPA 6020**
Description: 6020 MET ICPMS
Client: Montana Dept. of Environmental Quality
Date: October 13, 2011

QC Batch: MPRP/27163

A matrix spike and matrix spike duplicate (MS/MSD) were performed on the following sample(s): 10163246001,10163606001

M6: Matrix spike and Matrix spike duplicate recovery not evaluated against control limits due to sample dilution.

- Barium
- Copper
- Iron
- Lead
- Manganese
- Zinc

- MSD (Lab ID: 1014836)
  - Antimony
  - Arsenic
  - Barium
  - Iron
  - Manganese
  - Zinc

Duplicate Sample:
All duplicate sample results were within method acceptance criteria with any exceptions noted below.

Additional Comments:

Analyte Comments:

QC Batch: MPRP/27163

E: Analyte concentration exceeded the calibration range. The reported result is estimated.

- MS (Lab ID: 1014835)
  - Manganese
- MSD (Lab ID: 1014836)
  - Manganese

P8: Analyte was detected in the method blank. All associated samples had concentrations of at least ten times greater than the blank or were below the reporting limit.

- BLANK (Lab ID: 1014833)
  - Lead

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PROJECT NARRATIVE

Project: Black Pine Mine REV
Pace Project No.: 10163606

Method: **EPA 7470**
Description: 7470 Mercury
Client: Montana Dept. of Environmental Quality
Date: October 13, 2011

General Information:
1 sample was analyzed for EPA 7470. All samples were received in acceptable condition with any exceptions noted below.

Hold Time:
The samples were analyzed within the method required hold times with any exceptions noted below.

Sample Preparation:
The samples were prepared in accordance with EPA 7470 with any exceptions noted below.

Initial Calibrations (including MS Tune as applicable):
All criteria were within method requirements with any exceptions noted below.

Continuing Calibration:
All criteria were within method requirements with any exceptions noted below.

Method Blank:
All analytes were below the report limit in the method blank with any exceptions noted below.

Laboratory Control Spike:
All laboratory control spike compounds were within QC limits with any exceptions noted below.

Matrix Spikes:
All percent recoveries and relative percent differences (RPDs) were within acceptance criteria with any exceptions noted below.

QC Batch: MERP/5645

A matrix spike and matrix spike duplicate (MS/MSD) were performed on the following sample(s): 10163392002,10163818001

M1: Matrix spike recovery exceeded QC limits. Batch accepted based on laboratory control sample (LCS) recovery.

- MS (Lab ID: 1016407)
  - Mercury

Duplicate Sample:
All duplicate sample results were within method acceptance criteria with any exceptions noted below.

Additional Comments:

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PROJECT NARRATIVE

Project: Black Pine Mine REV
Pace Project No.: 10163606

Method: **EPA 7471**
Description: 7471 Mercury
Client: Montana Dept. of Environmental Quality
Date: October 13, 2011

General Information:
8 samples were analyzed for EPA 7471. All samples were received in acceptable condition with any exceptions noted below.

Hold Time:
The samples were analyzed within the method required hold times with any exceptions noted below.

Sample Preparation:
The samples were prepared in accordance with EPA 7471 with any exceptions noted below.

Initial Calibrations (including MS Tune as applicable):
All criteria were within method requirements with any exceptions noted below.

Continuing Calibration:
All criteria were within method requirements with any exceptions noted below.

Method Blank:
All analytes were below the report limit in the method blank with any exceptions noted below.

Laboratory Control Spike:
All laboratory control spike compounds were within QC limits with any exceptions noted below.

Matrix Spikes:
All percent recoveries and relative percent differences (RPDs) were within acceptance criteria with any exceptions noted below.

QC Batch: MERP/5648

A matrix spike and matrix spike duplicate (MS/MSD) were performed on the following sample(s): 10163606001,10163635009

M1: Matrix spike recovery exceeded QC limits. Batch accepted based on laboratory control sample (LCS) recovery.

- MS (Lab ID: 1016597)
  - Mercury
- MSD (Lab ID: 1016598)
  - Mercury

M6: Matrix spike and Matrix spike duplicate recovery not evaluated against control limits due to sample dilution.

- MS (Lab ID: 1016599)
  - Mercury

QC Batch: MERP/5706

A matrix spike and matrix spike duplicate (MS/MSD) were performed on the following sample(s): 10163606006

M1: Matrix spike recovery exceeded QC limits. Batch accepted based on laboratory control sample (LCS) recovery.

- MS (Lab ID: 1024200)
  - Mercury

Duplicate Sample:
All duplicate sample results were within method acceptance criteria with any exceptions noted below.

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PROJECT NARRATIVE

Project: Black Pine Mine REV
Pace Project No.: 10163606

Method: **EPA 7471**
Description: 7471 Mercury
Client: Montana Dept. of Environmental Quality
Date: October 13, 2011

Additional Comments:

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PROJECT NARRATIVE

Project: Black Pine Mine REV
Pace Project No.: 10163606

Method: **Modified Sobek 3.2**
Description: Sobek Acid Base Potential
Client: Montana Dept. of Environmental Quality
Date: October 13, 2011

General Information:
4 samples were analyzed for Modified Sobek 3.2. All samples were received in acceptable condition with any exceptions noted below.

Hold Time:
The samples were analyzed within the method required hold times with any exceptions noted below.

Initial Calibrations (including MS Tune as applicable):
All criteria were within method requirements with any exceptions noted below.

Continuing Calibration:
All criteria were within method requirements with any exceptions noted below.

Internal Standards:
All internal standards were within QC limits with any exceptions noted below.

Surrogates:
All surrogates were within QC limits with any exceptions noted below.

Method Blank:
All analytes were below the report limit in the method blank with any exceptions noted below.

Laboratory Control Spike:
All laboratory control spike compounds were within QC limits with any exceptions noted below.

Matrix Spikes:
All percent recoveries and relative percent differences (RPDs) were within acceptance criteria with any exceptions noted below.

Duplicate Sample:
All duplicate sample results were within method acceptance criteria with any exceptions noted below.

Additional Comments:

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PROJECT NARRATIVE

Project: Black Pine Mine REV
Pace Project No.: 10163606

Method: **Modified Sobek 3.2**
Description: Sobek Extractable Sulfur
Client: Montana Dept. of Environmental Quality
Date: October 13, 2011

General Information:
4 samples were analyzed for Modified Sobek 3.2. All samples were received in acceptable condition with any exceptions noted below.

Hold Time:
The samples were analyzed within the method required hold times with any exceptions noted below.

Initial Calibrations (including MS Tune as applicable):
All criteria were within method requirements with any exceptions noted below.

Continuing Calibration:
All criteria were within method requirements with any exceptions noted below.

Internal Standards:
All internal standards were within QC limits with any exceptions noted below.

Surrogates:
All surrogates were within QC limits with any exceptions noted below.

Method Blank:
All analytes were below the report limit in the method blank with any exceptions noted below.

Laboratory Control Spike:
All laboratory control spike compounds were within QC limits with any exceptions noted below.

Matrix Spikes:
All percent recoveries and relative percent differences (RPDs) were within acceptance criteria with any exceptions noted below.

Duplicate Sample:
All duplicate sample results were within method acceptance criteria with any exceptions noted below.

Additional Comments:

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PROJECT NARRATIVE

Project: Black Pine Mine REV
Pace Project No.: 10163606

Method: **Modified Sobek 3.2**
Description: Sobek Calculations
Client: Montana Dept. of Environmental Quality
Date: October 13, 2011

General Information:
4 samples were analyzed for Modified Sobek 3.2. All samples were received in acceptable condition with any exceptions noted below.

Hold Time:
The samples were analyzed within the method required hold times with any exceptions noted below.

Initial Calibrations (including MS Tune as applicable):
All criteria were within method requirements with any exceptions noted below.

Continuing Calibration:
All criteria were within method requirements with any exceptions noted below.

Internal Standards:
All internal standards were within QC limits with any exceptions noted below.

Surrogates:
All surrogates were within QC limits with any exceptions noted below.

Method Blank:
All analytes were below the report limit in the method blank with any exceptions noted below.

Laboratory Control Spike:
All laboratory control spike compounds were within QC limits with any exceptions noted below.

Matrix Spikes:
All percent recoveries and relative percent differences (RPDs) were within acceptance criteria with any exceptions noted below.

Duplicate Sample:
All duplicate sample results were within method acceptance criteria with any exceptions noted below.

Additional Comments:

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PROJECT NARRATIVE

Project: Black Pine Mine REV
Pace Project No.: 10163606

Method: **Modified Sobek 3.2**
Description: Sobek SMP Buffer pH
Client: Montana Dept. of Environmental Quality
Date: October 13, 2011

General Information:
4 samples were analyzed for Modified Sobek 3.2. All samples were received in acceptable condition with any exceptions noted below.

Hold Time:
The samples were analyzed within the method required hold times with any exceptions noted below.

Initial Calibrations (including MS Tune as applicable):
All criteria were within method requirements with any exceptions noted below.

Continuing Calibration:
All criteria were within method requirements with any exceptions noted below.

Internal Standards:
All internal standards were within QC limits with any exceptions noted below.

Surrogates:
All surrogates were within QC limits with any exceptions noted below.

Method Blank:
All analytes were below the report limit in the method blank with any exceptions noted below.

Laboratory Control Spike:
All laboratory control spike compounds were within QC limits with any exceptions noted below.

Matrix Spikes:
All percent recoveries and relative percent differences (RPDs) were within acceptance criteria with any exceptions noted below.

Duplicate Sample:
All duplicate sample results were within method acceptance criteria with any exceptions noted below.

Additional Comments:

This data package has been reviewed for quality and completeness and is approved for release.

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ANALYTICAL RESULTS

Project: Black Pine Mine REV
Pace Project No.: 10163606

Sample: BP-HM-SS-03-03 **Lab ID: 10163606001** Collected: 07/13/11 10:10 Received: 07/14/11 09:25 Matrix: Solid

Results reported on a "dry-weight" basis

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
6020 MET ICPMS	Analytical Method: EPA 6020 Preparation Method: EPA 3050							
Antimony	**25.8**	mg/kg	0.48	20	07/25/11 09:38	07/31/11 17:07	7440-36-0	
Arsenic	**143**	mg/kg	0.48	20	07/25/11 09:38	07/31/11 17:07	7440-38-2	M6
Barium	**132**	mg/kg	0.29	20	07/25/11 09:38	07/31/11 17:07	7440-39-3	M6
Cadmium	**1.3**	mg/kg	0.077	20	07/25/11 09:38	07/31/11 17:07	7440-43-9	
Chromium	**8.1**	mg/kg	0.48	20	07/25/11 09:38	07/31/11 17:07	7440-47-3	
Cobalt	**7.2**	mg/kg	0.48	20	07/25/11 09:38	07/31/11 17:07	7440-48-4	
Copper	**547**	mg/kg	2.4	100	07/25/11 09:38	07/31/11 17:10	7440-50-8	M6
Iron	**15000**	mg/kg	48.2	20	07/25/11 09:38	07/31/11 17:07	7439-89-6	M6
Lead	**339**	mg/kg	0.096	20	07/25/11 09:38	07/31/11 17:07	7439-92-1	M6
Manganese	**352**	mg/kg	0.48	20	07/25/11 09:38	07/31/11 17:07	7439-96-5	M6
Nickel	**9.4**	mg/kg	0.48	20	07/25/11 09:38	07/31/11 17:07	7440-02-0	
Zinc	**85.6**	mg/kg	4.8	20	07/25/11 09:38	07/31/11 17:07	7440-66-6	M6
7471 Mercury	Analytical Method: EPA 7471 Preparation Method: EPA 7471							
Mercury	**0.86**	mg/kg	0.021	1	07/22/11 14:30	07/27/11 13:17	7439-97-6	M1
Dry Weight	Analytical Method: % Moisture							
Percent Moisture	**12.2**	%	0.10	1		07/21/11 00:00		

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ANALYTICAL RESULTS

Project: Black Pine Mine REV
Pace Project No.: 10163606

Sample: BP-HM-RS-03-01 **Lab ID: 10163606002** Collected: 07/13/11 10:15 Received: 07/14/11 09:25 Matrix: Solid

Results reported on a "dry-weight" basis

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
6020 MET ICPMS	Analytical Method: EPA 6020 Preparation Method: EPA 3050							
Antimony	**1140**	mg/kg	2.2	100	07/25/11 09:38	07/31/11 17:17	7440-36-0	
Arsenic	**894**	mg/kg	2.2	100	07/25/11 09:38	07/31/11 17:17	7440-38-2	
Barium	**364**	mg/kg	0.27	20	07/25/11 09:38	07/31/11 17:14	7440-39-3	
Cadmium	**10.8**	mg/kg	0.072	20	07/25/11 09:38	07/31/11 17:14	7440-43-9	
Chromium	**<0.45**	mg/kg	0.45	20	07/25/11 09:38	07/31/11 17:14	7440-47-3	
Cobalt	**0.77**	mg/kg	0.45	20	07/25/11 09:38	07/31/11 17:14	7440-48-4	
Copper	**925**	mg/kg	2.2	100	07/25/11 09:38	07/31/11 17:17	7440-50-8	
Iron	**24000**	mg/kg	224	100	07/25/11 09:38	07/31/11 17:17	7439-89-6	
Lead	**2800**	mg/kg	2.2	500	07/25/11 09:38	08/01/11 15:40	7439-92-1	
Manganese	**219**	mg/kg	0.45	20	07/25/11 09:38	07/31/11 17:14	7439-96-5	
Nickel	**1.5**	mg/kg	0.45	20	07/25/11 09:38	07/31/11 17:14	7440-02-0	
Zinc	**140**	mg/kg	4.5	20	07/25/11 09:38	07/31/11 17:14	7440-66-6	
7471 Mercury	Analytical Method: EPA 7471 Preparation Method: EPA 7471							
Mercury	**1.2**	mg/kg	0.20	10	07/22/11 14:30	07/27/11 13:43	7439-97-6	
Dry Weight	Analytical Method: % Moisture							
Percent Moisture	**8.4**	%	0.10	1		07/21/11 00:00		
Sobek Acid Base Potential	Analytical Method: Modified Sobek 3.2							
Neutralization Potential	**1.5**	tons/1000	0.50	1		07/29/11 00:00		
Sobek Extractable Sulfur	Analytical Method: Modified Sobek 3.2							
Sulfur, HCl Extractable	**<0.050**	% (w/w)	0.050	1		07/26/11 15:00		
Sulfur, HNO3 Extractable	**<0.050**	% (w/w)	0.050	1		07/26/11 15:00		
Sulfur, Hot Water Extractable	**0.131**	% (w/w)	0.050	1		07/26/11 15:00		
Sulfur, Residual	**<0.050**	% (w/w)	0.050	1		07/26/11 15:00		
Total Sulfur	**0.228**	% (w/w)	0.050	1		07/26/11 15:00		
Sobek Calculations	Analytical Method: Modified Sobek 3.2							
Acid/Base Potential	**1.5**	tons/1000		1		07/26/11 15:00		
Acid Potential	**<4.3**	tons/1000	4.3	1		07/26/11 15:00		
Lime Requirement	**6.3**	tons/1000	5.4	1		07/26/11 15:00		
SMP Lime Requirement	**2.4**	tons/1000	0.0	1		07/26/11 15:00		
Sobek SMP Buffer pH	Analytical Method: Modified Sobek 3.2							
SMP Buffer pH	**6.6**	Std. Units	0.10	1		07/26/11 15:00		

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ANALYTICAL RESULTS

Project: Black Pine Mine REV
Pace Project No.: 10163606

Sample: BP-HM-SS-04-10 **Lab ID: 10163606003** Collected: 07/13/11 11:30 Received: 07/14/11 09:25 Matrix: Solid

Results reported on a "dry-weight" basis

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
6020 MET ICPMS	Analytical Method: EPA 6020 Preparation Method: EPA 3050							
Antimony	**2.2**	mg/kg	0.46	20	07/25/11 09:38	07/31/11 17:21	7440-36-0	
Arsenic	**7.2**	mg/kg	0.46	20	07/25/11 09:38	07/31/11 17:21	7440-38-2	
Barium	**182**	mg/kg	0.27	20	07/25/11 09:38	07/31/11 17:21	7440-39-3	
Cadmium	**<0.073**	mg/kg	0.073	20	07/25/11 09:38	07/31/11 17:21	7440-43-9	
Chromium	**21.4**	mg/kg	0.46	20	07/25/11 09:38	07/31/11 17:21	7440-47-3	
Cobalt	**8.9**	mg/kg	0.46	20	07/25/11 09:38	07/31/11 17:21	7440-48-4	
Copper	**12.9**	mg/kg	0.46	20	07/25/11 09:38	07/31/11 17:21	7440-50-8	
Iron	**23700**	mg/kg	229	100	07/25/11 09:38	07/31/11 17:42	7439-89-6	
Lead	**13.5**	mg/kg	0.092	20	07/25/11 09:38	07/31/11 17:21	7439-92-1	
Manganese	**400**	mg/kg	2.3	100	07/25/11 09:38	07/31/11 17:42	7439-96-5	
Nickel	**18.3**	mg/kg	0.46	20	07/25/11 09:38	07/31/11 17:21	7440-02-0	
Zinc	**36.1**	mg/kg	4.6	20	07/25/11 09:38	07/31/11 17:21	7440-66-6	
7471 Mercury	Analytical Method: EPA 7471 Preparation Method: EPA 7471							
Mercury	**0.040**	mg/kg	0.019	1	07/22/11 14:30	07/27/11 13:45	7439-97-6	
Dry Weight	Analytical Method: % Moisture							
Percent Moisture	**15.4**	%	0.10	1		07/21/11 00:00		

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ANALYTICAL RESULTS

Project: Black Pine Mine REV
Pace Project No.: 10163606

Sample: BP-HM-RS-04-07 **Lab ID: 10163606004** Collected: 07/13/11 11:35 Received: 07/14/11 09:25 Matrix: Solid

Results reported on a "dry-weight" basis

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
6020 MET ICPMS	Analytical Method: EPA 6020 Preparation Method: EPA 3050							
Antimony	**39.1**	mg/kg	0.48	20	07/25/11 09:38	07/31/11 17:45	7440-36-0	
Arsenic	**43.9**	mg/kg	0.48	20	07/25/11 09:38	07/31/11 17:45	7440-38-2	
Barium	**160**	mg/kg	0.29	20	07/25/11 09:38	07/31/11 17:45	7440-39-3	
Cadmium	**0.88**	mg/kg	0.076	20	07/25/11 09:38	07/31/11 17:45	7440-43-9	
Chromium	**8.7**	mg/kg	0.48	20	07/25/11 09:38	07/31/11 17:45	7440-47-3	
Cobalt	**16.4**	mg/kg	0.48	20	07/25/11 09:38	07/31/11 17:45	7440-48-4	
Copper	**358**	mg/kg	0.48	20	07/25/11 09:38	07/31/11 17:45	7440-50-8	
Iron	**19600**	mg/kg	47.8	20	07/25/11 09:38	07/31/11 17:45	7439-89-6	
Lead	**216**	mg/kg	0.096	20	07/25/11 09:38	07/31/11 17:45	7439-92-1	
Manganese	**497**	mg/kg	2.4	100	07/25/11 09:38	07/31/11 17:49	7439-96-5	
Nickel	**14.1**	mg/kg	0.48	20	07/25/11 09:38	07/31/11 17:45	7440-02-0	
Zinc	**50.6**	mg/kg	4.8	20	07/25/11 09:38	07/31/11 17:45	7440-66-6	
7471 Mercury	Analytical Method: EPA 7471 Preparation Method: EPA 7471							
Mercury	**0.34**	mg/kg	0.018	1	07/22/11 14:30	07/27/11 13:47	7439-97-6	
Dry Weight	Analytical Method: % Moisture							
Percent Moisture	**15.0**	%	0.10	1		07/21/11 00:00		
Sobek Acid Base Potential	Analytical Method: Modified Sobek 3.2							
Neutralization Potential	**3.2**	tons/1000	0.50	1		07/29/11 00:00		
Sobek Extractable Sulfur	Analytical Method: Modified Sobek 3.2							
Sulfur, HCl Extractable	**<0.050**	% (w/w)	0.050	1		07/26/11 15:00		
Sulfur, HNO3 Extractable	**<0.050**	% (w/w)	0.050	1		07/26/11 15:00		
Sulfur, Hot Water Extractable	**<0.050**	% (w/w)	0.050	1		07/26/11 15:00		
Sulfur, Residual	**<0.050**	% (w/w)	0.050	1		07/26/11 15:00		
Total Sulfur	**<0.050**	% (w/w)	0.050	1		07/26/11 15:00		
Sobek Calculations	Analytical Method: Modified Sobek 3.2							
Acid/Base Potential	**3.2**	tons/1000		1		07/26/11 15:00		
Acid Potential	**<4.3**	tons/1000	4.3	1		07/26/11 15:00		
Lime Requirement	**<5.4**	tons/1000	5.4	1		07/26/11 15:00		
SMP Lime Requirement	**2.4**	tons/1000	0.0	1		07/26/11 15:00		
Sobek SMP Buffer pH	Analytical Method: Modified Sobek 3.2							
SMP Buffer pH	**6.6**	Std. Units	0.10	1		07/26/11 15:00		

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ANALYTICAL RESULTS

Project: Black Pine Mine REV
Pace Project No.: 10163606

Sample: BP-QC-WT-T1 **Lab ID: 10163606005** Collected: 07/13/11 12:20 Received: 07/14/11 09:25 Matrix: Water

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
200.8 MET ICPMS	Analytical Method: EPA 200.8 Preparation Method: EPA 200.8							
Antimony	**<0.50**	ug/L	0.50	1	07/21/11 16:00	07/28/11 06:30	7440-36-0	
Arsenic	**<0.50**	ug/L	0.50	1	07/21/11 16:00	07/28/11 06:30	7440-38-2	
Barium	**<0.30**	ug/L	0.30	1	07/21/11 16:00	07/28/11 06:30	7440-39-3	
Cadmium	**<0.080**	ug/L	0.080	1	07/21/11 16:00	07/28/11 06:30	7440-43-9	
Chromium	**<0.50**	ug/L	0.50	1	07/21/11 16:00	07/28/11 06:30	7440-47-3	
Copper	**<0.50**	ug/L	0.50	1	07/21/11 16:00	07/28/11 06:30	7440-50-8	
Iron	**<50.0**	ug/L	50.0	1	07/21/11 16:00	07/28/11 06:30	7439-89-6	
Lead	**0.47**	ug/L	0.10	1	07/21/11 16:00	07/28/11 06:30	7439-92-1	
Manganese	**<0.50**	ug/L	0.50	1	07/21/11 16:00	07/28/11 06:30	7439-96-5	
Nickel	**<0.50**	ug/L	0.50	1	07/21/11 16:00	07/28/11 06:30	7440-02-0	
Silver	**<0.50**	ug/L	0.50	1	07/21/11 16:00	07/28/11 06:30	7440-22-4	
Zinc	**<5.0**	ug/L	5.0	1	07/21/11 16:00	07/28/11 06:30	7440-66-6	
7470 Mercury	Analytical Method: EPA 7470 Preparation Method: EPA 7470							
Mercury	**<0.20**	ug/L	0.20	1	07/20/11 13:24	07/21/11 13:33	7439-97-6	

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ANALYTICAL RESULTS

Project: Black Pine Mine REV
Pace Project No.: 10163606

Sample: BP-HM-RS-01-16.5 **Lab ID: 10163606006** Collected: 07/13/11 12:45 Received: 07/14/11 09:25 Matrix: Solid

Results reported on a "dry-weight" basis

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
6020 MET ICPMS	Analytical Method: EPA 6020 Preparation Method: EPA 3050							
Antimony	**1.1**	mg/kg	0.45	20	07/25/11 09:38	07/31/11 17:52	7440-36-0	
Arsenic	**6.1**	mg/kg	0.45	20	07/25/11 09:38	07/31/11 17:52	7440-38-2	
Barium	**127**	mg/kg	0.27	20	07/25/11 09:38	07/31/11 17:52	7440-39-3	
Cadmium	**<0.073**	mg/kg	0.073	20	07/25/11 09:38	07/31/11 17:52	7440-43-9	
Chromium	**13.1**	mg/kg	0.45	20	07/25/11 09:38	07/31/11 17:52	7440-47-3	
Cobalt	**9.5**	mg/kg	0.45	20	07/25/11 09:38	07/31/11 17:52	7440-48-4	
Copper	**12.1**	mg/kg	0.45	20	07/25/11 09:38	07/31/11 17:52	7440-50-8	
Iron	**21100**	mg/kg	227	100	07/25/11 09:38	07/31/11 17:56	7439-89-6	
Lead	**9.6**	mg/kg	0.091	20	07/25/11 09:38	07/31/11 17:52	7439-92-1	
Manganese	**211**	mg/kg	0.45	20	07/25/11 09:38	07/31/11 17:52	7439-96-5	
Nickel	**15.3**	mg/kg	0.45	20	07/25/11 09:38	07/31/11 17:52	7440-02-0	
Zinc	**31.4**	mg/kg	4.5	20	07/25/11 09:38	07/31/11 17:52	7440-66-6	
7471 Mercury	Analytical Method: EPA 7471 Preparation Method: EPA 7471							
Mercury	**0.046**	mg/kg	0.023	1	08/01/11 10:30	08/01/11 13:03	7439-97-6	M1
Dry Weight	Analytical Method: % Moisture							
Percent Moisture	**19.6**	%	0.10	1		07/21/11 00:00		

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ANALYTICAL RESULTS

Project: Black Pine Mine REV
Pace Project No.: 10163606

Sample: BP-HM-RS-01-08 **Lab ID: 10163606007** Collected: 07/13/11 13:15 Received: 07/14/11 09:25 Matrix: Solid

Results reported on a "dry-weight" basis

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
6020 MET ICPMS	Analytical Method: EPA 6020 Preparation Method: EPA 3050							
Antimony	**1.2**	mg/kg	0.48	20	07/25/11 09:38	07/31/11 17:59	7440-36-0	
Arsenic	**7.9**	mg/kg	0.48	20	07/25/11 09:38	07/31/11 17:59	7440-38-2	
Barium	**126**	mg/kg	0.29	20	07/25/11 09:38	07/31/11 17:59	7440-39-3	
Cadmium	**0.36**	mg/kg	0.076	20	07/25/11 09:38	07/31/11 17:59	7440-43-9	
Chromium	**9.9**	mg/kg	0.48	20	07/25/11 09:38	07/31/11 17:59	7440-47-3	
Cobalt	**7.0**	mg/kg	0.48	20	07/25/11 09:38	07/31/11 17:59	7440-48-4	
Copper	**71.5**	mg/kg	0.48	20	07/25/11 09:38	07/31/11 17:59	7440-50-8	
Iron	**19800**	mg/kg	47.7	20	07/25/11 09:38	07/31/11 17:59	7439-89-6	
Lead	**8.6**	mg/kg	0.095	20	07/25/11 09:38	07/31/11 17:59	7439-92-1	
Manganese	**119**	mg/kg	0.48	20	07/25/11 09:38	07/31/11 17:59	7439-96-5	
Nickel	**13.6**	mg/kg	0.48	20	07/25/11 09:38	07/31/11 17:59	7440-02-0	
Zinc	**47.9**	mg/kg	4.8	20	07/25/11 09:38	07/31/11 17:59	7440-66-6	
7471 Mercury	Analytical Method: EPA 7471 Preparation Method: EPA 7471							
Mercury	**0.077**	mg/kg	0.021	1	07/22/11 14:30	07/27/11 13:54	7439-97-6	
Dry Weight	Analytical Method: % Moisture							
Percent Moisture	**14.1**	%	0.10	1		07/21/11 00:00		
Sobek Acid Base Potential	Analytical Method: Modified Sobek 3.2							
Neutralization Potential	**0.74**	tons/1000	0.50	1		07/29/11 00:00		
Sobek Extractable Sulfur	Analytical Method: Modified Sobek 3.2							
Sulfur, HCl Extractable	**<0.050**	% (w/w)	0.050	1		07/26/11 15:00		
Sulfur, HNO3 Extractable	**<0.050**	% (w/w)	0.050	1		07/26/11 15:00		
Sulfur, Hot Water Extractable	**<0.050**	% (w/w)	0.050	1		07/26/11 15:00		
Sulfur, Residual	**<0.050**	% (w/w)	0.050	1		07/26/11 15:00		
Total Sulfur	**<0.050**	% (w/w)	0.050	1		07/26/11 15:00		
Sobek Calculations	Analytical Method: Modified Sobek 3.2							
Acid/Base Potential	**0.74**	tons/1000		1		07/26/11 15:00		
Acid Potential	**<4.3**	tons/1000	4.3	1		07/26/11 15:00		
Lime Requirement	**<5.4**	tons/1000	5.4	1		07/26/11 15:00		
SMP Lime Requirement	**1.8**	tons/1000	0.0	1		07/26/11 15:00		
Sobek SMP Buffer pH	Analytical Method: Modified Sobek 3.2							
SMP Buffer pH	**6.7**	Std. Units	0.10	1		07/26/11 15:00		

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ANALYTICAL RESULTS

Project: Black Pine Mine REV
Pace Project No.: 10163606

Sample: BP-HM-RS-02-01 **Lab ID: 10163606008** Collected: 07/13/11 13:50 Received: 07/14/11 09:25 Matrix: Solid

Results reported on a "dry-weight" basis

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
6020 MET ICPMS	Analytical Method: EPA 6020 Preparation Method: EPA 3050							
Antimony	**421**	mg/kg	0.56	20	07/25/11 09:38	07/31/11 18:06	7440-36-0	
Arsenic	**376**	mg/kg	0.56	20	07/25/11 09:38	07/31/11 18:06	7440-38-2	
Barium	**149**	mg/kg	0.33	20	07/25/11 09:38	07/31/11 18:06	7440-39-3	
Cadmium	**7.1**	mg/kg	0.089	20	07/25/11 09:38	07/31/11 18:06	7440-43-9	
Chromium	**2.7**	mg/kg	0.56	20	07/25/11 09:38	07/31/11 18:06	7440-47-3	
Cobalt	**4.7**	mg/kg	0.56	20	07/25/11 09:38	07/31/11 18:06	7440-48-4	
Copper	**1010**	mg/kg	2.8	100	07/25/11 09:38	07/31/11 18:10	7440-50-8	
Iron	**15900**	mg/kg	55.7	20	07/25/11 09:38	07/31/11 18:06	7439-89-6	
Lead	**1820**	mg/kg	0.56	100	07/25/11 09:38	07/31/11 18:10	7439-92-1	
Manganese	**740**	mg/kg	2.8	100	07/25/11 09:38	07/31/11 18:10	7439-96-5	
Nickel	**6.7**	mg/kg	0.56	20	07/25/11 09:38	07/31/11 18:06	7440-02-0	
Zinc	**71.2**	mg/kg	5.6	20	07/25/11 09:38	07/31/11 18:06	7440-66-6	
7471 Mercury	Analytical Method: EPA 7471 Preparation Method: EPA 7471							
Mercury	**<0.021**	mg/kg	0.021	1	07/22/11 14:30	07/27/11 13:56	7439-97-6	
Dry Weight	Analytical Method: % Moisture							
Percent Moisture	**15.3**	%	0.10	1		07/21/11 00:00		
Sobek Acid Base Potential	Analytical Method: Modified Sobek 3.2							
Neutralization Potential	**1.7**	tons/1000	0.50	1		07/29/11 00:00		
Sobek Extractable Sulfur	Analytical Method: Modified Sobek 3.2							
Sulfur, HCl Extractable	**<0.050**	% (w/w)	0.050	1		07/26/11 15:00		
Sulfur, HNO3 Extractable	**<0.050**	% (w/w)	0.050	1		07/26/11 15:00		
Sulfur, Hot Water Extractable	**<0.050**	% (w/w)	0.050	1		07/26/11 15:00		
Sulfur, Residual	**<0.050**	% (w/w)	0.050	1		07/26/11 15:00		
Total Sulfur	**0.0529**	% (w/w)	0.050	1		07/26/11 15:00		
Sobek Calculations	Analytical Method: Modified Sobek 3.2							
Acid/Base Potential	**1.7**	tons/1000		1		07/26/11 15:00		
Acid Potential	**<4.3**	tons/1000	4.3	1		07/26/11 15:00		
Lime Requirement	**7.3**	tons/1000	5.4	1		07/26/11 15:00		
SMP Lime Requirement	**5.3**	tons/1000	0.0	1		07/26/11 15:00		
Sobek SMP Buffer pH	Analytical Method: Modified Sobek 3.2							
SMP Buffer pH	**6.2**	Std. Units	0.10	1		07/26/11 15:00		

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ANALYTICAL RESULTS

Project: Black Pine Mine REV
Pace Project No.: 10163606

Sample: BP-HM-RS-02-03 **Lab ID: 10163606009** Collected: 07/13/11 13:55 Received: 07/14/11 09:25 Matrix: Solid

Results reported on a "dry-weight" basis

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
6020 MET ICPMS	Analytical Method: EPA 6020 Preparation Method: EPA 3050							
Antimony	**2.7**	mg/kg	0.42	20	07/25/11 09:38	07/31/11 18:28	7440-36-0	
Arsenic	**11.0**	mg/kg	0.42	20	07/25/11 09:38	07/31/11 18:28	7440-38-2	
Barium	**147**	mg/kg	0.25	20	07/25/11 09:38	07/31/11 18:28	7440-39-3	
Cadmium	**0.23**	mg/kg	0.068	20	07/25/11 09:38	07/31/11 18:28	7440-43-9	
Chromium	**8.5**	mg/kg	0.42	20	07/25/11 09:38	07/31/11 18:28	7440-47-3	
Cobalt	**9.6**	mg/kg	0.42	20	07/25/11 09:38	07/31/11 18:28	7440-48-4	
Copper	**23.2**	mg/kg	0.42	20	07/25/11 09:38	07/31/11 18:28	7440-50-8	
Iron	**16500**	mg/kg	42.2	20	07/25/11 09:38	07/31/11 18:28	7439-89-6	
Lead	**34.8**	mg/kg	0.084	20	07/25/11 09:38	07/31/11 18:28	7439-92-1	
Manganese	**620**	mg/kg	2.1	100	07/25/11 09:38	07/31/11 18:31	7439-96-5	
Nickel	**11.2**	mg/kg	0.42	20	07/25/11 09:38	07/31/11 18:28	7440-02-0	
Zinc	**46.6**	mg/kg	4.2	20	07/25/11 09:38	07/31/11 18:28	7440-66-6	
7471 Mercury	Analytical Method: EPA 7471 Preparation Method: EPA 7471							
Mercury	**3.5**	mg/kg	0.23	10	07/22/11 14:30	07/27/11 14:03	7439-97-6	
Dry Weight	Analytical Method: % Moisture							
Percent Moisture	**14.2**	%	0.10	1		07/21/11 00:00		

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QUALITY CONTROL DATA

Project: Black Pine Mine REV
Pace Project No.: 10163606

QC Batch: MPRP/27157
QC Batch Method: EPA 200.8
Analysis Method: EPA 200.8
Analysis Description: 200.8 MET
Associated Lab Samples: 10163606005

METHOD BLANK: 1014805 Matrix: Water
Associated Lab Samples: 10163606005

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Antimony	ug/L	<0.50	0.50	07/28/11 04:19	
Arsenic	ug/L	<0.50	0.50	07/28/11 04:19	
Barium	ug/L	<0.30	0.30	07/28/11 04:19	
Cadmium	ug/L	<0.080	0.080	07/28/11 04:19	
Chromium	ug/L	<0.50	0.50	07/28/11 04:19	
Copper	ug/L	<0.50	0.50	07/28/11 04:19	
Iron	ug/L	<50.0	50.0	07/28/11 04:19	
Lead	ug/L	<0.10	0.10	07/28/11 14:02	
Manganese	ug/L	<0.50	0.50	07/28/11 04:19	
Nickel	ug/L	<0.50	0.50	07/28/11 04:19	
Silver	ug/L	<0.50	0.50	07/28/11 04:19	
Zinc	ug/L	<5.0	5.0	07/28/11 04:19	

LABORATORY CONTROL SAMPLE: 1014806

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Antimony	ug/L	80	84.8	106	85-115	
Arsenic	ug/L	80	85.9	107	85-115	
Barium	ug/L	80	81.2	102	85-115	
Cadmium	ug/L	80	84.5	106	85-115	
Chromium	ug/L	80	80.0	100	85-115	
Copper	ug/L	80	80.5	101	85-115	
Iron	ug/L	1000	1050	105	85-115	
Lead	ug/L	80	91.3	114	85-115	
Manganese	ug/L	80	80.6	101	85-115	
Nickel	ug/L	80	80.0	100	85-115	
Silver	ug/L	80	70.9	89	85-115	
Zinc	ug/L	80	86.1	108	85-115	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 1014807 1014808

Parameter	Units	10163564001 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Antimony	ug/L	5.3	80	80	88.8	80.0	104	93	70-130	11	20	
Arsenic	ug/L	5.5	80	80	89.2	88.0	105	103	70-130	1	20	
Barium	ug/L	310	80	80	403	378	117	86	70-130	6	20	
Cadmium	ug/L	3.3	80	80	87.9	83.4	106	100	70-130	5	20	
Chromium	ug/L	130	80	80	235	222	132	116	70-130	6	20	M1
Copper	ug/L	91.0	80	80	181	175	112	105	70-130	4	20	
Iron	ug/L	26000	1000	1000	27700	26600	174	67	70-130	4	20	M1

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QUALITY CONTROL DATA

Project: Black Pine Mine REV
Pace Project No.: 10163606

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 1014807 1014808

Parameter	Units	10163564001 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Lead	ug/L	77.5	80	80	180	142	128	80	70-130	24	20	D6
Manganese	ug/L	389	80	80	480	447	113	72	70-130	7	20	
Nickel	ug/L	987	80	80	1140	1050	198	82	70-130	8	20	M1
Silver	ug/L	ND	80	80	44.1	40.2	55	50	70-130	9	20	M1

MATRIX SPIKE SAMPLE: 1014809

Parameter	Units	10163589001 Result	Spike Conc.	MS Result	MS % Rec	% Rec Limits	Qualifiers
Antimony	ug/L	<0.50	80	87.7	109	70-130	
Arsenic	ug/L	1.4	80	89.9	111	70-130	
Barium	ug/L	21.0	80	110	111	70-130	
Cadmium	ug/L	<0.080	80	82.8	104	70-130	
Chromium	ug/L	<0.50	80	85.6	107	70-130	
Copper	ug/L	0.013 mg/L	80	102	111	70-130	
Iron	ug/L	<50.0	1000	1070	107	70-130	
Lead	ug/L	0.0012 mg/L	80	104	128	70-130	
Manganese	ug/L	<0.50	80	87.1	109	70-130	
Nickel	ug/L	<0.50	80	88.6	110	70-130	
Silver	ug/L	<0.50	80	73.2	91	70-130	
Zinc	ug/L	<5.0	80	87.8	104	70-130	

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QUALITY CONTROL DATA

Project: Black Pine Mine REV
Pace Project No.: 10163606

QC Batch: MPRP/27163 Analysis Method: EPA 6020
QC Batch Method: EPA 3050 Analysis Description: 6020 MET
Associated Lab Samples: 10163606001, 10163606002, 10163606003, 10163606004, 10163606006, 10163606007, 10163606008, 10163606009

METHOD BLANK: 1014833 Matrix: Solid
Associated Lab Samples: 10163606001, 10163606002, 10163606003, 10163606004, 10163606006, 10163606007, 10163606008, 10163606009

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Antimony	mg/kg	<0.49	0.49	07/31/11 15:14	
Arsenic	mg/kg	<0.49	0.49	07/31/11 15:14	
Barium	mg/kg	<0.29	0.29	07/31/11 15:14	
Cadmium	mg/kg	<0.078	0.078	07/31/11 15:14	
Chromium	mg/kg	<0.49	0.49	07/31/11 15:14	
Cobalt	mg/kg	<0.49	0.49	07/31/11 15:14	
Copper	mg/kg	<0.49	0.49	07/31/11 15:14	
Iron	mg/kg	<48.5	48.5	07/31/11 15:14	
Lead	mg/kg	0.34	0.097	07/31/11 15:14	P8
Manganese	mg/kg	<0.49	0.49	07/31/11 15:14	
Nickel	mg/kg	<0.49	0.49	07/31/11 15:14	
Zinc	mg/kg	<4.9	4.9	07/31/11 15:14	

LABORATORY CONTROL SAMPLE: 1014834

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Antimony	mg/kg	16	17.7	111	75-125	
Arsenic	mg/kg	16	17.0	106	75-125	
Barium	mg/kg	16	18.0	113	75-125	
Cadmium	mg/kg	16	17.5	109	75-125	
Chromium	mg/kg	16	17.8	112	75-125	
Cobalt	mg/kg	16	17.9	112	75-125	
Copper	mg/kg	16	17.9	112	75-125	
Iron	mg/kg	200	227	114	75-125	
Lead	mg/kg	16	17.8	111	75-125	
Manganese	mg/kg	16	18.2	114	75-125	
Nickel	mg/kg	16	18.3	114	75-125	
Zinc	mg/kg	16	17.5	109	75-125	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 1014835 1014836

Parameter	Units	10163246001 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Antimony	mg/kg	0.60	19.6	19.5	9.8	8.9	47	43	75-125	10	20	M6
Arsenic	mg/kg	7.2	19.6	19.5	27.9	32.2	105	129	75-125	15	20	M6
Barium	mg/kg	248	19.6	19.5	334	511	437	1350	75-125	42	20	D6,M6
Cadmium	mg/kg	0.31	19.6	19.5	18.5	18.5	93	93	75-125	.3	20	
Chromium	mg/kg	4.4	19.6	19.5	24.9	25.9	104	111	75-125	4	20	

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QUALITY CONTROL DATA

Project: Black Pine Mine REV
Pace Project No.: 10163606

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 1014835 1014836

Parameter	Units	10163246001 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Cobalt	mg/kg	3.3	19.6	19.5	21.9	22.7	94	99	75-125	4	20	
Copper	mg/kg	5.7	19.6	19.5	25.0	28.6	98	118	75-125	14	20	
Iron	mg/kg	6090	245	243	8220	10800	870	1930	75-125	27	20	D6,M6
Lead	mg/kg	5.4	19.6	19.5	25.3	28.9	101	120	75-125	13	20	
Manganese	mg/kg	782	19.6	19.5	1490	2350	3610	8050	75-125	45	20	D6,E, M6
Nickel	mg/kg	8.5	19.6	19.5	27.8	29.9	99	110	75-125	7	20	
Zinc	mg/kg	42.7	19.6	19.5	75.3	102	166	305	75-125	30	20	D6,M6

MATRIX SPIKE SAMPLE: 1014837

Parameter	Units	10163606001 Result	Spike Conc.	MS Result	MS % Rec	% Rec Limits	Qualifiers
Antimony	mg/kg	25.8	16.3	38.9	80	75-125	
Arsenic	mg/kg	143	16.3	50.6	-569	75-125	M6
Barium	mg/kg	132	16.3	164	198	75-125	M6
Cadmium	mg/kg	1.3	16.3	17.4	99	75-125	
Chromium	mg/kg	8.1	16.3	26.2	111	75-125	
Cobalt	mg/kg	7.2	16.3	21.0	85	75-125	
Copper	mg/kg	547	16.3	697	924	75-125	M6
Iron	mg/kg	15000	204	15500	257	75-125	M6
Lead	mg/kg	339	16.3	169	-1040	75-125	M6
Manganese	mg/kg	352	16.3	300	-318	75-125	M6
Nickel	mg/kg	9.4	16.3	26.7	106	75-125	
Zinc	mg/kg	85.6	16.3	107	132	75-125	M6

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QUALITY CONTROL DATA

Project: Black Pine Mine REV
Pace Project No.: 10163606

QC Batch: MERP/5645
QC Batch Method: EPA 7470
Analysis Method: EPA 7470
Analysis Description: 7470 Mercury
Associated Lab Samples: 10163606005

METHOD BLANK: 1016403 Matrix: Water
Associated Lab Samples: 10163606005

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Mercury	ug/L	<0.20	0.20	07/21/11 13:06	

LABORATORY CONTROL SAMPLE: 1016404

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Mercury	ug/L	5	5.4	108	80-120	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 1016405 1016406

Parameter	Units	10163392002 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Mercury	ug/L	ND	5	5	4.7	4.9	93	99	80-120	6	20	

MATRIX SPIKE SAMPLE: 1016407

Parameter	Units	10163818001 Result	Spike Conc.	MS Result	MS % Rec	% Rec Limits	Qualifiers
Mercury	ug/L	<0.037	5	3.3	66	80-120	M1

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QUALITY CONTROL DATA

Project: Black Pine Mine REV
Pace Project No.: 10163606

QC Batch: MERP/5648 Analysis Method: EPA 7471
QC Batch Method: EPA 7471 Analysis Description: 7471 Mercury
Associated Lab Samples: 10163606001, 10163606002, 10163606003, 10163606004, 10163606007, 10163606008, 10163606009

METHOD BLANK: 1016595 Matrix: Solid
Associated Lab Samples: 10163606001, 10163606002, 10163606003, 10163606004, 10163606007, 10163606008, 10163606009

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Mercury	mg/kg	<0.019	0.019	07/27/11 13:13	

LABORATORY CONTROL SAMPLE: 1016596

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Mercury	mg/kg	.47	0.51	108	80-120	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 1016597 1016598

Parameter	Units	10163606001 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Mercury	mg/kg	0.86	.54	.57	0.77	1.3	-16	75	80-120	50	20	D6,M1

MATRIX SPIKE SAMPLE: 1016599

Parameter	Units	10163635009 Result	Spike Conc.	MS Result	MS % Rec	% Rec Limits	Qualifiers
Mercury	mg/kg	13.0	.52	13.3	53	80-120	M6

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QUALITY CONTROL DATA

Project: Black Pine Mine REV
Pace Project No.: 10163606

QC Batch: MERP/5706
QC Batch Method: EPA 7471
Analysis Method: EPA 7471
Analysis Description: 7471 Mercury
Associated Lab Samples: 10163606006

METHOD BLANK: 1024198 Matrix: Solid
Associated Lab Samples: 10163606006

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Mercury	mg/kg	<0.020	0.020	08/01/11 12:59	

LABORATORY CONTROL SAMPLE: 1024199

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Mercury	mg/kg	.5	0.50	100	80-120	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 1024200 1024201

Parameter	Units	10163606006 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Mercury	mg/kg	0.046	.54	.56	0.69	0.72	121	119	80-120	4	20	M1

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QUALITY CONTROL DATA

Project: Black Pine Mine REV
Pace Project No.: 10163606

QC Batch: MPRP/27256 Analysis Method: % Moisture
QC Batch Method: % Moisture Analysis Description: Dry Weight/Percent Moisture
Associated Lab Samples: 10163606001, 10163606002, 10163606003

SAMPLE DUPLICATE: 1017553

Parameter	Units	10163864002 Result	Dup Result	RPD	Max RPD	Qualifiers
Percent Moisture	%	23.9	22.3	7	30	

SAMPLE DUPLICATE: 1017554

Parameter	Units	10163606003 Result	Dup Result	RPD	Max RPD	Qualifiers
Percent Moisture	%	15.4	16.0	4	30	

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QUALITY CONTROL DATA

Project: Black Pine Mine REV
Pace Project No.: 10163606

QC Batch: MPRP/27258 Analysis Method: % Moisture
QC Batch Method: % Moisture Analysis Description: Dry Weight/Percent Moisture
Associated Lab Samples: 10163606004, 10163606006, 10163606007, 10163606008, 10163606009

SAMPLE DUPLICATE: 1017623

Parameter	Units	10163606004 Result	Dup Result	RPD	Max RPD	Qualifiers
Percent Moisture	%	15.0	14.2	5	30	

SAMPLE DUPLICATE: 1017624

Parameter	Units	10163635009 Result	Dup Result	RPD	Max RPD	Qualifiers
Percent Moisture	%	6.9	7.6	9	30	

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QUALITY CONTROL DATA

Project: Black Pine Mine REV
Pace Project No.: 10163606

QC Batch: MT/6480 Analysis Method: Modified Sobek 3.2
QC Batch Method: Modified Sobek 3.2 Analysis Description: Sobek Acid Base Potential
Associated Lab Samples: 10163606002, 10163606004, 10163606007, 10163606008

METHOD BLANK: 1019986 Matrix: Solid
Associated Lab Samples: 10163606002, 10163606004, 10163606007, 10163606008

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Neutralization Potential	tons/1000	<0.5	0.50	07/29/11 00:00	

SAMPLE DUPLICATE: 1019631

Parameter	Units	10163606002 Result	Dup Result	RPD	Max RPD	Qualifiers
Neutralization Potential	tons/1000	1.5	1.7			

SAMPLE DUPLICATE: 1019632

Parameter	Units	10163246007 Result	Dup Result	RPD	Max RPD	Qualifiers
Neutralization Potential	tons/1000	4.0	5.7			

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QUALITY CONTROL DATA

Project: Black Pine Mine REV
Pace Project No.: 10163606

QC Batch: MT/6452 Analysis Method: Modified Sobek 3.2
QC Batch Method: Modified Sobek 3.2 Analysis Description: Sobek Extractable Sulfur
Associated Lab Samples: 10163606002, 10163606004, 10163606007, 10163606008

METHOD BLANK: 1017262 Matrix: Solid
Associated Lab Samples: 10163606002, 10163606004, 10163606007, 10163606008

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Total Sulfur	% (w/w)	<0.050	0.050	07/29/11 16:11	

SAMPLE DUPLICATE: 1017264

Parameter	Units	10163606002 Result	Dup Result	RPD	Max RPD	Qualifiers
Total Sulfur	% (w/w)	0.228	0.211	8		

SAMPLE DUPLICATE: 1017265

Parameter	Units	10163246007 Result	Dup Result	RPD	Max RPD	Qualifiers
Total Sulfur	% (w/w)	<0.050	<0.050			

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QUALITY CONTROL DATA

Project: Black Pine Mine REV
Pace Project No.: 10163606

QC Batch: MT/6481 Analysis Method: Modified Sobek 3.2
QC Batch Method: Modified Sobek 3.2 Analysis Description: Sobek SMP Buffer pH
Associated Lab Samples: 10163606002, 10163606004, 10163606007, 10163606008

LABORATORY CONTROL SAMPLE: 1019634

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
SMP Buffer pH	Std. Units		7.0			

SAMPLE DUPLICATE: 1019635

Parameter	Units	10163606002 Result	Dup Result	RPD	Max RPD	Qualifiers
SMP Buffer pH	Std. Units	6.6	6.6	0	20	

SAMPLE DUPLICATE: 1019636

Parameter	Units	10163246007 Result	Dup Result	RPD	Max RPD	Qualifiers
SMP Buffer pH	Std. Units	6.8	6.8	.7	20	

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QUALIFIERS

Project: Black Pine Mine REV
Pace Project No.: 10163606

DEFINITIONS

DF - Dilution Factor, if reported, represents the factor applied to the reported data due to changes in sample preparation, dilution of the sample aliquot, or moisture content.

ND - Not Detected at or above adjusted reporting limit.

J - Estimated concentration above the adjusted method detection limit and below the adjusted reporting limit.

MDL - Adjusted Method Detection Limit.

S - Surrogate

1,2-Diphenylhydrazine (8270 listed analyte) decomposes to Azobenzene.

Consistent with EPA guidelines, unrounded data are displayed and have been used to calculate % recovery and RPD values.

LCS(D) - Laboratory Control Sample (Duplicate)

MS(D) - Matrix Spike (Duplicate)

DUP - Sample Duplicate

RPD - Relative Percent Difference

NC - Not Calculable.

SG - Silica Gel - Clean-Up

U - Indicates the compound was analyzed for, but not detected.

N-Nitrosodiphenylamine decomposes and cannot be separated from Diphenylamine using Method 8270. The result reported for each analyte is a combined concentration.

LABORATORIES

PASI-M	Pace Analytical Services - Minneapolis
PASI-MT	Pace Analytical Services - Montana

ANALYTE QUALIFIERS

D6	The relative percent difference (RPD) between the sample and sample duplicate exceeded laboratory control limits.
E	Analyte concentration exceeded the calibration range. The reported result is estimated.
M1	Matrix spike recovery exceeded QC limits. Batch accepted based on laboratory control sample (LCS) recovery.
M6	Matrix spike and Matrix spike duplicate recovery not evaluated against control limits due to sample dilution.
P8	Analyte was detected in the method blank. All associated samples had concentrations of at least ten times greater than the blank or were below the reporting limit.

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QUALITY CONTROL DATA CROSS REFERENCE TABLE

Project: Black Pine Mine REV
Pace Project No.: 10163606

Lab ID	Sample ID	QC Batch Method	QC Batch	Analytical Method	Analytical Batch
10163606005	**BP-QC-WT-T1**	EPA 200.8	MPRP/27157	EPA 200.8	ICPM/11106
10163606001	**BP-HM-SS-03-03**	EPA 3050	MPRP/27163	EPA 6020	ICPM/11135
10163606002	**BP-HM-RS-03-01**	EPA 3050	MPRP/27163	EPA 6020	ICPM/11135
10163606003	**BP-HM-SS-04-10**	EPA 3050	MPRP/27163	EPA 6020	ICPM/11135
10163606004	**BP-HM-RS-04-07**	EPA 3050	MPRP/27163	EPA 6020	ICPM/11135
10163606006	**BP-HM-RS-01-16.5**	EPA 3050	MPRP/27163	EPA 6020	ICPM/11135
10163606007	**BP-HM-RS-01-08**	EPA 3050	MPRP/27163	EPA 6020	ICPM/11135
10163606008	**BP-HM-RS-02-01**	EPA 3050	MPRP/27163	EPA 6020	ICPM/11135
10163606009	**BP-HM-RS-02-03**	EPA 3050	MPRP/27163	EPA 6020	ICPM/11135
10163606005	**BP-QC-WT-T1**	EPA 7470	MERP/5645	EPA 7470	MERC/6457
10163606001	**BP-HM-SS-03-03**	EPA 7471	MERP/5648	EPA 7471	MERC/6470
10163606002	**BP-HM-RS-03-01**	EPA 7471	MERP/5648	EPA 7471	MERC/6470
10163606003	**BP-HM-SS-04-10**	EPA 7471	MERP/5648	EPA 7471	MERC/6470
10163606004	**BP-HM-RS-04-07**	EPA 7471	MERP/5648	EPA 7471	MERC/6470
10163606006	**BP-HM-RS-01-16.5**	EPA 7471	MERP/5706	EPA 7471	MERC/6506
10163606007	**BP-HM-RS-01-08**	EPA 7471	MERP/5648	EPA 7471	MERC/6470
10163606008	**BP-HM-RS-02-01**	EPA 7471	MERP/5648	EPA 7471	MERC/6470
10163606009	**BP-HM-RS-02-03**	EPA 7471	MERP/5648	EPA 7471	MERC/6470
10163606001	**BP-HM-SS-03-03**	% Moisture	MPRP/27256		
10163606002	**BP-HM-RS-03-01**	% Moisture	MPRP/27256		
10163606003	**BP-HM-SS-04-10**	% Moisture	MPRP/27256		
10163606004	**BP-HM-RS-04-07**	% Moisture	MPRP/27258		
10163606006	**BP-HM-RS-01-16.5**	% Moisture	MPRP/27258		
10163606007	**BP-HM-RS-01-08**	% Moisture	MPRP/27258		
10163606008	**BP-HM-RS-02-01**	% Moisture	MPRP/27258		
10163606009	**BP-HM-RS-02-03**	% Moisture	MPRP/27258		
10163606002	**BP-HM-RS-03-01**	Modified Sobek 3.2	MT/6480		
10163606004	**BP-HM-RS-04-07**	Modified Sobek 3.2	MT/6480		
10163606007	**BP-HM-RS-01-08**	Modified Sobek 3.2	MT/6480		
10163606008	**BP-HM-RS-02-01**	Modified Sobek 3.2	MT/6480		
10163606002	**BP-HM-RS-03-01**	Modified Sobek 3.2	MT/6452		
10163606004	**BP-HM-RS-04-07**	Modified Sobek 3.2	MT/6452		
10163606007	**BP-HM-RS-01-08**	Modified Sobek 3.2	MT/6452		
10163606008	**BP-HM-RS-02-01**	Modified Sobek 3.2	MT/6452		
10163606002	**BP-HM-RS-03-01**	Modified Sobek 3.2	MT/6499		
10163606004	**BP-HM-RS-04-07**	Modified Sobek 3.2	MT/6499		
10163606007	**BP-HM-RS-01-08**	Modified Sobek 3.2	MT/6499		
10163606008	**BP-HM-RS-02-01**	Modified Sobek 3.2	MT/6499		
10163606002	**BP-HM-RS-03-01**	Modified Sobek 3.2	MT/6481		
10163606004	**BP-HM-RS-04-07**	Modified Sobek 3.2	MT/6481		
10163606007	**BP-HM-RS-01-08**	Modified Sobek 3.2	MT/6481		
10163606008	**BP-HM-RS-02-01**	Modified Sobek 3.2	MT/6481		

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CHAIN-OF-CUSTODY / Analytical Request Document

The Chain-of-Custody is a LEGAL DOCUMENT. All relevant fields must be completed accurately.

Page: 1 of 1

1429992

Section A Required Client Information:

Company: Herrera
Address:
Email To: Khouck@herreraincom
Phone: Fax:
Requested Due Date/TAT:

Section B Required Project Information:

Report To: Kevin Houck
Copy To:
Purchase Order No.:
Project Name: Black Pine Mine
Project Number:

Section C Invoice Information:

Attention:
Company Name: DEQ
Address:
Pace Quote Reference:
Pace Project Manager:
Pace Profile #:

REGULATORY AGENCY

☐ NPDES ☐ GROUND WATER ☐ DRINKING WATER
☐ UST ☐ RCRA ☐ OTHER

Site Location STATE:

Section D Required Client Information

SAMPLE ID
(A-Z, 0-9 / ,-)
Sample IDs MUST BE UNIQUE

Matrix Codes (MATRIX / CODE): Drinking Water DW; Water WT; Waste Water WW; Product P; Soil/Solid SL; Oil OL; Wipe WP; Air AR; Tissue TS; Other OT

Requested Analysis Filtered (Y/N)

10/13/2011 MPK

Total Met = recoverable Sb, As, Ba, Cd, Cr, Co, Cu, Fe, Pb, Mn, Hg, Ni, 2n

ITEM #	SAMPLE ID	MATRIX CODE (see valid codes to left)	SAMPLE TYPE (G=GRAB C=COMP)	COLLECTED COMPOSITE START DATE	COMPOSITE START TIME	COMPOSITE END/GRAB DATE	COMPOSITE END/GRAB TIME	SAMPLE TEMP AT COLLECTION	# OF CONTAINERS	Preservatives: Unpreserved	H_2SO_4	HNO_3	HCl	NaOH	$Na_2S_2O_3$	Methanol	Other	Analysis Test Y/N	Tot. Rec. Metal ABA	Residual Chlorine (Y/N)	Pace Project No./ Lab I.D.
1	BP-HM-SS-03-03	SL	G			7/13/11	1010		1	X								X	X		001
2	BP-HM-RS-03-01	SL	C			7/13/11	1015		2	X								X	XX		002
3	BP-HM-SS-04-10	↓	G			↓	1130		1	X								X	X		003
4	BP-HM-RS-04-07	↓	C			↓	1135		2	X								X	X		004
5	BP-QC-WT-T1	WT	G			7/13/11	1230		1			X						X			005
6	BP-HM-RS-01-16.5	SL	C			7/13/11	1245		1	X								X			006
7	BP-HM-RS-01-08	SL	C			7/13/11	1315		2	X								X	X		007
8	BP-HM-RS-02-01	SL	C			7/13/11	1350		2	X								X	X		008
9	BP-HM-RS-02-03	SL	G			7/13/11	1355		1	X								X			009
10																					
11																					
12																					

ADDITIONAL COMMENTS	RELINQUISHED BY / AFFILIATION	DATE	TIME	ACCEPTED BY / AFFILIATION	DATE	TIME	SAMPLE CONDITIONS
	NCA / HEC	7/13/11	1500		7/13/11	3:00	
	FedEx (G)	7/14/11	0925	Kara Koehler, Pace	7/14/11	0925	5.3 Y Y N

ORIGINAL

SAMPLER NAME AND SIGNATURE

PRINT Name of SAMPLER: ALEX SVENDSEN

SIGNATURE of SAMPLER: [signature] DATE Signed (MM/DD/YY): 7/13/11

Temp in °C | Received on Ice (Y/N) | Custody Sealed Cooler (Y/N) | Samples Intact (Y/N)

*Important Note: By signing this form you are accepting Pace's NET 30 day payment terms and agreeing to late charges of 1.5% per month for any invoices not paid within 30 days.

F-ALL-Q-020rev.07, 15-May-2007

Sample Condition Upon Receipt

Pace Analytical

Client Name: HERRERA MDEQ Project # 10163606

Courier: ☒ Fed Ex ☐ UPS ☐ USPS ☐ Client ☐ Commercial ☐ Pace Other _____

Tracking #: 8797184 1000525

Custody Seal on Cooler/Box Present: ☒ yes ☐ no Seals intact: ☒ yes ☐ no

Packing Material: ☐ Bubble Wrap ☒ Bubble Bags ☐ None ☐ Other _____ Temp Blank: Yes ____ No ☒

Thermometer Used 1383045 or 135 Type of Ice: (Wet) Blue None ☒ Samples on ice, cooling process has begun

Cooler Temperature 5.3 Biological Tissue is Frozen: Yes No

Temp should be above freezing to 6°C

Comments:

Date and Initials of person examining contents: RLW 7/16/11

Chain of Custody Present:	☒Yes ☐No ☐N/A	1.
Chain of Custody Filled Out:	☒Yes ☐No ☐N/A	2.
Chain of Custody Relinquished:	☒Yes ☐No ☐N/A	3.
Sampler Name & Signature on COC:	☒Yes ☐No ☐N/A	4.
Samples Arrived within Hold Time:	☒Yes ☐No ☐N/A	5.
Short Hold Time Analysis (<72hr):	☐Yes ☒No ☐N/A	6.
Rush Turn Around Time Requested:	☐Yes ☒No ☐N/A	7.
Sufficient Volume:	☒Yes ☐No ☐N/A	8.
Correct Containers Used:	☒Yes ☐No ☐N/A	9.
-Pace Containers Used:	☒Yes ☐No ☐N/A	
Containers Intact:	☒Yes ☐No ☐N/A	10.
Filtered volume received for Dissolved tests	☐Yes ☐No ☒N/A	11.
Sample Labels match COC:	☒Yes ☐No ☐N/A	12.
-Includes date/time/ID/Analysis Matrix: Aq/SL		
All containers needing acid/base preservation have been checked. Noncompliance are noted in 13.	☒Yes ☐No ☐N/A	13. ☒ HNO3 ☐ H2SO4 ☐ NaOH ☐ HCl
All containers needing preservation are found to be in compliance with EPA recommendation.	☒Yes ☐No ☐N/A	Samp # 005 (1)
Exceptions: VOA,Coliform, TOC, Oil and Grease, WI-DRO (water)	☐Yes ☒No	Initial when completed RLW / Lot # of added preservative
Samples checked for dechlorination:	☐Yes ☐No ☒N/A	14.
Headspace in VOA Vials (>6mm):	☐Yes ☐No ☒N/A	15.
Trip Blank Present:	☐Yes ☒No ☐N/A	16.
Trip Blank Custody Seals Present	☐Yes ☐No ☒N/A	
Pace Trip Blank Lot # (if purchased): NA		

Client Notification/ Resolution: Field Data Required? Y / N

Person Contacted: _____ Date/Time: _____

Comments/ Resolution: _____

Project Manager Review: _____ **Date:** 7/16/11

Note: Whenever there is a discrepancy affecting North Carolina compliance samples, a copy of this form will be sent to the North Carolina DEHNR Certification Office (i.e out of hold, incorrect preservative, out of temp, incorrect containers)

Pace Analytical Services, Inc.
602 S 25th Street
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(406)254-7226

October 18, 2011

Kevin Houck
Herrera Environmental Consultants
101 East Broadway, Suite 610
Missoula, MT 59802

RE: Project: Black Pine Mine REV
Pace Project No.: 10163633

Dear Kevin Houck:
Enclosed are the analytical results for sample(s) received by the laboratory on July 14, 2011. The results relate only to the samples included in this report.

This report has been revised to add Cobalt and delete Silver.

If you have any questions concerning this report, please feel free to contact me.

Sincerely,

Shawn Davis for
Sally Heinje
sally.heinje@pacelabs.com
Project Manager

Enclosures

cc: Devin Clary, Montana Dept. of Environmental Quality
Mark Donner, Trihydro
Jamie Mongoven, Montana Dept. of Environmental

REPORT OF LABORATORY ANALYSIS

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CERTIFICATIONS

Project: Black Pine Mine REV
Pace Project No.: 10163633

Minnesota Certification IDs

1700 Elm Street SE Suite 200, Minneapolis, MN 55414
A2LA Certification #: 2926.01
Alaska Certification #: UST-078
Alaska Certification #MN00064
Arizona Certification #: AZ-0014
Arkansas Certification #: 88-0680
California Certification #: 01155CA
EPA Region 8 Certification #: Pace
Florida/NELAP Certification #: E87605
Georgia Certification #: 959
Idaho Certification #: MN00064
Illinois Certification #: 200011
Iowa Certification #: 368
Kansas Certification #: E-10167
Louisiana Certification #: 03086
Louisiana Certification #: LA080009
Maine Certification #: 2007029
Maryland Certification #: 322
Michigan DEQ Certification #: 9909
Minnesota Certification #: 027-053-137
Mississippi Certification #: Pace
Montana Certification #: MT CERT0092
Nevada Certification #: MN_00064
Nebraska Certification #: Pace
New Jersey Certification #: MN-002
New Mexico Certification #: Pace
New York Certification #: 11647
North Carolina Certification #: 530
North Dakota Certification #: R-036
North Dakota Certification #: R-036A
Ohio VAP Certification #: CL101
Oklahoma Certification #: D9921
Oklahoma Certification #: 9507
Oregon Certification #: MN200001
Pennsylvania Certification #: 68-00563
Puerto Rico Certification
Tennessee Certification #: 02818
Texas Certification #: T104704192
Washington Certification #: C754
Wisconsin Certification #: 999407970

Montana Certification IDs

602 South 25th Street, Billings, MT 59101
EPA Region 8 Certification #: 8TMS-Q
Idaho Certification #: MT00012
Montana Certification #: MT CERT0040
NVLAP Certification #: 101292-0
Minnesota Dept of Health Certification #: 030-999-442

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SAMPLE SUMMARY

Project: Black Pine Mine REV
Pace Project No.: 10163633

Lab ID	Sample ID	Matrix	Date Collected	Date Received
10163633001	**BP-HM-RS-07-01**	Solid	07/13/11 15:20	07/14/11 21:00
10163633002	**BP-HM-RS-06-01**	Solid	07/13/11 15:50	07/14/11 21:00
10163633003	**BP-HM-RS-05-02**	Solid	07/13/11 16:20	07/14/11 21:00
10163633004	**BP-HM-RS-05-05**	Solid	07/13/11 16:15	07/14/11 21:00
10163633005	**BP-HM-SS-07-03**	Solid	07/13/11 15:27	07/14/11 21:00
10163633006	**BP-HM-RS-06-08**	Solid	07/13/11 16:10	07/14/11 21:00
10163633007	**BP-CMN-SS-05-08**	Solid	07/14/11 10:00	07/14/11 21:00
10163633008	**BP-CMN-RS-05-05**	Solid	07/14/11 10:05	07/14/11 21:00
10163633009	**BP-CMN-SS-05-00**	Solid	07/14/11 10:10	07/14/11 21:00
10163633010	**BP-CMN-SS-06-06**	Solid	07/14/11 11:15	07/14/11 21:00
10163633011	**BP-CMN-RS-06-02**	Solid	07/14/11 11:20	07/14/11 21:00
10163633012	**BP-CMN-RS-06-00**	Solid	07/14/11 11:25	07/14/11 21:00

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SAMPLE ANALYTE COUNT

Project: Black Pine Mine REV
Pace Project No.: 10163633

Lab ID	Sample ID	Method	Analysts	Analytes Reported	Laboratory
10163633001	**BP-HM-RS-07-01**	EPA 6020	TL1	12	PASI-M
		EPA 7471	TEM	1	PASI-M
		% Moisture	JDL	1	PASI-M
		Modified Sobek 3.2	JH1	1	PASI-MT
		Modified Sobek 3.2	JH1	5	PASI-MT
		Modified Sobek 3.2	JH1	4	PASI-MT
		Modified Sobek 3.2	JH1	1	PASI-MT
10163633002	**BP-HM-RS-06-01**	EPA 6020	TL1	12	PASI-M
		EPA 7471	TEM	1	PASI-M
		% Moisture	JDL	1	PASI-M
		Modified Sobek 3.2	JH1	1	PASI-MT
		Modified Sobek 3.2	JH1	5	PASI-MT
		Modified Sobek 3.2	JH1	4	PASI-MT
		Modified Sobek 3.2	JH1	1	PASI-MT
10163633003	**BP-HM-RS-05-02**	EPA 6020	TL1	12	PASI-M
		EPA 7471	TEM	1	PASI-M
		% Moisture	JDL	1	PASI-M
		Modified Sobek 3.2	JH1	1	PASI-MT
		Modified Sobek 3.2	JH1	5	PASI-MT
		Modified Sobek 3.2	JH1	4	PASI-MT
		Modified Sobek 3.2	JH1	1	PASI-MT
10163633004	**BP-HM-RS-05-05**	EPA 6020	TL1	12	PASI-M
		EPA 7471	TEM	1	PASI-M
		% Moisture	JDL	1	PASI-M
10163633005	**BP-HM-SS-07-03**	EPA 6020	TL1	12	PASI-M
		EPA 7471	TEM	1	PASI-M
		% Moisture	JDL	1	PASI-M
10163633006	**BP-HM-RS-06-08**	EPA 6020	TL1	12	PASI-M
		EPA 7471	TEM	1	PASI-M
		% Moisture	JDL	1	PASI-M
10163633007	**BP-CMN-SS-05-08**	EPA 6020	TL1	12	PASI-M
		EPA 7471	TEM	1	PASI-M
		% Moisture	JDL	1	PASI-M
10163633008	**BP-CMN-RS-05-05**	EPA 6020	TL1	12	PASI-M
		EPA 7471	TEM	1	PASI-M
		% Moisture	JDL	1	PASI-M
		Modified Sobek 3.2	JH1	1	PASI-MT

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SAMPLE ANALYTE COUNT

Project: Black Pine Mine REV
Pace Project No.: 10163633

Lab ID	Sample ID	Method	Analysts	Analytes Reported	Laboratory
		Modified Sobek 3.2	JH1	5	PASI-MT
		Modified Sobek 3.2	JH1	4	PASI-MT
		Modified Sobek 3.2	JH1	1	PASI-MT
10163633009	**BP-CMN-SS-05-00**	EPA 6020	TL1	12	PASI-M
		EPA 7471	TEM	1	PASI-M
		% Moisture	JDL	1	PASI-M
		Modified Sobek 3.2	JH1	1	PASI-MT
		Modified Sobek 3.2	JH1	5	PASI-MT
		Modified Sobek 3.2	JH1	4	PASI-MT
		Modified Sobek 3.2	JH1	1	PASI-MT
10163633010	**BP-CMN-SS-06-06**	EPA 6020	TL1	12	PASI-M
		EPA 7471	TEM	1	PASI-M
		% Moisture	JDL	1	PASI-M
10163633011	**BP-CMN-RS-06-02**	EPA 6020	TL1	12	PASI-M
		EPA 7471	TEM	1	PASI-M
		% Moisture	JDL	1	PASI-M
		Modified Sobek 3.2	JH1	1	PASI-MT
		Modified Sobek 3.2	JH1	5	PASI-MT
		Modified Sobek 3.2	JH1	4	PASI-MT
		Modified Sobek 3.2	JH1	1	PASI-MT
10163633012	**BP-CMN-RS-06-00**	EPA 6020	TL1	12	PASI-M
		EPA 7471	TEM	1	PASI-M
		% Moisture	JDL	1	PASI-M
		Modified Sobek 3.2	JH1	1	PASI-MT
		Modified Sobek 3.2	JH1	5	PASI-MT
		Modified Sobek 3.2	JH1	4	PASI-MT
		Modified Sobek 3.2	JH1	1	PASI-MT

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PROJECT NARRATIVE

Project: Black Pine Mine REV
Pace Project No.: 10163633

Method: **EPA 6020**
Description: 6020 MET ICPMS
Client: Montana Dept. of Environmental Quality
Date: October 18, 2011

General Information:
12 samples were analyzed for EPA 6020. All samples were received in acceptable condition with any exceptions noted below.

Hold Time:
The samples were analyzed within the method required hold times with any exceptions noted below.

Sample Preparation:
The samples were prepared in accordance with EPA 3050 with any exceptions noted below.

Initial Calibrations (including MS Tune as applicable):
All criteria were within method requirements with any exceptions noted below.

Continuing Calibration:
All criteria were within method requirements with any exceptions noted below.

Internal Standards:
All internal standards were within QC limits with any exceptions noted below.

Method Blank:
All analytes were below the report limit in the method blank with any exceptions noted below.

Laboratory Control Spike:
All laboratory control spike compounds were within QC limits with any exceptions noted below.

Matrix Spikes:
All percent recoveries and relative percent differences (RPDs) were within acceptance criteria with any exceptions noted below.

QC Batch: MPRP/27166

A matrix spike and matrix spike duplicate (MS/MSD) were performed on the following sample(s): 10163633001,10163633011

M6: Matrix spike and Matrix spike duplicate recovery not evaluated against control limits due to sample dilution.

- MS (Lab ID: 1014850)
  - Antimony
  - Arsenic
  - Barium
  - Cadmium
  - Chromium
  - Copper
  - Iron
  - Lead
  - Manganese
  - Nickel
  - Zinc
- MS (Lab ID: 1014852)
  - Antimony

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PROJECT NARRATIVE

Project: Black Pine Mine REV
Pace Project No.: 10163633

Method: **EPA 6020**
Description: 6020 MET ICPMS
Client: Montana Dept. of Environmental Quality
Date: October 18, 2011

QC Batch: MPRP/27166

A matrix spike and matrix spike duplicate (MS/MSD) were performed on the following sample(s): 10163633001,10163633011

M6: Matrix spike and Matrix spike duplicate recovery not evaluated against control limits due to sample dilution.

- Arsenic
- Barium
- Cadmium
- Chromium
- Copper
- Iron
- Lead
- Manganese
- Nickel
- Zinc

- MSD (Lab ID: 1014851)
  - Antimony
  - Arsenic
  - Barium
  - Cadmium
  - Chromium
  - Copper
  - Iron
  - Lead
  - Manganese
  - Nickel
  - Zinc

Duplicate Sample:
All duplicate sample results were within method acceptance criteria with any exceptions noted below.

Additional Comments:

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PROJECT NARRATIVE

Project: Black Pine Mine REV
Pace Project No.: 10163633

Method: **EPA 7471**
Description: 7471 Mercury
Client: Montana Dept. of Environmental Quality
Date: October 18, 2011

General Information:
12 samples were analyzed for EPA 7471. All samples were received in acceptable condition with any exceptions noted below.

Hold Time:
The samples were analyzed within the method required hold times with any exceptions noted below.

Sample Preparation:
The samples were prepared in accordance with EPA 7471 with any exceptions noted below.

Initial Calibrations (including MS Tune as applicable):
All criteria were within method requirements with any exceptions noted below.

Continuing Calibration:
All criteria were within method requirements with any exceptions noted below.

Method Blank:
All analytes were below the report limit in the method blank with any exceptions noted below.

Laboratory Control Spike:
All laboratory control spike compounds were within QC limits with any exceptions noted below.

Matrix Spikes:
All percent recoveries and relative percent differences (RPDs) were within acceptance criteria with any exceptions noted below.

QC Batch: MERP/5649

A matrix spike and matrix spike duplicate (MS/MSD) were performed on the following sample(s): 10163633001,10163634008

M1: Matrix spike recovery exceeded QC limits. Batch accepted based on laboratory control sample (LCS) recovery.

- MS (Lab ID: 1016606)
  - Mercury

M6: Matrix spike and Matrix spike duplicate recovery not evaluated against control limits due to sample dilution.

- MS (Lab ID: 1016604)
  - Mercury
- MSD (Lab ID: 1016605)
  - Mercury

Duplicate Sample:
All duplicate sample results were within method acceptance criteria with any exceptions noted below.

Additional Comments:

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PROJECT NARRATIVE

Project: Black Pine Mine REV
Pace Project No.: 10163633

Method: **Modified Sobek 3.2**
Description: Sobek Acid Base Potential
Client: Montana Dept. of Environmental Quality
Date: October 18, 2011

General Information:
7 samples were analyzed for Modified Sobek 3.2. All samples were received in acceptable condition with any exceptions noted below.

Hold Time:
The samples were analyzed within the method required hold times with any exceptions noted below.

Initial Calibrations (including MS Tune as applicable):
All criteria were within method requirements with any exceptions noted below.

Continuing Calibration:
All criteria were within method requirements with any exceptions noted below.

Internal Standards:
All internal standards were within QC limits with any exceptions noted below.

Surrogates:
All surrogates were within QC limits with any exceptions noted below.

Method Blank:
All analytes were below the report limit in the method blank with any exceptions noted below.

Laboratory Control Spike:
All laboratory control spike compounds were within QC limits with any exceptions noted below.

Matrix Spikes:
All percent recoveries and relative percent differences (RPDs) were within acceptance criteria with any exceptions noted below.

Duplicate Sample:
All duplicate sample results were within method acceptance criteria with any exceptions noted below.

Additional Comments:

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PROJECT NARRATIVE

Project: Black Pine Mine REV
Pace Project No.: 10163633

Method: **Modified Sobek 3.2**
Description: Sobek Extractable Sulfur
Client: Montana Dept. of Environmental Quality
Date: October 18, 2011

General Information:
7 samples were analyzed for Modified Sobek 3.2. All samples were received in acceptable condition with any exceptions noted below.

Hold Time:
The samples were analyzed within the method required hold times with any exceptions noted below.

Initial Calibrations (including MS Tune as applicable):
All criteria were within method requirements with any exceptions noted below.

Continuing Calibration:
All criteria were within method requirements with any exceptions noted below.

Internal Standards:
All internal standards were within QC limits with any exceptions noted below.

Surrogates:
All surrogates were within QC limits with any exceptions noted below.

Method Blank:
All analytes were below the report limit in the method blank with any exceptions noted below.

Laboratory Control Spike:
All laboratory control spike compounds were within QC limits with any exceptions noted below.

Matrix Spikes:
All percent recoveries and relative percent differences (RPDs) were within acceptance criteria with any exceptions noted below.

Duplicate Sample:
All duplicate sample results were within method acceptance criteria with any exceptions noted below.

Additional Comments:

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PROJECT NARRATIVE

Project: Black Pine Mine REV
Pace Project No.: 10163633

Method: **Modified Sobek 3.2**
Description: Sobek Calculations
Client: Montana Dept. of Environmental Quality
Date: October 18, 2011

General Information:
7 samples were analyzed for Modified Sobek 3.2. All samples were received in acceptable condition with any exceptions noted below.

Hold Time:
The samples were analyzed within the method required hold times with any exceptions noted below.

Initial Calibrations (including MS Tune as applicable):
All criteria were within method requirements with any exceptions noted below.

Continuing Calibration:
All criteria were within method requirements with any exceptions noted below.

Internal Standards:
All internal standards were within QC limits with any exceptions noted below.

Surrogates:
All surrogates were within QC limits with any exceptions noted below.

Method Blank:
All analytes were below the report limit in the method blank with any exceptions noted below.

Laboratory Control Spike:
All laboratory control spike compounds were within QC limits with any exceptions noted below.

Matrix Spikes:
All percent recoveries and relative percent differences (RPDs) were within acceptance criteria with any exceptions noted below.

Duplicate Sample:
All duplicate sample results were within method acceptance criteria with any exceptions noted below.

Additional Comments:

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PROJECT NARRATIVE

Project: Black Pine Mine REV
Pace Project No.: 10163633

Method: **Modified Sobek 3.2**
Description: Sobek SMP Buffer pH
Client: Montana Dept. of Environmental Quality
Date: October 18, 2011

General Information:
7 samples were analyzed for Modified Sobek 3.2. All samples were received in acceptable condition with any exceptions noted below.

Hold Time:
The samples were analyzed within the method required hold times with any exceptions noted below.

Initial Calibrations (including MS Tune as applicable):
All criteria were within method requirements with any exceptions noted below.

Continuing Calibration:
All criteria were within method requirements with any exceptions noted below.

Internal Standards:
All internal standards were within QC limits with any exceptions noted below.

Surrogates:
All surrogates were within QC limits with any exceptions noted below.

Method Blank:
All analytes were below the report limit in the method blank with any exceptions noted below.

Laboratory Control Spike:
All laboratory control spike compounds were within QC limits with any exceptions noted below.

Matrix Spikes:
All percent recoveries and relative percent differences (RPDs) were within acceptance criteria with any exceptions noted below.

Duplicate Sample:
All duplicate sample results were within method acceptance criteria with any exceptions noted below.

Additional Comments:

This data package has been reviewed for quality and completeness and is approved for release.

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ANALYTICAL RESULTS

Project: Black Pine Mine REV
Pace Project No.: 10163633

Sample: BP-HM-RS-07-01 **Lab ID: 10163633001** Collected: 07/13/11 15:20 Received: 07/14/11 21:00 Matrix: Solid

Results reported on a "dry-weight" basis

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
6020 MET ICPMS	Analytical Method: EPA 6020 Preparation Method: EPA 3050							
Antimony	**1380**	mg/kg	2.8	100	08/01/11 15:37	08/03/11 15:58	7440-36-0	M6
Arsenic	**1380**	mg/kg	2.8	100	08/01/11 15:37	08/03/11 15:58	7440-38-2	M6
Barium	**247**	mg/kg	1.7	100	08/01/11 15:37	08/03/11 15:58	7440-39-3	M6
Cadmium	**20.6**	mg/kg	0.45	100	08/01/11 15:37	08/03/11 15:58	7440-43-9	M6
Chromium	**2.7**	mg/kg	0.56	20	08/01/11 15:37	08/03/11 15:55	7440-47-3	M6
Cobalt	**1.1**	mg/kg	0.56	20	08/01/11 15:37	08/03/11 15:55	7440-48-4	
Copper	**1280**	mg/kg	2.8	100	08/01/11 15:37	08/03/11 15:58	7440-50-8	M6
Iron	**23100**	mg/kg	281	100	08/01/11 15:37	08/03/11 15:58	7439-89-6	M6
Lead	**6960**	mg/kg	2.2	400	08/01/11 15:37	08/04/11 13:35	7439-92-1	M6
Manganese	**270**	mg/kg	2.8	100	08/01/11 15:37	08/03/11 15:58	7439-96-5	M6
Nickel	**<2.8**	mg/kg	2.8	100	08/01/11 15:37	08/03/11 15:58	7440-02-0	M6
Zinc	**332**	mg/kg	28.1	100	08/01/11 15:37	08/03/11 15:58	7440-66-6	M6
7471 Mercury	Analytical Method: EPA 7471 Preparation Method: EPA 7471							
Mercury	**7.0**	mg/kg	0.22	10	07/28/11 19:18	08/01/11 15:33	7439-97-6	M6
Dry Weight	Analytical Method: % Moisture							
Percent Moisture	**11.0**	%	0.10	1		07/22/11 00:00		
Sobek Acid Base Potential	Analytical Method: Modified Sobek 3.2							
Neutralization Potential	**<0.5**	tons/1000	0.50	1		08/02/11 00:00		
Sobek Extractable Sulfur	Analytical Method: Modified Sobek 3.2							
Sulfur, HCl Extractable	**0.0937**	% (w/w)	0.050	1		08/01/11 15:50		
Sulfur, HNO3 Extractable	**0.0559**	% (w/w)	0.050	1		08/01/11 15:50		
Sulfur, Hot Water Extractable	**0.183**	% (w/w)	0.050	1		08/01/11 15:50		
Sulfur, Residual	**<0.050**	% (w/w)	0.050	1		08/01/11 15:50		
Total Sulfur	**0.339**	% (w/w)	0.050	1		08/01/11 15:50		
Sobek Calculations	Analytical Method: Modified Sobek 3.2							
Acid/Base Potential	**0**	tons/1000		1		08/02/11 00:00		
Acid Potential	**<4.3**	tons/1000	4.3	1		08/02/11 00:00		
Lime Requirement	**11**	tons/1000	5.4	1		08/02/11 00:00		
SMP Lime Requirement	**4.6**	tons/1000	0.0	1		08/02/11 00:00		
Sobek SMP Buffer pH	Analytical Method: Modified Sobek 3.2							
SMP Buffer pH	**6.3**	Std. Units	0.10	1		07/26/11 09:40		

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ANALYTICAL RESULTS

Project: Black Pine Mine REV
Pace Project No.: 10163633

Sample: BP-HM-RS-06-01 **Lab ID: 10163633002** Collected: 07/13/11 15:50 Received: 07/14/11 21:00 Matrix: Solid

Results reported on a "dry-weight" basis

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
6020 MET ICPMS	Analytical Method: EPA 6020 Preparation Method: EPA 3050							
Antimony	**1020**	mg/kg	9.9	400	08/01/11 15:37	08/03/11 16:04	7440-36-0	
Arsenic	**1190**	mg/kg	9.9	400	08/01/11 15:37	08/03/11 16:04	7440-38-2	
Barium	**261**	mg/kg	0.30	20	08/01/11 15:37	08/03/11 16:01	7440-39-3	
Cadmium	**22.8**	mg/kg	1.6	400	08/01/11 15:37	08/03/11 16:04	7440-43-9	
Chromium	**4.1**	mg/kg	0.50	20	08/01/11 15:37	08/03/11 16:01	7440-47-3	
Cobalt	**2.8**	mg/kg	0.50	20	08/01/11 15:37	08/03/11 16:01	7440-48-4	
Copper	**3310**	mg/kg	9.9	400	08/01/11 15:37	08/03/11 16:04	7440-50-8	
Iron	**28900**	mg/kg	995	400	08/01/11 15:37	08/03/11 16:04	7439-89-6	
Lead	**4980**	mg/kg	2.0	400	08/01/11 15:37	08/03/11 16:04	7439-92-1	
Manganese	**682**	mg/kg	9.9	400	08/01/11 15:37	08/03/11 16:04	7439-96-5	
Nickel	**<9.9**	mg/kg	9.9	400	08/01/11 15:37	08/03/11 16:04	7440-02-0	
Zinc	**395**	mg/kg	99.5	400	08/01/11 15:37	08/03/11 16:04	7440-66-6	
7471 Mercury	Analytical Method: EPA 7471 Preparation Method: EPA 7471							
Mercury	**0.56**	mg/kg	0.020	1	07/28/11 19:18	08/01/11 15:47	7439-97-6	
Dry Weight	Analytical Method: % Moisture							
Percent Moisture	**7.8**	%	0.10	1		07/22/11 00:00		
Sobek Acid Base Potential	Analytical Method: Modified Sobek 3.2							
Neutralization Potential	**<0.5**	tons/1000	0.50	1		08/02/11 00:00		
Sobek Extractable Sulfur	Analytical Method: Modified Sobek 3.2							
Sulfur, HCl Extractable	**<0.050**	% (w/w)	0.050	1		08/01/11 16:02		
Sulfur, HNO3 Extractable	**<0.050**	% (w/w)	0.050	1		08/01/11 16:02		
Sulfur, Hot Water Extractable	**0.0542**	% (w/w)	0.050	1		08/01/11 16:02		
Sulfur, Residual	**<0.050**	% (w/w)	0.050	1		08/01/11 16:02		
Total Sulfur	**0.0912**	% (w/w)	0.050	1		08/01/11 16:02		
Sobek Calculations	Analytical Method: Modified Sobek 3.2							
Acid/Base Potential	**0**	tons/1000		1		08/02/11 00:00		
Acid Potential	**<4.3**	tons/1000	4.3	1		08/02/11 00:00		
Lime Requirement	**<5.4**	tons/1000	5.4	1		08/02/11 00:00		
SMP Lime Requirement	**0.30**	tons/1000	0.0	1		08/02/11 00:00		
Sobek SMP Buffer pH	Analytical Method: Modified Sobek 3.2							
SMP Buffer pH	**6.9**	Std. Units	0.10	1		07/26/11 09:40		

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ANALYTICAL RESULTS

Project: Black Pine Mine REV
Pace Project No.: 10163633

Sample: BP-HM-RS-05-02 **Lab ID: 10163633003** Collected: 07/13/11 16:20 Received: 07/14/11 21:00 Matrix: Solid

Results reported on a "dry-weight" basis

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
6020 MET ICPMS	Analytical Method: EPA 6020 Preparation Method: EPA 3050							
Antimony	**50.3**	mg/kg	0.52	20	08/01/11 15:37	08/03/11 16:07	7440-36-0	
Arsenic	**61.3**	mg/kg	10.4	400	08/01/11 15:37	08/03/11 16:11	7440-38-2	
Barium	**153**	mg/kg	0.31	20	08/01/11 15:37	08/03/11 16:07	7440-39-3	
Cadmium	**1.2**	mg/kg	0.083	20	08/01/11 15:37	08/03/11 16:07	7440-43-9	
Chromium	**8.9**	mg/kg	0.52	20	08/01/11 15:37	08/03/11 16:07	7440-47-3	
Cobalt	**9.9**	mg/kg	0.52	20	08/01/11 15:37	08/03/11 16:07	7440-48-4	
Copper	**193**	mg/kg	10.4	400	08/01/11 15:37	08/03/11 16:11	7440-50-8	
Iron	**11700**	mg/kg	52.1	20	08/01/11 15:37	08/03/11 16:07	7439-89-6	
Lead	**401**	mg/kg	0.10	20	08/01/11 15:37	08/03/11 16:07	7439-92-1	
Manganese	**465**	mg/kg	0.52	20	08/01/11 15:37	08/03/11 16:07	7439-96-5	
Nickel	**13.7**	mg/kg	10.4	400	08/01/11 15:37	08/03/11 16:11	7440-02-0	
Zinc	**<104**	mg/kg	104	400	08/01/11 15:37	08/03/11 16:11	7440-66-6	
7471 Mercury	Analytical Method: EPA 7471 Preparation Method: EPA 7471							
Mercury	**0.094**	mg/kg	0.018	1	07/28/11 19:18	08/01/11 15:49	7439-97-6	
Dry Weight	Analytical Method: % Moisture							
Percent Moisture	**11.9**	%	0.10	1		07/22/11 00:00		
Sobek Acid Base Potential	Analytical Method: Modified Sobek 3.2							
Neutralization Potential	**0.73**	tons/1000	0.50	1		08/02/11 00:00		
Sobek Extractable Sulfur	Analytical Method: Modified Sobek 3.2							
Sulfur, HCl Extractable	**<0.050**	% (w/w)	0.050	1		08/01/11 16:16		
Sulfur, HNO3 Extractable	**<0.050**	% (w/w)	0.050	1		08/01/11 16:16		
Sulfur, Hot Water Extractable	**<0.050**	% (w/w)	0.050	1		08/01/11 16:16		
Sulfur, Residual	**<0.050**	% (w/w)	0.050	1		08/01/11 16:16		
Total Sulfur	**<0.050**	% (w/w)	0.050	1		08/01/11 16:16		
Sobek Calculations	Analytical Method: Modified Sobek 3.2							
Acid/Base Potential	**0.73**	tons/1000		1		08/02/11 00:00		
Acid Potential	**<4.3**	tons/1000	4.3	1		08/02/11 00:00		
Lime Requirement	**<5.4**	tons/1000	5.4	1		08/02/11 00:00		
SMP Lime Requirement	**0.30**	tons/1000	0.0	1		08/02/11 00:00		
Sobek SMP Buffer pH	Analytical Method: Modified Sobek 3.2							
SMP Buffer pH	**6.9**	Std. Units	0.10	1		07/26/11 09:40		

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ANALYTICAL RESULTS

Project: Black Pine Mine REV
Pace Project No.: 10163633

Sample: BP-HM-RS-05-05 **Lab ID: 10163633004** Collected: 07/13/11 16:15 Received: 07/14/11 21:00 Matrix: Solid

Results reported on a "dry-weight" basis

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
6020 MET ICPMS	Analytical Method: EPA 6020 Preparation Method: EPA 3050							
Antimony	**18.1**	mg/kg	0.52	20	08/01/11 15:37	08/03/11 16:33	7440-36-0	
Arsenic	**22.4**	mg/kg	0.52	20	08/01/11 15:37	08/03/11 16:33	7440-38-2	
Barium	**77.8**	mg/kg	0.31	20	08/01/11 15:37	08/03/11 16:33	7440-39-3	
Cadmium	**0.91**	mg/kg	0.084	20	08/01/11 15:37	08/03/11 16:33	7440-43-9	
Chromium	**7.7**	mg/kg	0.52	20	08/01/11 15:37	08/03/11 16:33	7440-47-3	
Cobalt	**5.3**	mg/kg	0.52	20	08/01/11 15:37	08/03/11 16:33	7440-48-4	
Copper	**57.9**	mg/kg	0.52	20	08/01/11 15:37	08/03/11 16:33	7440-50-8	
Iron	**9340**	mg/kg	52.4	20	08/01/11 15:37	08/03/11 16:33	7439-89-6	
Lead	**149**	mg/kg	0.10	20	08/01/11 15:37	08/03/11 16:33	7439-92-1	
Manganese	**197**	mg/kg	0.52	20	08/01/11 15:37	08/03/11 16:33	7439-96-5	
Nickel	**8.5**	mg/kg	0.52	20	08/01/11 15:37	08/03/11 16:33	7440-02-0	
Zinc	**26.2**	mg/kg	5.2	20	08/01/11 15:37	08/03/11 16:33	7440-66-6	
7471 Mercury	Analytical Method: EPA 7471 Preparation Method: EPA 7471							
Mercury	**0.059**	mg/kg	0.021	1	07/28/11 19:18	08/01/11 15:51	7439-97-6	
Dry Weight	Analytical Method: % Moisture							
Percent Moisture	**9.2**	%	0.10	1		07/22/11 00:00		

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ANALYTICAL RESULTS

Project: Black Pine Mine REV
Pace Project No.: 10163633

Sample: BP-HM-SS-07-03 **Lab ID: 10163633005** Collected: 07/13/11 15:27 Received: 07/14/11 21:00 Matrix: Solid

Results reported on a "dry-weight" basis

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
6020 MET ICPMS	Analytical Method: EPA 6020 Preparation Method: EPA 3050							
Antimony	**142**	mg/kg	0.55	20	08/01/11 15:37	08/03/11 16:40	7440-36-0	
Arsenic	**154**	mg/kg	0.55	20	08/01/11 15:37	08/03/11 16:40	7440-38-2	
Barium	**433**	mg/kg	0.33	20	08/01/11 15:37	08/03/11 16:40	7440-39-3	
Cadmium	**5.9**	mg/kg	0.089	20	08/01/11 15:37	08/03/11 16:40	7440-43-9	
Chromium	**7.0**	mg/kg	0.55	20	08/01/11 15:37	08/03/11 16:40	7440-47-3	
Cobalt	**6.8**	mg/kg	0.55	20	08/01/11 15:37	08/03/11 16:40	7440-48-4	
Copper	**3440**	mg/kg	11.1	400	08/01/11 15:37	08/04/11 13:38	7440-50-8	
Iron	**12300**	mg/kg	55.4	20	08/01/11 15:37	08/03/11 16:40	7439-89-6	
Lead	**1020**	mg/kg	0.55	100	08/01/11 15:37	08/03/11 16:43	7439-92-1	
Manganese	**2320**	mg/kg	2.8	100	08/01/11 15:37	08/03/11 16:43	7439-96-5	
Nickel	**10.9**	mg/kg	0.55	20	08/01/11 15:37	08/03/11 16:40	7440-02-0	
Zinc	**124**	mg/kg	5.5	20	08/01/11 15:37	08/03/11 16:40	7440-66-6	
7471 Mercury	Analytical Method: EPA 7471 Preparation Method: EPA 7471							
Mercury	**8.5**	mg/kg	0.25	10	07/28/11 19:18	08/01/11 16:02	7439-97-6	
Dry Weight	Analytical Method: % Moisture							
Percent Moisture	**21.5**	%	0.10	1		07/22/11 00:00		

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ANALYTICAL RESULTS

Project: Black Pine Mine REV
Pace Project No.: 10163633

Sample: BP-HM-RS-06-08 **Lab ID: 10163633006** Collected: 07/13/11 16:10 Received: 07/14/11 21:00 Matrix: Solid

Results reported on a "dry-weight" basis

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
6020 MET ICPMS	Analytical Method: EPA 6020 Preparation Method: EPA 3050							
Antimony	**188**	mg/kg	0.50	20	08/01/11 15:37	08/03/11 16:46	7440-36-0	
Arsenic	**209**	mg/kg	10	400	08/01/11 15:37	08/03/11 16:49	7440-38-2	
Barium	**155**	mg/kg	0.30	20	08/01/11 15:37	08/03/11 16:46	7440-39-3	
Cadmium	**4.0**	mg/kg	0.080	20	08/01/11 15:37	08/03/11 16:46	7440-43-9	
Chromium	**12.2**	mg/kg	0.50	20	08/01/11 15:37	08/03/11 16:46	7440-47-3	
Cobalt	**9.8**	mg/kg	0.50	20	08/01/11 15:37	08/03/11 16:46	7440-48-4	
Copper	**441**	mg/kg	10	400	08/01/11 15:37	08/03/11 16:49	7440-50-8	
Iron	**21000**	mg/kg	50.0	20	08/01/11 15:37	08/03/11 16:46	7439-89-6	
Lead	**1500**	mg/kg	2.0	400	08/01/11 15:37	08/03/11 16:49	7439-92-1	
Manganese	**282**	mg/kg	0.50	20	08/01/11 15:37	08/03/11 16:46	7439-96-5	
Nickel	**14.9**	mg/kg	10	400	08/01/11 15:37	08/03/11 16:49	7440-02-0	
Zinc	**<100**	mg/kg	100	400	08/01/11 15:37	08/03/11 16:49	7440-66-6	
7471 Mercury	Analytical Method: EPA 7471 Preparation Method: EPA 7471							
Mercury	**0.040**	mg/kg	0.022	1	07/28/11 19:18	08/01/11 16:04	7439-97-6	
Dry Weight	Analytical Method: % Moisture							
Percent Moisture	**9.9**	%	0.10	1		07/22/11 00:00		

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ANALYTICAL RESULTS

Project: Black Pine Mine REV
Pace Project No.: 10163633

Sample: BP-CMN-SS-05-08 **Lab ID: 10163633007** Collected: 07/14/11 10:00 Received: 07/14/11 21:00 Matrix: Solid

Results reported on a "dry-weight" basis

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
6020 MET ICPMS	Analytical Method: EPA 6020 Preparation Method: EPA 3050							
Antimony	**1.4**	mg/kg	0.50	20	08/01/11 15:37	08/03/11 16:52	7440-36-0	
Arsenic	**7.7**	mg/kg	0.50	20	08/01/11 15:37	08/03/11 16:52	7440-38-2	
Barium	**97.0**	mg/kg	0.30	20	08/01/11 15:37	08/03/11 16:52	7440-39-3	
Cadmium	**<0.080**	mg/kg	0.080	20	08/01/11 15:37	08/03/11 16:52	7440-43-9	
Chromium	**6.7**	mg/kg	0.50	20	08/01/11 15:37	08/03/11 16:52	7440-47-3	
Cobalt	**5.4**	mg/kg	0.50	20	08/01/11 15:37	08/03/11 16:52	7440-48-4	
Copper	**8.7**	mg/kg	0.50	20	08/01/11 15:37	08/03/11 16:52	7440-50-8	
Iron	**7960**	mg/kg	50.1	20	08/01/11 15:37	08/03/11 16:52	7439-89-6	
Lead	**14.9**	mg/kg	0.10	20	08/01/11 15:37	08/03/11 16:52	7439-92-1	
Manganese	**137**	mg/kg	0.50	20	08/01/11 15:37	08/03/11 16:52	7439-96-5	
Nickel	**5.8**	mg/kg	0.50	20	08/01/11 15:37	08/03/11 16:52	7440-02-0	
Zinc	**25.7**	mg/kg	5.0	20	08/01/11 15:37	08/03/11 16:52	7440-66-6	
7471 Mercury	Analytical Method: EPA 7471 Preparation Method: EPA 7471							
Mercury	**<0.022**	mg/kg	0.022	1	07/28/11 19:18	08/01/11 16:06	7439-97-6	
Dry Weight	Analytical Method: % Moisture							
Percent Moisture	**11.8**	%	0.10	1		07/22/11 00:00		

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ANALYTICAL RESULTS

Project: Black Pine Mine REV
Pace Project No.: 10163633

Sample: BP-CMN-RS-05-05 **Lab ID: 10163633008** Collected: 07/14/11 10:05 Received: 07/14/11 21:00 Matrix: Solid

Results reported on a "dry-weight" basis

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
6020 MET ICPMS	Analytical Method: EPA 6020 Preparation Method: EPA 3050							
Antimony	**678**	mg/kg	2.7	100	08/01/11 15:37	08/03/11 17:02	7440-36-0	
Arsenic	**467**	mg/kg	2.7	100	08/01/11 15:37	08/03/11 17:02	7440-38-2	
Barium	**244**	mg/kg	0.32	20	08/01/11 15:37	08/03/11 16:59	7440-39-3	
Cadmium	**13.7**	mg/kg	0.086	20	08/01/11 15:37	08/03/11 16:59	7440-43-9	
Chromium	**3.0**	mg/kg	2.7	100	08/01/11 15:37	08/03/11 17:02	7440-47-3	
Cobalt	**4.1**	mg/kg	0.54	20	08/01/11 15:37	08/03/11 16:59	7440-48-4	
Copper	**1950**	mg/kg	2.7	100	08/01/11 15:37	08/03/11 17:02	7440-50-8	
Iron	**12500**	mg/kg	269	100	08/01/11 15:37	08/03/11 17:02	7439-89-6	
Lead	**3050**	mg/kg	2.2	400	08/01/11 15:37	08/04/11 13:42	7439-92-1	
Manganese	**850**	mg/kg	2.7	100	08/01/11 15:37	08/03/11 17:02	7439-96-5	
Nickel	**4.4**	mg/kg	2.7	100	08/01/11 15:37	08/03/11 17:02	7440-02-0	
Zinc	**923**	mg/kg	26.9	100	08/01/11 15:37	08/03/11 17:02	7440-66-6	
7471 Mercury	Analytical Method: EPA 7471 Preparation Method: EPA 7471							
Mercury	**0.27**	mg/kg	0.018	1	07/28/11 19:18	08/01/11 16:08	7439-97-6	
Dry Weight	Analytical Method: % Moisture							
Percent Moisture	**7.9**	%	0.10	1		07/22/11 00:00		
Sobek Acid Base Potential	Analytical Method: Modified Sobek 3.2							
Neutralization Potential	**6.1**	tons/1000	0.50	1		08/02/11 00:00		
Sobek Extractable Sulfur	Analytical Method: Modified Sobek 3.2							
Sulfur, HCl Extractable	**<0.050**	% (w/w)	0.050	1		08/02/11 08:16		
Sulfur, HNO3 Extractable	**0.134**	% (w/w)	0.050	1		08/02/11 08:16		
Sulfur, Hot Water Extractable	**0.237**	% (w/w)	0.050	1		08/02/11 08:16		
Sulfur, Residual	**<0.050**	% (w/w)	0.050	1		08/02/11 08:16		
Total Sulfur	**0.369**	% (w/w)	0.050	1		08/02/11 08:16		
Sobek Calculations	Analytical Method: Modified Sobek 3.2							
Acid/Base Potential	**1.6**	tons/1000		1		08/02/11 00:00		
Acid Potential	**4.4**	tons/1000	4.3	1		08/02/11 00:00		
Lime Requirement	**5.6**	tons/1000	5.4	1		08/02/11 00:00		
SMP Lime Requirement	**0**	tons/1000	0.0	1		08/02/11 00:00		
Sobek SMP Buffer pH	Analytical Method: Modified Sobek 3.2							
SMP Buffer pH	**7.4**	Std. Units	0.10	1		07/26/11 09:40		

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ANALYTICAL RESULTS

Project: Black Pine Mine REV
Pace Project No.: 10163633

Sample: BP-CMN-SS-05-00 **Lab ID: 10163633009** Collected: 07/14/11 10:10 Received: 07/14/11 21:00 Matrix: Solid

Results reported on a "dry-weight" basis

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
6020 MET ICPMS	Analytical Method: EPA 6020 Preparation Method: EPA 3050							
Antimony	**20.2**	mg/kg	0.45	20	08/01/11 15:37	08/03/11 17:15	7440-36-0	
Arsenic	**26.1**	mg/kg	0.45	20	08/01/11 15:37	08/03/11 17:15	7440-38-2	
Barium	**298**	mg/kg	0.27	20	08/01/11 15:37	08/03/11 17:15	7440-39-3	
Cadmium	**0.37**	mg/kg	0.072	20	08/01/11 15:37	08/03/11 17:15	7440-43-9	
Chromium	**4.8**	mg/kg	0.45	20	08/01/11 15:37	08/03/11 17:15	7440-47-3	
Cobalt	**6.1**	mg/kg	0.45	20	08/01/11 15:37	08/03/11 17:15	7440-48-4	
Copper	**73.6**	mg/kg	0.45	20	08/01/11 15:37	08/03/11 17:15	7440-50-8	
Iron	**8450**	mg/kg	44.8	20	08/01/11 15:37	08/03/11 17:15	7439-89-6	
Lead	**282**	mg/kg	0.090	20	08/01/11 15:37	08/03/11 17:15	7439-92-1	
Manganese	**928**	mg/kg	9.0	400	08/01/11 15:37	08/03/11 17:18	7439-96-5	
Nickel	**4.9**	mg/kg	0.45	20	08/01/11 15:37	08/03/11 17:15	7440-02-0	
Zinc	**88.0**	mg/kg	4.5	20	08/01/11 15:37	08/03/11 17:15	7440-66-6	
7471 Mercury	Analytical Method: EPA 7471 Preparation Method: EPA 7471							
Mercury	**<0.021**	mg/kg	0.021	1	07/28/11 19:18	08/01/11 16:11	7439-97-6	
Dry Weight	Analytical Method: % Moisture							
Percent Moisture	**11.5**	%	0.10	1		07/22/11 00:00		
Sobek Acid Base Potential	Analytical Method: Modified Sobek 3.2							
Neutralization Potential	**<0.5**	tons/1000	0.50	1		08/02/11 00:00		
Sobek Extractable Sulfur	Analytical Method: Modified Sobek 3.2							
Sulfur, HCl Extractable	**<0.050**	% (w/w)	0.050	1		08/02/11 08:54		
Sulfur, HNO3 Extractable	**<0.050**	% (w/w)	0.050	1		08/02/11 08:54		
Sulfur, Hot Water Extractable	**<0.050**	% (w/w)	0.050	1		08/02/11 08:54		
Sulfur, Residual	**<0.050**	% (w/w)	0.050	1		08/02/11 08:54		
Total Sulfur	**<0.050**	% (w/w)	0.050	1		08/02/11 08:54		
Sobek Calculations	Analytical Method: Modified Sobek 3.2							
Acid/Base Potential	**0**	tons/1000		1		08/02/11 00:00		
Acid Potential	**<4.3**	tons/1000	4.3	1		08/02/11 00:00		
Lime Requirement	**<5.4**	tons/1000	5.4	1		08/02/11 00:00		
SMP Lime Requirement	**0**	tons/1000	0.0	1		08/02/11 00:00		
Sobek SMP Buffer pH	Analytical Method: Modified Sobek 3.2							
SMP Buffer pH	**7.3**	Std. Units	0.10	1		07/26/11 09:40		

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ANALYTICAL RESULTS

Project: Black Pine Mine REV
Pace Project No.: 10163633

Sample: BP-CMN-SS-06-06 **Lab ID: 10163633010** Collected: 07/14/11 11:15 Received: 07/14/11 21:00 Matrix: Solid

Results reported on a "dry-weight" basis

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
6020 MET ICPMS	Analytical Method: EPA 6020 Preparation Method: EPA 3050							
Antimony	**2.1**	mg/kg	0.48	20	08/01/11 15:37	08/03/11 17:21	7440-36-0	
Arsenic	**7.0**	mg/kg	0.48	20	08/01/11 15:37	08/03/11 17:21	7440-38-2	
Barium	**67.9**	mg/kg	0.29	20	08/01/11 15:37	08/03/11 17:21	7440-39-3	
Cadmium	**0.25**	mg/kg	0.077	20	08/01/11 15:37	08/03/11 17:21	7440-43-9	
Chromium	**5.9**	mg/kg	0.48	20	08/01/11 15:37	08/03/11 17:21	7440-47-3	
Cobalt	**7.0**	mg/kg	0.48	20	08/01/11 15:37	08/03/11 17:21	7440-48-4	
Copper	**8.8**	mg/kg	0.48	20	08/01/11 15:37	08/03/11 17:21	7440-50-8	
Iron	**6890**	mg/kg	48.4	20	08/01/11 15:37	08/03/11 17:21	7439-89-6	
Lead	**19.0**	mg/kg	0.097	20	08/01/11 15:37	08/03/11 17:21	7439-92-1	
Manganese	**342**	mg/kg	0.48	20	08/01/11 15:37	08/03/11 17:21	7439-96-5	
Nickel	**8.0**	mg/kg	0.48	20	08/01/11 15:37	08/03/11 17:21	7440-02-0	
Zinc	**37.9**	mg/kg	4.8	20	08/01/11 15:37	08/03/11 17:21	7440-66-6	
7471 Mercury	Analytical Method: EPA 7471 Preparation Method: EPA 7471							
Mercury	**<0.020**	mg/kg	0.020	1	07/28/11 19:18	08/01/11 16:13	7439-97-6	
Dry Weight	Analytical Method: % Moisture							
Percent Moisture	**10.9**	%	0.10	1		07/22/11 00:00		

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ANALYTICAL RESULTS

Project: Black Pine Mine REV
Pace Project No.: 10163633

Sample: BP-CMN-RS-06-02 **Lab ID: 10163633011** Collected: 07/14/11 11:20 Received: 07/14/11 21:00 Matrix: Solid

Results reported on a "dry-weight" basis

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
6020 MET ICPMS	Analytical Method: EPA 6020 Preparation Method: EPA 3050							
Antimony	**765**	mg/kg	2.5	100	08/01/11 15:37	08/03/11 17:30	7440-36-0	M6
Arsenic	**515**	mg/kg	2.5	100	08/01/11 15:37	08/03/11 17:30	7440-38-2	M6
Barium	**168**	mg/kg	0.30	20	08/01/11 15:37	08/03/11 17:27	7440-39-3	M6
Cadmium	**14.9**	mg/kg	0.40	100	08/01/11 15:37	08/03/11 17:30	7440-43-9	M6
Chromium	**4.1**	mg/kg	2.5	100	08/01/11 15:37	08/03/11 17:30	7440-47-3	M6
Cobalt	**2.5**	mg/kg	0.50	20	08/01/11 15:37	08/03/11 17:27	7440-48-4	
Copper	**1690**	mg/kg	2.5	100	08/01/11 15:37	08/03/11 17:30	7440-50-8	M6
Iron	**14400**	mg/kg	248	100	08/01/11 15:37	08/03/11 17:30	7439-89-6	M6
Lead	**3820**	mg/kg	2.0	400	08/01/11 15:37	08/04/11 13:45	7439-92-1	M6
Manganese	**652**	mg/kg	2.5	100	08/01/11 15:37	08/03/11 17:30	7439-96-5	M6
Nickel	**3.9**	mg/kg	2.5	100	08/01/11 15:37	08/03/11 17:30	7440-02-0	M6
Zinc	**1150**	mg/kg	24.8	100	08/01/11 15:37	08/03/11 17:30	7440-66-6	M6
7471 Mercury	Analytical Method: EPA 7471 Preparation Method: EPA 7471							
Mercury	**0.26**	mg/kg	0.020	1	07/28/11 19:18	08/01/11 16:19	7439-97-6	
Dry Weight	Analytical Method: % Moisture							
Percent Moisture	**7.5**	%	0.10	1		07/22/11 00:00		
Sobek Acid Base Potential	Analytical Method: Modified Sobek 3.2							
Neutralization Potential	**11**	tons/1000	0.50	1		08/02/11 00:00		
Sobek Extractable Sulfur	Analytical Method: Modified Sobek 3.2							
Sulfur, HCl Extractable	**0.0778**	% (w/w)	0.050	1		08/02/11 09:06		
Sulfur, HNO3 Extractable	**0.144**	% (w/w)	0.050	1		08/02/11 09:06		
Sulfur, Hot Water Extractable	**0.169**	% (w/w)	0.050	1		08/02/11 09:06		
Sulfur, Residual	**<0.050**	% (w/w)	0.050	1		08/02/11 09:06		
Total Sulfur	**0.396**	% (w/w)	0.050	1		08/02/11 09:06		
Sobek Calculations	Analytical Method: Modified Sobek 3.2							
Acid/Base Potential	**4.2**	tons/1000		1		08/02/11 00:00		
Acid Potential	**6.5**	tons/1000	4.3	1		08/02/11 00:00		
Lime Requirement	**8.1**	tons/1000	5.4	1		08/02/11 00:00		
SMP Lime Requirement	**0**	tons/1000	0.0	1		08/02/11 00:00		
Sobek SMP Buffer pH	Analytical Method: Modified Sobek 3.2							
SMP Buffer pH	**7.4**	Std. Units	0.10	1		07/26/11 09:40		

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ANALYTICAL RESULTS

Project: Black Pine Mine REV
Pace Project No.: 10163633

Sample: BP-CMN-RS-06-00 **Lab ID: 10163633012** Collected: 07/14/11 11:25 Received: 07/14/11 21:00 Matrix: Solid

Results reported on a "dry-weight" basis

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
6020 MET ICPMS	Analytical Method: EPA 6020 Preparation Method: EPA 3050							
Antimony	**15.4**	mg/kg	0.44	20	08/01/11 15:37	08/03/11 17:34	7440-36-0	
Arsenic	**22.3**	mg/kg	8.7	400	08/01/11 15:37	08/03/11 17:37	7440-38-2	
Barium	**177**	mg/kg	0.26	20	08/01/11 15:37	08/03/11 17:34	7440-39-3	
Cadmium	**0.54**	mg/kg	0.070	20	08/01/11 15:37	08/03/11 17:34	7440-43-9	
Chromium	**4.1**	mg/kg	0.44	20	08/01/11 15:37	08/03/11 17:34	7440-47-3	
Cobalt	**7.8**	mg/kg	0.44	20	08/01/11 15:37	08/03/11 17:34	7440-48-4	
Copper	**57.5**	mg/kg	8.7	400	08/01/11 15:37	08/03/11 17:37	7440-50-8	
Iron	**6670**	mg/kg	43.7	20	08/01/11 15:37	08/03/11 17:34	7439-89-6	
Lead	**217**	mg/kg	0.087	20	08/01/11 15:37	08/03/11 17:34	7439-92-1	
Manganese	**910**	mg/kg	8.7	400	08/01/11 15:37	08/03/11 17:37	7439-96-5	
Nickel	**<8.7**	mg/kg	8.7	400	08/01/11 15:37	08/03/11 17:37	7440-02-0	
Zinc	**321**	mg/kg	87.5	400	08/01/11 15:37	08/03/11 17:37	7440-66-6	
7471 Mercury	Analytical Method: EPA 7471 Preparation Method: EPA 7471							
Mercury	**<0.022**	mg/kg	0.022	1	07/28/11 19:18	08/01/11 16:21	7439-97-6	
Dry Weight	Analytical Method: % Moisture							
Percent Moisture	**10.7**	%	0.10	1		07/22/11 00:00		
Sobek Acid Base Potential	Analytical Method: Modified Sobek 3.2							
Neutralization Potential	**0.94**	tons/1000	0.50	1		08/02/11 00:00		
Sobek Extractable Sulfur	Analytical Method: Modified Sobek 3.2							
Sulfur, HCl Extractable	**<0.050**	% (w/w)	0.050	1		08/02/11 09:20		
Sulfur, HNO3 Extractable	**<0.050**	% (w/w)	0.050	1		08/02/11 09:20		
Sulfur, Hot Water Extractable	**<0.050**	% (w/w)	0.050	1		08/02/11 09:20		
Sulfur, Residual	**<0.050**	% (w/w)	0.050	1		08/02/11 09:20		
Total Sulfur	**<0.050**	% (w/w)	0.050	1		08/02/11 09:20		
Sobek Calculations	Analytical Method: Modified Sobek 3.2							
Acid/Base Potential	**0.9**	tons/1000		1		08/02/11 00:00		
Acid Potential	**<4.3**	tons/1000	4.3	1		08/02/11 00:00		
Lime Requirement	**<5.4**	tons/1000	5.4	1		08/02/11 00:00		
SMP Lime Requirement	**0**	tons/1000	0.0	1		08/02/11 00:00		
Sobek SMP Buffer pH	Analytical Method: Modified Sobek 3.2							
SMP Buffer pH	**7.3**	Std. Units	0.10	1		07/26/11 09:40		

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QUALITY CONTROL DATA

Project: Black Pine Mine REV
Pace Project No.: 10163633

QC Batch: MPRP/27166 Analysis Method: EPA 6020
QC Batch Method: EPA 3050 Analysis Description: 6020 MET
Associated Lab Samples: 10163633001, 10163633002, 10163633003, 10163633004, 10163633005, 10163633006, 10163633007, 10163633008, 10163633009, 10163633010, 10163633011, 10163633012

METHOD BLANK: 1014848 Matrix: Solid
Associated Lab Samples: 10163633001, 10163633002, 10163633003, 10163633004, 10163633005, 10163633006, 10163633007, 10163633008, 10163633009, 10163633010, 10163633011, 10163633012

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Antimony	mg/kg	<0.50	0.50	08/03/11 15:51	
Arsenic	mg/kg	<0.50	0.50	08/03/11 15:51	
Barium	mg/kg	<0.30	0.30	08/03/11 15:51	
Cadmium	mg/kg	<0.080	0.080	08/03/11 15:51	
Chromium	mg/kg	<0.50	0.50	08/03/11 15:51	
Cobalt	mg/kg	<0.50	0.50	08/03/11 15:51	
Copper	mg/kg	<0.50	0.50	08/03/11 15:51	
Iron	mg/kg	<50.0	50.0	08/03/11 15:51	
Lead	mg/kg	<0.10	0.10	08/03/11 15:51	
Manganese	mg/kg	<0.50	0.50	08/03/11 15:51	
Nickel	mg/kg	<0.50	0.50	08/03/11 15:51	
Zinc	mg/kg	<5.0	5.0	08/03/11 15:51	

LABORATORY CONTROL SAMPLE: 1014849

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Antimony	mg/kg	19.6	22.5	115	75-125	
Arsenic	mg/kg	19.6	22.1	112	75-125	
Barium	mg/kg	19.6	22.6	115	75-125	
Cadmium	mg/kg	19.6	22.2	113	75-125	
Chromium	mg/kg	19.6	22.5	115	75-125	
Cobalt	mg/kg	19.6	24.0	123	75-125	
Copper	mg/kg	19.6	23.8	121	75-125	
Iron	mg/kg	245	285	116	75-125	
Lead	mg/kg	19.6	22.5	115	75-125	
Manganese	mg/kg	19.6	23.3	119	75-125	
Nickel	mg/kg	19.6	24.2	123	75-125	
Zinc	mg/kg	19.6	21.6	110	75-125	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 1014850 1014851

Parameter	Units	10163633001 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Antimony	mg/kg	1380	21.8	22	1430	1420	262	211	75-125	.7	20	M6
Arsenic	mg/kg	1380	21.8	22	1280	1150	-425	-1040	75-125	11	20	M6
Barium	mg/kg	247	21.8	22	281	258	157	49	75-125	9	20	M6
Cadmium	mg/kg	20.6	21.8	22	68.3	69.0	219	220	75-125	1	20	M6
Chromium	mg/kg	2.7	21.8	22	55.3	54.0	241	233	75-125	2	20	M6

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QUALITY CONTROL DATA

Project: Black Pine Mine REV
Pace Project No.: 10163633

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 1014850 1014851

Parameter	Units	10163633001 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Cobalt	mg/kg	1.1	21.8	22	50.3	50.0	226	222	75-125	.6	20	
Copper	mg/kg	1280	21.8	22	1160	1200	-545	-356	75-125	3	20	M6
Iron	mg/kg	23100	273	275	21700	20600	-513	-892	75-125	5	20	M6
Lead	mg/kg	6960	21.8	22	6940	7420	-79	2100	75-125	7	20	M6
Manganese	mg/kg	270	21.8	22	332	246	283	-111	75-125	30	20	D6,M6
Nickel	mg/kg	<2.8	21.8	22	50.8	51.5	225	226	75-125	1	20	M6
Zinc	mg/kg	332	21.8	22	432	364	460	145	75-125	17	20	M6

MATRIX SPIKE SAMPLE: 1014852

Parameter	Units	10163633011 Result	Spike Conc.	MS Result	MS % Rec	% Rec Limits	Qualifiers
Antimony	mg/kg	765	19.8	907	714	75-125	M6
Arsenic	mg/kg	515	19.8	2180	8400	75-125	M6
Barium	mg/kg	168	19.8	214	232	75-125	M6
Cadmium	mg/kg	14.9	19.8	63.6	246	75-125	M6
Chromium	mg/kg	4.1	19.8	52.7	245	75-125	M6
Cobalt	mg/kg	2.5	19.8	50.1	240	75-125	
Copper	mg/kg	1690	19.8	1970	1410	75-125	M6
Iron	mg/kg	14400	247	15900	623	75-125	M6
Lead	mg/kg	3820	19.8	7060	16400	75-125	M6
Manganese	mg/kg	652	19.8	586	-333	75-125	M6
Nickel	mg/kg	3.9	19.8	52.1	243	75-125	M6
Zinc	mg/kg	1150	19.8	1220	402	75-125	M6

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QUALITY CONTROL DATA

Project: Black Pine Mine REV
Pace Project No.: 10163633

QC Batch: MERP/5649 Analysis Method: EPA 7471
QC Batch Method: EPA 7471 Analysis Description: 7471 Mercury
Associated Lab Samples: 10163633001, 10163633002, 10163633003, 10163633004, 10163633005, 10163633006, 10163633007, 10163633008, 10163633009, 10163633010, 10163633011, 10163633012

METHOD BLANK: 1016602 Matrix: Solid
Associated Lab Samples: 10163633001, 10163633002, 10163633003, 10163633004, 10163633005, 10163633006, 10163633007, 10163633008, 10163633009, 10163633010, 10163633011, 10163633012

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Mercury	mg/kg	<0.018	0.018	08/01/11 15:23	

LABORATORY CONTROL SAMPLE: 1016603

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Mercury	mg/kg	.45	0.47	104	80-120	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 1016604 1016605

Parameter	Units	10163633001 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Mercury	mg/kg	7.0	.46	.51	5.2	5.7	-399	-259	80-120	9	20	M6

MATRIX SPIKE SAMPLE: 1016606

Parameter	Units	10163634008 Result	Spike Conc.	MS Result	MS % Rec	% Rec Limits	Qualifiers
Mercury	mg/kg	<0.021	.56	<0.022	3	80-120	M1

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QUALITY CONTROL DATA

Project: Black Pine Mine REV
Pace Project No.: 10163633

QC Batch: MPRP/27268 Analysis Method: % Moisture
QC Batch Method: % Moisture Analysis Description: Dry Weight/Percent Moisture
Associated Lab Samples: 10163633001, 10163633002, 10163633003, 10163633004, 10163633005, 10163633006, 10163633007

SAMPLE DUPLICATE: 1018184

Parameter	Units	10163610023 Result	Dup Result	RPD	Max RPD	Qualifiers
Percent Moisture	%	5.9	6.5	10	30	

SAMPLE DUPLICATE: 1018185

Parameter	Units	10163633007 Result	Dup Result	RPD	Max RPD	Qualifiers
Percent Moisture	%	11.8	10.1	15	30	

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QUALITY CONTROL DATA

Project: Black Pine Mine REV
Pace Project No.: 10163633

QC Batch: MPRP/27274 Analysis Method: % Moisture
QC Batch Method: % Moisture Analysis Description: Dry Weight/Percent Moisture
Associated Lab Samples: 10163633008, 10163633009, 10163633010, 10163633011, 10163633012

SAMPLE DUPLICATE: 1018328

Parameter	Units	10163633008 Result	Dup Result	RPD	Max RPD	Qualifiers
Percent Moisture	%	7.9	6.8	15	30	

SAMPLE DUPLICATE: 1018347

Parameter	Units	10163990001 Result	Dup Result	RPD	Max RPD	Qualifiers
Percent Moisture	%	10.6	10.3	3	30	

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QUALITY CONTROL DATA

Project: Black Pine Mine REV
Pace Project No.: 10163633

QC Batch: MT/6496 Analysis Method: Modified Sobek 3.2
QC Batch Method: Modified Sobek 3.2 Analysis Description: Sobek Acid Base Potential
Associated Lab Samples: 10163633001, 10163633002, 10163633003, 10163633008, 10163633009, 10163633011, 10163633012

METHOD BLANK: 1020547 Matrix: Solid
Associated Lab Samples: 10163633001, 10163633002, 10163633003, 10163633008, 10163633009, 10163633011, 10163633012

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Neutralization Potential	tons/1000	<0.5	0.50	08/02/11 00:00	

SAMPLE DUPLICATE: 1020546

Parameter	Units	10163635003 Result	Dup Result	RPD	Max RPD	Qualifiers
Neutralization Potential	tons/1000	<0.5	0.97			

SAMPLE DUPLICATE: 1020548

Parameter	Units	10163633009 Result	Dup Result	RPD	Max RPD	Qualifiers
Neutralization Potential	tons/1000	<0.5	6.5			

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QUALITY CONTROL DATA

Project: Black Pine Mine REV
Pace Project No.: 10163633

QC Batch: MT/6487 Analysis Method: Modified Sobek 3.2
QC Batch Method: Modified Sobek 3.2 Analysis Description: Sobek Extractable Sulfur
Associated Lab Samples: 10163633001, 10163633002, 10163633003, 10163633008, 10163633009, 10163633011, 10163633012

METHOD BLANK: 1019970 Matrix: Solid
Associated Lab Samples: 10163633001, 10163633002, 10163633003, 10163633008, 10163633009, 10163633011, 10163633012

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Total Sulfur	% (w/w)	<0.050	0.050	08/01/11 13:07	

SAMPLE DUPLICATE: 1019972

Parameter	Units	10163635003 Result	Dup Result	RPD	Max RPD	Qualifiers
Total Sulfur	% (w/w)	<0.050	<0.050			

SAMPLE DUPLICATE: 1019973

Parameter	Units	10163633008 Result	Dup Result	RPD	Max RPD	Qualifiers
Total Sulfur	% (w/w)	0.369	0.428	15		

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QUALITY CONTROL DATA

Project: Black Pine Mine REV
Pace Project No.: 10163633

QC Batch: MT/6542 Analysis Method: Modified Sobek 3.2
QC Batch Method: Modified Sobek 3.2 Analysis Description: Sobek SMP Buffer pH
Associated Lab Samples: 10163633001, 10163633002, 10163633003, 10163633008, 10163633009, 10163633011, 10163633012

SAMPLE DUPLICATE: 1022810

Parameter	Units	10163635003 Result	Dup Result	RPD	Max RPD	Qualifiers
SMP Buffer pH	Std. Units	6.4	6.4	.3	20	

SAMPLE DUPLICATE: 1026467

Parameter	Units	10163633008 Result	Dup Result	RPD	Max RPD	Qualifiers
SMP Buffer pH	Std. Units	7.4	7.4	.1	20	

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QUALIFIERS

Project: Black Pine Mine REV
Pace Project No.: 10163633

DEFINITIONS

DF - Dilution Factor, if reported, represents the factor applied to the reported data due to changes in sample preparation, dilution of the sample aliquot, or moisture content.

ND - Not Detected at or above adjusted reporting limit.

J - Estimated concentration above the adjusted method detection limit and below the adjusted reporting limit.

MDL - Adjusted Method Detection Limit.

S - Surrogate

1,2-Diphenylhydrazine (8270 listed analyte) decomposes to Azobenzene.

Consistent with EPA guidelines, unrounded data are displayed and have been used to calculate % recovery and RPD values.

LCS(D) - Laboratory Control Sample (Duplicate)

MS(D) - Matrix Spike (Duplicate)

DUP - Sample Duplicate

RPD - Relative Percent Difference

NC - Not Calculable.

SG - Silica Gel - Clean-Up

U - Indicates the compound was analyzed for, but not detected.

N-Nitrosodiphenylamine decomposes and cannot be separated from Diphenylamine using Method 8270. The result reported for each analyte is a combined concentration.

LABORATORIES

PASI-M	Pace Analytical Services - Minneapolis
PASI-MT	Pace Analytical Services - Montana

ANALYTE QUALIFIERS

D6	The relative percent difference (RPD) between the sample and sample duplicate exceeded laboratory control limits.
M1	Matrix spike recovery exceeded QC limits. Batch accepted based on laboratory control sample (LCS) recovery.
M6	Matrix spike and Matrix spike duplicate recovery not evaluated against control limits due to sample dilution.

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QUALITY CONTROL DATA CROSS REFERENCE TABLE

Project: Black Pine Mine REV
Pace Project No.: 10163633

Lab ID	Sample ID	QC Batch Method	QC Batch	Analytical Method	Analytical Batch
10163633001	**BP-HM-RS-07-01**	EPA 3050	MPRP/27166	EPA 6020	ICPM/11156
10163633002	**BP-HM-RS-06-01**	EPA 3050	MPRP/27166	EPA 6020	ICPM/11156
10163633003	**BP-HM-RS-05-02**	EPA 3050	MPRP/27166	EPA 6020	ICPM/11156
10163633004	**BP-HM-RS-05-05**	EPA 3050	MPRP/27166	EPA 6020	ICPM/11156
10163633005	**BP-HM-SS-07-03**	EPA 3050	MPRP/27166	EPA 6020	ICPM/11156
10163633006	**BP-HM-RS-06-08**	EPA 3050	MPRP/27166	EPA 6020	ICPM/11156
10163633007	**BP-CMN-SS-05-08**	EPA 3050	MPRP/27166	EPA 6020	ICPM/11156
10163633008	**BP-CMN-RS-05-05**	EPA 3050	MPRP/27166	EPA 6020	ICPM/11156
10163633009	**BP-CMN-SS-05-00**	EPA 3050	MPRP/27166	EPA 6020	ICPM/11156
10163633010	**BP-CMN-SS-06-06**	EPA 3050	MPRP/27166	EPA 6020	ICPM/11156
10163633011	**BP-CMN-RS-06-02**	EPA 3050	MPRP/27166	EPA 6020	ICPM/11156
10163633012	**BP-CMN-RS-06-00**	EPA 3050	MPRP/27166	EPA 6020	ICPM/11156
10163633001	**BP-HM-RS-07-01**	EPA 7471	MERP/5649	EPA 7471	MERC/6495
10163633002	**BP-HM-RS-06-01**	EPA 7471	MERP/5649	EPA 7471	MERC/6495
10163633003	**BP-HM-RS-05-02**	EPA 7471	MERP/5649	EPA 7471	MERC/6495
10163633004	**BP-HM-RS-05-05**	EPA 7471	MERP/5649	EPA 7471	MERC/6495
10163633005	**BP-HM-SS-07-03**	EPA 7471	MERP/5649	EPA 7471	MERC/6495
10163633006	**BP-HM-RS-06-08**	EPA 7471	MERP/5649	EPA 7471	MERC/6495
10163633007	**BP-CMN-SS-05-08**	EPA 7471	MERP/5649	EPA 7471	MERC/6495
10163633008	**BP-CMN-RS-05-05**	EPA 7471	MERP/5649	EPA 7471	MERC/6495
10163633009	**BP-CMN-SS-05-00**	EPA 7471	MERP/5649	EPA 7471	MERC/6495
10163633010	**BP-CMN-SS-06-06**	EPA 7471	MERP/5649	EPA 7471	MERC/6495
10163633011	**BP-CMN-RS-06-02**	EPA 7471	MERP/5649	EPA 7471	MERC/6495
10163633012	**BP-CMN-RS-06-00**	EPA 7471	MERP/5649	EPA 7471	MERC/6495
10163633001	**BP-HM-RS-07-01**	% Moisture	MPRP/27268		
10163633002	**BP-HM-RS-06-01**	% Moisture	MPRP/27268		
10163633003	**BP-HM-RS-05-02**	% Moisture	MPRP/27268		
10163633004	**BP-HM-RS-05-05**	% Moisture	MPRP/27268		
10163633005	**BP-HM-SS-07-03**	% Moisture	MPRP/27268		
10163633006	**BP-HM-RS-06-08**	% Moisture	MPRP/27268		
10163633007	**BP-CMN-SS-05-08**	% Moisture	MPRP/27268		
10163633008	**BP-CMN-RS-05-05**	% Moisture	MPRP/27274		
10163633009	**BP-CMN-SS-05-00**	% Moisture	MPRP/27274		
10163633010	**BP-CMN-SS-06-06**	% Moisture	MPRP/27274		
10163633011	**BP-CMN-RS-06-02**	% Moisture	MPRP/27274		
10163633012	**BP-CMN-RS-06-00**	% Moisture	MPRP/27274		
10163633001	**BP-HM-RS-07-01**	Modified Sobek 3.2	MT/6496		
10163633002	**BP-HM-RS-06-01**	Modified Sobek 3.2	MT/6496		
10163633003	**BP-HM-RS-05-02**	Modified Sobek 3.2	MT/6496		
10163633008	**BP-CMN-RS-05-05**	Modified Sobek 3.2	MT/6496		
10163633009	**BP-CMN-SS-05-00**	Modified Sobek 3.2	MT/6496		
10163633011	**BP-CMN-RS-06-02**	Modified Sobek 3.2	MT/6496		
10163633012	**BP-CMN-RS-06-00**	Modified Sobek 3.2	MT/6496		
10163633001	**BP-HM-RS-07-01**	Modified Sobek 3.2	MT/6487		
10163633002	**BP-HM-RS-06-01**	Modified Sobek 3.2	MT/6487		
10163633003	**BP-HM-RS-05-02**	Modified Sobek 3.2	MT/6487		

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QUALITY CONTROL DATA CROSS REFERENCE TABLE

Project: Black Pine Mine REV
Pace Project No.: 10163633

Lab ID	Sample ID	QC Batch Method	QC Batch	Analytical Method	Analytical Batch
10163633008	**BP-CMN-RS-05-05**	Modified Sobek 3.2	MT/6487		
10163633009	**BP-CMN-SS-05-00**	Modified Sobek 3.2	MT/6487		
10163633011	**BP-CMN-RS-06-02**	Modified Sobek 3.2	MT/6487		
10163633012	**BP-CMN-RS-06-00**	Modified Sobek 3.2	MT/6487		
10163633001	**BP-HM-RS-07-01**	Modified Sobek 3.2	MT/6500		
10163633002	**BP-HM-RS-06-01**	Modified Sobek 3.2	MT/6500		
10163633003	**BP-HM-RS-05-02**	Modified Sobek 3.2	MT/6500		
10163633008	**BP-CMN-RS-05-05**	Modified Sobek 3.2	MT/6500		
10163633009	**BP-CMN-SS-05-00**	Modified Sobek 3.2	MT/6500		
10163633011	**BP-CMN-RS-06-02**	Modified Sobek 3.2	MT/6500		
10163633012	**BP-CMN-RS-06-00**	Modified Sobek 3.2	MT/6500		
10163633001	**BP-HM-RS-07-01**	Modified Sobek 3.2	MT/6542		
10163633002	**BP-HM-RS-06-01**	Modified Sobek 3.2	MT/6542		
10163633003	**BP-HM-RS-05-02**	Modified Sobek 3.2	MT/6542		
10163633008	**BP-CMN-RS-05-05**	Modified Sobek 3.2	MT/6542		
10163633009	**BP-CMN-SS-05-00**	Modified Sobek 3.2	MT/6542		
10163633011	**BP-CMN-RS-06-02**	Modified Sobek 3.2	MT/6542		
10163633012	**BP-CMN-RS-06-00**	Modified Sobek 3.2	MT/6542		

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CHAIN-OF-CUSTODY / Analytical Request Document

The Chain-of-Custody is a LEGAL DOCUMENT. All relevant fields must be completed accurately.

Page: 1 of 1

1429989

Section A Required Client Information:

Company: HERRERA
Address:
Email To: KHOUCK@HERRERAINC.COM
Phone: Fax:
Requested Due Date/TAT:

Section B Required Project Information:

Report To: KEVIN HOUCK
Copy To:
Purchase Order No.:
Project Name: BLACK PINE MINE
Project Number:

Section C Invoice Information:

Attention:
Company Name: DEQ
Address:
Pace Quote Reference:
Pace Project Manager:
Pace Profile #:

REGULATORY AGENCY

☐ NPDES ☐ GROUND WATER ☐ DRINKING WATER
☐ UST ☐ RCRA ☐ OTHER

Site Location STATE:

Requested Analysis Filtered (Y/N)

Section D Required Client Information

SAMPLE ID
(A-Z, 0-9 / ,-)
Sample IDs MUST BE UNIQUE

Matrix Codes (MATRIX / CODE)
Drinking Water DW
Water WT
Waste Water WW
Product P
Soil/Solid SL
Oil OL
Wipe WP
Air AR
Tissue TS
Other OT

ITEM #	SAMPLE ID	MATRIX CODE (see valid codes to left)	SAMPLE TYPE (G=GRAB C=COMP)	COLLECTED COMPOSITE START DATE	COMPOSITE START TIME	COMPOSITE END/GRAB DATE	COMPOSITE END/GRAB TIME	SAMPLE TEMP AT COLLECTION	# OF CONTAINERS	Preservatives: Unpreserved	H_2SO_4	HNO_3	HCl	NaOH	$Na_2S_2O_3$	Methanol	Other	Analysis Test Y/N	TOTAL REC. METALS	ABA	MERCURY ANALYSIS	MOISTURE CONTENT	Residual Chlorine (Y/N)	TOTAL RECOVERABLE METALS = SB, AS, BA, CD, CR, CO, FE, PB, MN, HG, NI, ZN 10163633 Pace Project No./ Lab I.D.
1	BP-HM-RS-07-01	SL	C			7/13/11	1520		2	X									X	X				001
2	BP-HM-RS-06-01	SL	C			7/13/11	1550		2	X									X	X				002
3	BP-HM-RS-05-02	SL	C			7/13/11	1620		2	X									X	X				003
4	BP-HM-RS-05-05	SL	G			7/13/11	1615		1	X									X					004
5	BP-HM-SS-07-03	SL	G			7/13/11	1527		1	X									X					005
6	BP-HM-RS-06-02	SL	G			7/13/11	1610		1	X									X					006
7	BP-CMN-SS-05-08	SL	G			7/14/11	1000		1	X									X					007
8	BP-CMN-RS-05-05	SL	G			7/14/11	1005		2	X									X	X		X		008
9	BP-CMN-SS-05-00	SL	G			7/14/11	1010		2	X									X	X		X		009
10	BP-CMN-SS-06-06	SL	G			7/14/11	1115		1	X									X					010
11	BP-CMN-RS-06-02	SL	C			7/14/11	1120		2	X									X	X		X		011
12	BP-CMN-SS-06-00	SL	C			7/14/11	1125		2	X									X	X		X		012

ADDITIONAL COMMENTS	RELINQUISHED BY / AFFILIATION	DATE	TIME	ACCEPTED BY / AFFILIATION	DATE	TIME	SAMPLE CONDITIONS
	W.D Acton/Herrera	7/14/11	1540		7/14/11	3:44	
		7/14/11	9:00	Nonna C. Hamblet/Pace	7/14/11	2100	
							3.6 / Y / N / Y

Temp in °C | Received on Ice (Y/N) | Custody Sealed Cooler (Y/N) | Samples Intact (Y/N)

ORIGINAL

SAMPLER NAME AND SIGNATURE
PRINT Name of SAMPLER:
SIGNATURE of SAMPLER: DATE Signed (MM/DD/YY):

*Important Note: By signing this form you are accepting Pace's NET 30 day payment terms and agreeing to late charges of 1.5% per month for any invoices not paid within 30 days.

F-ALL-Q-020rev.07, 15-May-2007

Sample Condition Upon Receipt

Pace Analytical

Client Name: MDEQ BPM Project # 10163633

Courier: ☐ Fed Ex ☐ UPS ☐ USPS ☐ Client ☐ Commercial ☒ Pace Other _____

Tracking #: Blaine drop off

Custody Seal on Cooler/Box Present: ☐ yes ☒ no Seals intact: ☐ yes ☒ no

Packing Material: ☐ Bubble Wrap ☒ Bubble Bags ☐ None ☐ Other _____ Temp Blank: Yes _____ No X

Thermometer Used 1383045 or 135 Type of Ice: (Wet) Blue None ☒ Samples on ice, cooling process has begun

Cooler Temperature 3.1o Biological Tissue is Frozen: Yes No

Temp should be above freezing to 6°C

Date and Initials of person examining contents: KW 7/16/14

		Comments:
Chain of Custody Present:	☒Yes ☐No ☐N/A	1.
Chain of Custody Filled Out:	☒Yes ☐No ☐N/A	2.
Chain of Custody Relinquished:	☒Yes ☐No ☐N/A	3.
Sampler Name & Signature on COC:	☐Yes ☒No ☐N/A	4.
Samples Arrived within Hold Time:	☒Yes ☐No ☐N/A	5.
Short Hold Time Analysis (<72hr):	☐Yes ☒No ☐N/A	6.
Rush Turn Around Time Requested:	☐Yes ☒No ☐N/A	7.
Sufficient Volume:	☒Yes ☐No ☐N/A	8.
Correct Containers Used:	☒Yes ☐No ☐N/A	9. PB
-Pace Containers Used:	☒Yes ☐No ☐N/A	
Containers Intact:	☒Yes ☐No ☐N/A	10.
Filtered volume received for Dissolved tests	☐Yes ☐No ☒N/A	11.
Sample Labels match COC:	☒Yes ☐No ☐N/A	12.
-Includes date/time/ID/Analysis Matrix: SL		
All containers needing acid/base preservation have been checked. Noncompliance are noted in 13.	☐Yes ☐No ☒N/A	13. ☐ HNO3 ☐ H2SO4 ☐ NaOH ☐ HCl Samp #
All containers needing preservation are found to be in compliance with EPA recommendation.	☐Yes ☐No ☒N/A	
Exceptions: VOA,Coliform, TOC, Oil and Grease, WI-DRO (water)	☐Yes ☒No	Initial when completed / Lot # of added preservative
Samples checked for dechlorination:	☐Yes ☐No ☒N/A	14.
Headspace in VOA Vials (>6mm):	☐Yes ☐No ☒N/A	15.
Trip Blank Present:	☐Yes ☒No ☐N/A	16.
Trip Blank Custody Seals Present	☐Yes ☐No ☒N/A	
Pace Trip Blank Lot # (if purchased): N/A		

Client Notification/ Resolution: Field Data Required? Y / N

Person Contacted: _____ Date/Time: _____

Comments/ Resolution: _____

Project Manager Review: _____ **Date:** 7/16/14

Note: Whenever there is a discrepancy affecting North Carolina compliance samples, a copy of this form will be sent to the North Carolina DEHNR Certification Office (i.e out of hold, incorrect preservative, out of temp, incorrect containers)

Pace Analytical Services, Inc.
602 S 25th Street
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(406)254-7226

October 18, 2011

Kevin Houck
Herrera Environmental Consultants
101 East Broadway, Suite 610
Missoula, MT 59802

RE: Project: Black Pine Mine REV
Pace Project No.: 10163634

Dear Kevin Houck:
Enclosed are the analytical results for sample(s) received by the laboratory on July 16, 2011. The results relate only to the samples included in this report.

This report has been revised to add Cobalt and delete Silver.

If you have any questions concerning this report, please feel free to contact me.

Sincerely,

Shawn Davis for
Sally Heinje
sally.heinje@pacelabs.com
Project Manager

Enclosures

cc: Devin Clary, Montana Dept. of Environmental Quality
Mark Donner, Trihydro
Jamie Mongoven, Montana Dept. of Environmental

REPORT OF LABORATORY ANALYSIS

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CERTIFICATIONS

Project: Black Pine Mine REV
Pace Project No.: 10163634

Minnesota Certification IDs

1700 Elm Street SE Suite 200, Minneapolis, MN 55414
A2LA Certification #: 2926.01
Alaska Certification #: UST-078
Alaska Certification #MN00064
Arizona Certification #: AZ-0014
Arkansas Certification #: 88-0680
California Certification #: 01155CA
EPA Region 8 Certification #: Pace
Florida/NELAP Certification #: E87605
Georgia Certification #: 959
Idaho Certification #: MN00064
Illinois Certification #: 200011
Iowa Certification #: 368
Kansas Certification #: E-10167
Louisiana Certification #: 03086
Louisiana Certification #: LA080009
Maine Certification #: 2007029
Maryland Certification #: 322
Michigan DEQ Certification #: 9909
Minnesota Certification #: 027-053-137
Mississippi Certification #: Pace
Montana Certification #: MT CERT0092
Nebraska Certification #: Pace
Nevada Certification #: MN_00064
New Jersey Certification #: MN-002
New Mexico Certification #: Pace
New York Certification #: 11647
North Carolina Certification #: 530
North Dakota Certification #: R-036
North Dakota Certification #: R-036A
Ohio VAP Certification #: CL101
Oklahoma Certification #: D9921
Oklahoma Certification #: 9507
Oregon Certification #: MN200001
Pennsylvania Certification #: 68-00563
Puerto Rico Certification
Tennessee Certification #: 02818
Texas Certification #: T104704192
Washington Certification #: C754
Wisconsin Certification #: 999407970

Montana Certification IDs

602 South 25th Street, Billings, MT 59101
EPA Region 8 Certification #: 8TMS-Q
Idaho Certification #: MT00012
Montana Certification #: MT CERT0040
NVLAP Certification #: 101292-0
Minnesota Dept of Health Certification #: 030-999-442

Kansas Certification IDs

9608 Loiret Boulevard, Lenexa, KS 66219
A2LA Certification #: 2456.01
Arkansas Certification #: 05-008-0
Illinois Certification #: 001191
Iowa Certification #: 118
Kansas/NELAP Certification #: E-10116
Louisiana Certification #: 03055
Nevada Certification #: KS000212008A
Oklahoma Certification #: 9205/9935
Texas Certification #: T104704407-08-TX
Utah Certification #: 9135995665

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SAMPLE SUMMARY

Project: Black Pine Mine REV
Pace Project No.: 10163634

Lab ID	Sample ID	Matrix	Date Collected	Date Received
10163634001	**BP-CMN-SS-04-00**	Solid	07/14/11 12:45	07/16/11 20:03
10163634002	**BP-CMN-RS-04-02**	Solid	07/14/11 12:35	07/16/11 20:03
10163634003	**BP-CMN-RS-04-05**	Solid	07/14/11 12:40	07/16/11 20:03
10163634004	**BP-CMN-SS-04-08**	Solid	07/14/11 12:30	07/16/11 20:03
10163634005	**BP-CMN-SS-07-00**	Solid	07/14/11 12:35	07/16/11 20:03
10163634006	**BP-CMN-SS-07-06**	Solid	07/14/11 13:40	07/16/11 20:03
10163634007	**BP-CMN-SS-08-00**	Solid	07/14/11 14:05	07/16/11 20:03
10163634008	**BP-CMN-SS-08-03**	Solid	07/14/11 14:10	07/16/11 20:03
10163634009	**BP-CMN-SS-09-00**	Solid	07/14/11 14:30	07/16/11 20:03
10163634010	**BP-CMN-SS-09-04**	Solid	07/14/11 14:45	07/16/11 20:03

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SAMPLE ANALYTE COUNT

Project: Black Pine Mine REV
Pace Project No.: 10163634

Lab ID	Sample ID	Method	Analysts	Analytes Reported	Laboratory
10163634001	**BP-CMN-SS-04-00**	EPA 6020	RJS	12	PASI-M
		EPA 7471	TEM	1	PASI-M
		% Moisture	JDL	1	PASI-M
		Modified Sobek 3.2	JH1	1	PASI-MT
		Modified Sobek 3.2	JH1	5	PASI-MT
		Modified Sobek 3.2	JH1	4	PASI-MT
		Modified Sobek 3.2	JH1	1	PASI-MT
10163634002	**BP-CMN-RS-04-02**	EPA 6020	RJS	12	PASI-M
		EPA 7471	TEM	1	PASI-M
		% Moisture	JDL	1	PASI-M
		Modified Sobek 3.2	JH1	1	PASI-MT
		Modified Sobek 3.2	JH1	5	PASI-MT
		Modified Sobek 3.2	JH1	4	PASI-MT
		Modified Sobek 3.2	JH1	1	PASI-MT
10163634003	**BP-CMN-RS-04-05**	EPA 6020	RJS	12	PASI-M
		EPA 7471	TEM	1	PASI-M
		% Moisture	JDL	1	PASI-M
		Modified Sobek 3.2	JH1	1	PASI-MT
		Modified Sobek 3.2	JH1	5	PASI-MT
		Modified Sobek 3.2	JH1	4	PASI-MT
		Modified Sobek 3.2	JH1	1	PASI-MT
10163634004	**BP-CMN-SS-04-08**	EPA 6020	RJS	12	PASI-M
		EPA 7471	TEM	1	PASI-M
		% Moisture	JDL	1	PASI-M
10163634005	**BP-CMN-SS-07-00**	EPA 6020	RJS	12	PASI-M
		EPA 7471	TEM	1	PASI-M
		% Moisture	JDL	1	PASI-M
		Modified Sobek 3.2	JH1	1	PASI-MT
		Modified Sobek 3.2	JH1	5	PASI-MT
		Modified Sobek 3.2	JH1	4	PASI-MT
		Modified Sobek 3.2	JH1	1	PASI-MT
10163634006	**BP-CMN-SS-07-06**	CLPICPAES	IP	1	PASI-M
		EPA 9081	SMW	1	PASI-K
		EPA 6020	RJS	12	PASI-M
		EPA 7471	TEM	1	PASI-M
		% Moisture	JDL	1	PASI-M
		ASA 33-3.2/EPA 353.2	CAC	1	PASI-MT

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SAMPLE ANALYTE COUNT

Project: Black Pine Mine REV
Pace Project No.: 10163634

Lab ID	Sample ID	Method	Analysts	Analytes Reported	Laboratory
		ASTM D421	CAC	1	PASI-MT
		ASA 29-3.5.2	CAC	1	PASI-MT
		ASA 10-3.2	CAC	1	PASI-MT
		ASA 24-5.4/SM4500	SA1	1	PASI-MT
		Modified Sobek 3.2	JH1	1	PASI-MT
		Modified Sobek 3.2	JH1	5	PASI-MT
		Modified Sobek 3.2	JH1	4	PASI-MT
		Modified Sobek 3.2	JH1	1	PASI-MT
10163634007	**BP-CMN-SS-08-00**	EPA 6020	RJS	12	PASI-M
		EPA 7471	TEM	1	PASI-M
		% Moisture	JDL	1	PASI-M
		Modified Sobek 3.2	JH1	1	PASI-MT
		Modified Sobek 3.2	JH1	5	PASI-MT
		Modified Sobek 3.2	JH1	4	PASI-MT
		Modified Sobek 3.2	JH1	1	PASI-MT
10163634008	**BP-CMN-SS-08-03**	CLPICPAES	IP	1	PASI-M
		EPA 9081	SMW	1	PASI-K
		EPA 6020	RJS	12	PASI-M
		EPA 7471	TEM	1	PASI-M
		% Moisture	JDL	1	PASI-M
		ASA 33-3.2/EPA 353.2	CAC	1	PASI-MT
		ASTM D421	CAC	1	PASI-MT
		ASA 29-3.5.2	CAC	1	PASI-MT
		ASA 10-3.2	CAC	1	PASI-MT
		ASA 24-5.4/SM4500	SA1	1	PASI-MT
		Modified Sobek 3.2	JH1	1	PASI-MT
		Modified Sobek 3.2	JH1	5	PASI-MT
		Modified Sobek 3.2	JH1	4	PASI-MT
		Modified Sobek 3.2	JH1	1	PASI-MT
		ASA 10-3.3	SR1	1	PASI-MT
10163634009	**BP-CMN-SS-09-00**	EPA 6020	RJS	12	PASI-M
		EPA 7471	TEM	1	PASI-M
		% Moisture	JDL	1	PASI-M
		Modified Sobek 3.2	JH1	1	PASI-MT
		Modified Sobek 3.2	JH1	5	PASI-MT
		Modified Sobek 3.2	JH1	4	PASI-MT
		Modified Sobek 3.2	JH1	1	PASI-MT

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SAMPLE ANALYTE COUNT

Project: Black Pine Mine REV
Pace Project No.: 10163634

Lab ID	Sample ID	Method	Analysts	Analytes Reported	Laboratory
10163634010	**BP-CMN-SS-09-04**	CLPICPAES	IP	1	PASI-M
		EPA 9081	SMW	1	PASI-K
		EPA 6020	RJS	12	PASI-M
		EPA 7471	TEM	1	PASI-M
		% Moisture	JDL	1	PASI-M
		ASA 33-3.2/EPA 353.2	CAC	1	PASI-MT
		ASTM D421	CAC	1	PASI-MT
		ASA 29-3.5.2	CAC	1	PASI-MT
		ASA 10-3.2	CAC	1	PASI-MT
		ASA 24-5.4/SM4500	SA1	1	PASI-MT
		Modified Sobek 3.2	JH1	1	PASI-MT
		Modified Sobek 3.2	JH1	5	PASI-MT
		Modified Sobek 3.2	JH1	4	PASI-MT
		Modified Sobek 3.2	JH1	1	PASI-MT
		ASA 10-3.3	SR1	1	PASI-MT

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PROJECT NARRATIVE

Project: Black Pine Mine REV
Pace Project No.: 10163634

Method: **CLPICPAES**
Description: 6010 MET ICP, MDEQ Potassium
Client: Montana Dept. of Environmental Quality
Date: October 18, 2011

General Information:
3 samples were analyzed for CLPICPAES. All samples were received in acceptable condition with any exceptions noted below.

Hold Time:
The samples were analyzed within the method required hold times with any exceptions noted below.

Sample Preparation:
The samples were prepared in accordance with ASA 13-3.5.2.2 with any exceptions noted below.

Initial Calibrations (including MS Tune as applicable):
All criteria were within method requirements with any exceptions noted below.

Continuing Calibration:
All criteria were within method requirements with any exceptions noted below.

Method Blank:
All analytes were below the report limit in the method blank with any exceptions noted below.

Laboratory Control Spike:
All laboratory control spike compounds were within QC limits with any exceptions noted below.

Matrix Spikes:
All percent recoveries and relative percent differences (RPDs) were within acceptance criteria with any exceptions noted below.

Duplicate Sample:
All duplicate sample results were within method acceptance criteria with any exceptions noted below.

Additional Comments:

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PROJECT NARRATIVE

Project: Black Pine Mine REV
Pace Project No.: 10163634

Method: **EPA 9081**
Description: Cation Exchange Capacity
Client: Montana Dept. of Environmental Quality
Date: October 18, 2011

General Information:
3 samples were analyzed for EPA 9081. All samples were received in acceptable condition with any exceptions noted below.

Hold Time:
The samples were analyzed within the method required hold times with any exceptions noted below.

Initial Calibrations (including MS Tune as applicable):
All criteria were within method requirements with any exceptions noted below.

Continuing Calibration:
All criteria were within method requirements with any exceptions noted below.

Method Blank:
All analytes were below the report limit in the method blank with any exceptions noted below.

Laboratory Control Spike:
All laboratory control spike compounds were within QC limits with any exceptions noted below.

Matrix Spikes:
All percent recoveries and relative percent differences (RPDs) were within acceptance criteria with any exceptions noted below.

Duplicate Sample:
All duplicate sample results were within method acceptance criteria with any exceptions noted below.

Additional Comments:

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PROJECT NARRATIVE

Project: Black Pine Mine REV
Pace Project No.: 10163634

Method: **EPA 6020**
Description: 6020 MET ICPMS
Client: Montana Dept. of Environmental Quality
Date: October 18, 2011

General Information:
10 samples were analyzed for EPA 6020. All samples were received in acceptable condition with any exceptions noted below.

Hold Time:
The samples were analyzed within the method required hold times with any exceptions noted below.

Sample Preparation:
The samples were prepared in accordance with EPA 3050 with any exceptions noted below.

Initial Calibrations (including MS Tune as applicable):
All criteria were within method requirements with any exceptions noted below.

Continuing Calibration:
All criteria were within method requirements with any exceptions noted below.

Internal Standards:
All internal standards were within QC limits with any exceptions noted below.

Method Blank:
All analytes were below the report limit in the method blank with any exceptions noted below.

Laboratory Control Spike:
All laboratory control spike compounds were within QC limits with any exceptions noted below.

Matrix Spikes:
All percent recoveries and relative percent differences (RPDs) were within acceptance criteria with any exceptions noted below.

QC Batch: MPRP/27167

A matrix spike and matrix spike duplicate (MS/MSD) were performed on the following sample(s): 10163483007,10163634007

M6: Matrix spike and Matrix spike duplicate recovery not evaluated against control limits due to sample dilution.

- MS (Lab ID: 1014855)
  - Antimony
  - Arsenic
  - Barium
  - Cadmium
  - Chromium
  - Copper
  - Iron
  - Lead
  - Manganese
  - Nickel
  - Zinc
- MS (Lab ID: 1014857)
  - Antimony

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PROJECT NARRATIVE

Project: Black Pine Mine REV
Pace Project No.: 10163634

Method: **EPA 6020**
Description: 6020 MET ICPMS
Client: Montana Dept. of Environmental Quality
Date: October 18, 2011

QC Batch: MPRP/27167

A matrix spike and matrix spike duplicate (MS/MSD) were performed on the following sample(s): 10163483007,10163634007

M6: Matrix spike and Matrix spike duplicate recovery not evaluated against control limits due to sample dilution.

- Arsenic
- Barium
- Cadmium
- Chromium
- Copper
- Iron
- Lead
- Manganese
- Nickel
- Zinc

- MSD (Lab ID: 1014856)
  - Antimony
  - Arsenic
  - Barium
  - Cadmium
  - Chromium
  - Copper
  - Iron
  - Lead
  - Manganese
  - Nickel
  - Zinc

Duplicate Sample:
All duplicate sample results were within method acceptance criteria with any exceptions noted below.

Additional Comments:

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PROJECT NARRATIVE

Project: Black Pine Mine REV
Pace Project No.: 10163634

Method: **EPA 7471**
Description: 7471 Mercury
Client: Montana Dept. of Environmental Quality
Date: October 18, 2011

General Information:
10 samples were analyzed for EPA 7471. All samples were received in acceptable condition with any exceptions noted below.

Hold Time:
The samples were analyzed within the method required hold times with any exceptions noted below.

Sample Preparation:
The samples were prepared in accordance with EPA 7471 with any exceptions noted below.

Initial Calibrations (including MS Tune as applicable):
All criteria were within method requirements with any exceptions noted below.

Continuing Calibration:
All criteria were within method requirements with any exceptions noted below.

Method Blank:
All analytes were below the report limit in the method blank with any exceptions noted below.

Laboratory Control Spike:
All laboratory control spike compounds were within QC limits with any exceptions noted below.

Matrix Spikes:
All percent recoveries and relative percent differences (RPDs) were within acceptance criteria with any exceptions noted below.

QC Batch: MERP/5650

A matrix spike and matrix spike duplicate (MS/MSD) were performed on the following sample(s): 10163634009,10163643009

M1: Matrix spike recovery exceeded QC limits. Batch accepted based on laboratory control sample (LCS) recovery.

- MS (Lab ID: 1016609)
  - Mercury
- MSD (Lab ID: 1016610)
  - Mercury

M6: Matrix spike and Matrix spike duplicate recovery not evaluated against control limits due to sample dilution.

- MS (Lab ID: 1016611)
  - Mercury

QC Batch: MERP/5649

A matrix spike and matrix spike duplicate (MS/MSD) were performed on the following sample(s): 10163633001,10163634008

M1: Matrix spike recovery exceeded QC limits. Batch accepted based on laboratory control sample (LCS) recovery.

- MS (Lab ID: 1016606)
  - Mercury

M6: Matrix spike and Matrix spike duplicate recovery not evaluated against control limits due to sample dilution.

- MS (Lab ID: 1016604)
  - Mercury

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PROJECT NARRATIVE

Project: Black Pine Mine REV
Pace Project No.: 10163634

Method: **EPA 7471**
Description: 7471 Mercury
Client: Montana Dept. of Environmental Quality
Date: October 18, 2011

QC Batch: MERP/5649

A matrix spike and matrix spike duplicate (MS/MSD) were performed on the following sample(s): 10163633001,10163634008

M6: Matrix spike and Matrix spike duplicate recovery not evaluated against control limits due to sample dilution.

- MSD (Lab ID: 1016605)
  - Mercury

Duplicate Sample:
All duplicate sample results were within method acceptance criteria with any exceptions noted below.

Additional Comments:

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PROJECT NARRATIVE

Project: Black Pine Mine REV
Pace Project No.: 10163634

Method: **ASA 33-3.2/EPA 353.2**
Description: 353.2 Nitrate + Nitrite pres.
Client: Montana Dept. of Environmental Quality
Date: October 18, 2011

General Information:
3 samples were analyzed for ASA 33-3.2/EPA 353.2. All samples were received in acceptable condition with any exceptions noted below.

Hold Time:
The samples were analyzed within the method required hold times with any exceptions noted below.

Initial Calibrations (including MS Tune as applicable):
All criteria were within method requirements with any exceptions noted below.

Continuing Calibration:
All criteria were within method requirements with any exceptions noted below.

Internal Standards:
All internal standards were within QC limits with any exceptions noted below.

Surrogates:
All surrogates were within QC limits with any exceptions noted below.

Method Blank:
All analytes were below the report limit in the method blank with any exceptions noted below.

Laboratory Control Spike:
All laboratory control spike compounds were within QC limits with any exceptions noted below.

Matrix Spikes:
All percent recoveries and relative percent differences (RPDs) were within acceptance criteria with any exceptions noted below.

Duplicate Sample:
All duplicate sample results were within method acceptance criteria with any exceptions noted below.

Additional Comments:

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Billings, MT 591014549
(406)254-7226

PROJECT NARRATIVE

Project: Black Pine Mine REV
Pace Project No.: 10163634

Method: **ASTM D421**
Description: Coarse
Client: Montana Dept. of Environmental Quality
Date: October 18, 2011

General Information:
3 samples were analyzed for ASTM D421. All samples were received in acceptable condition with any exceptions noted below.

Hold Time:
The samples were analyzed within the method required hold times with any exceptions noted below.

Initial Calibrations (including MS Tune as applicable):
All criteria were within method requirements with any exceptions noted below.

Continuing Calibration:
All criteria were within method requirements with any exceptions noted below.

Internal Standards:
All internal standards were within QC limits with any exceptions noted below.

Surrogates:
All surrogates were within QC limits with any exceptions noted below.

Method Blank:
All analytes were below the report limit in the method blank with any exceptions noted below.

Laboratory Control Spike:
All laboratory control spike compounds were within QC limits with any exceptions noted below.

Matrix Spikes:
All percent recoveries and relative percent differences (RPDs) were within acceptance criteria with any exceptions noted below.

Duplicate Sample:
All duplicate sample results were within method acceptance criteria with any exceptions noted below.

Additional Comments:

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PROJECT NARRATIVE

Project: Black Pine Mine REV
Pace Project No.: 10163634

Method: **ASA 29-3.5.2**
Description: Organic Matter MT ASA 29
Client: Montana Dept. of Environmental Quality
Date: October 18, 2011

General Information:
3 samples were analyzed for ASA 29-3.5.2. All samples were received in acceptable condition with any exceptions noted below.

Hold Time:
The samples were analyzed within the method required hold times with any exceptions noted below.

Initial Calibrations (including MS Tune as applicable):
All criteria were within method requirements with any exceptions noted below.

Continuing Calibration:
All criteria were within method requirements with any exceptions noted below.

Internal Standards:
All internal standards were within QC limits with any exceptions noted below.

Surrogates:
All surrogates were within QC limits with any exceptions noted below.

Method Blank:
All analytes were below the report limit in the method blank with any exceptions noted below.

Laboratory Control Spike:
All laboratory control spike compounds were within QC limits with any exceptions noted below.

Matrix Spikes:
All percent recoveries and relative percent differences (RPDs) were within acceptance criteria with any exceptions noted below.

Duplicate Sample:
All duplicate sample results were within method acceptance criteria with any exceptions noted below.

Additional Comments:

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PROJECT NARRATIVE

Project: Black Pine Mine REV
Pace Project No.: 10163634

Method: **ASA 10-3.2**
Description: ASA 10-3.2 pH
Client: Montana Dept. of Environmental Quality
Date: October 18, 2011

General Information:
3 samples were analyzed for ASA 10-3.2. All samples were received in acceptable condition with any exceptions noted below.

Hold Time:
The samples were analyzed within the method required hold times with any exceptions noted below.

Initial Calibrations (including MS Tune as applicable):
All criteria were within method requirements with any exceptions noted below.

Continuing Calibration:
All criteria were within method requirements with any exceptions noted below.

Internal Standards:
All internal standards were within QC limits with any exceptions noted below.

Surrogates:
All surrogates were within QC limits with any exceptions noted below.

Method Blank:
All analytes were below the report limit in the method blank with any exceptions noted below.

Laboratory Control Spike:
All laboratory control spike compounds were within QC limits with any exceptions noted below.

Matrix Spikes:
All percent recoveries and relative percent differences (RPDs) were within acceptance criteria with any exceptions noted below.

Duplicate Sample:
All duplicate sample results were within method acceptance criteria with any exceptions noted below.

Additional Comments:

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PROJECT NARRATIVE

Project: Black Pine Mine REV
Pace Project No.: 10163634

Method: **ASA 24-5.4/SM4500**
Description: SM4500P-E, Total Phosphorus
Client: Montana Dept. of Environmental Quality
Date: October 18, 2011

General Information:
3 samples were analyzed for ASA 24-5.4/SM4500. All samples were received in acceptable condition with any exceptions noted below.

Hold Time:
The samples were analyzed within the method required hold times with any exceptions noted below.

Initial Calibrations (including MS Tune as applicable):
All criteria were within method requirements with any exceptions noted below.

Continuing Calibration:
All criteria were within method requirements with any exceptions noted below.

Internal Standards:
All internal standards were within QC limits with any exceptions noted below.

Surrogates:
All surrogates were within QC limits with any exceptions noted below.

Method Blank:
All analytes were below the report limit in the method blank with any exceptions noted below.

Laboratory Control Spike:
All laboratory control spike compounds were within QC limits with any exceptions noted below.

Matrix Spikes:
All percent recoveries and relative percent differences (RPDs) were within acceptance criteria with any exceptions noted below.

Duplicate Sample:
All duplicate sample results were within method acceptance criteria with any exceptions noted below.

Additional Comments:

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PROJECT NARRATIVE

Project: Black Pine Mine REV
Pace Project No.: 10163634

Method: **Modified Sobek 3.2**
Description: Sobek Acid Base Potential
Client: Montana Dept. of Environmental Quality
Date: October 18, 2011

General Information:
9 samples were analyzed for Modified Sobek 3.2. All samples were received in acceptable condition with any exceptions noted below.

Hold Time:
The samples were analyzed within the method required hold times with any exceptions noted below.

Initial Calibrations (including MS Tune as applicable):
All criteria were within method requirements with any exceptions noted below.

Continuing Calibration:
All criteria were within method requirements with any exceptions noted below.

Internal Standards:
All internal standards were within QC limits with any exceptions noted below.

Surrogates:
All surrogates were within QC limits with any exceptions noted below.

Method Blank:
All analytes were below the report limit in the method blank with any exceptions noted below.

Laboratory Control Spike:
All laboratory control spike compounds were within QC limits with any exceptions noted below.

Matrix Spikes:
All percent recoveries and relative percent differences (RPDs) were within acceptance criteria with any exceptions noted below.

Duplicate Sample:
All duplicate sample results were within method acceptance criteria with any exceptions noted below.

Additional Comments:

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PROJECT NARRATIVE

Project: Black Pine Mine REV
Pace Project No.: 10163634

Method: **Modified Sobek 3.2**
Description: Sobek Extractable Sulfur
Client: Montana Dept. of Environmental Quality
Date: October 18, 2011

General Information:
9 samples were analyzed for Modified Sobek 3.2. All samples were received in acceptable condition with any exceptions noted below.

Hold Time:
The samples were analyzed within the method required hold times with any exceptions noted below.

Initial Calibrations (including MS Tune as applicable):
All criteria were within method requirements with any exceptions noted below.

Continuing Calibration:
All criteria were within method requirements with any exceptions noted below.

Internal Standards:
All internal standards were within QC limits with any exceptions noted below.

Surrogates:
All surrogates were within QC limits with any exceptions noted below.

Method Blank:
All analytes were below the report limit in the method blank with any exceptions noted below.

Laboratory Control Spike:
All laboratory control spike compounds were within QC limits with any exceptions noted below.

Matrix Spikes:
All percent recoveries and relative percent differences (RPDs) were within acceptance criteria with any exceptions noted below.

Duplicate Sample:
All duplicate sample results were within method acceptance criteria with any exceptions noted below.

Additional Comments:

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PROJECT NARRATIVE

Project: Black Pine Mine REV
Pace Project No.: 10163634

Method: **Modified Sobek 3.2**
Description: Sobek Calculations
Client: Montana Dept. of Environmental Quality
Date: October 18, 2011

General Information:
9 samples were analyzed for Modified Sobek 3.2. All samples were received in acceptable condition with any exceptions noted below.

Hold Time:
The samples were analyzed within the method required hold times with any exceptions noted below.

Initial Calibrations (including MS Tune as applicable):
All criteria were within method requirements with any exceptions noted below.

Continuing Calibration:
All criteria were within method requirements with any exceptions noted below.

Internal Standards:
All internal standards were within QC limits with any exceptions noted below.

Surrogates:
All surrogates were within QC limits with any exceptions noted below.

Method Blank:
All analytes were below the report limit in the method blank with any exceptions noted below.

Laboratory Control Spike:
All laboratory control spike compounds were within QC limits with any exceptions noted below.

Matrix Spikes:
All percent recoveries and relative percent differences (RPDs) were within acceptance criteria with any exceptions noted below.

Duplicate Sample:
All duplicate sample results were within method acceptance criteria with any exceptions noted below.

Additional Comments:

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PROJECT NARRATIVE

Project: Black Pine Mine REV
Pace Project No.: 10163634

Method: **Modified Sobek 3.2**
Description: Sobek SMP Buffer pH
Client: Montana Dept. of Environmental Quality
Date: October 18, 2011

General Information:
9 samples were analyzed for Modified Sobek 3.2. All samples were received in acceptable condition with any exceptions noted below.

Hold Time:
The samples were analyzed within the method required hold times with any exceptions noted below.

Initial Calibrations (including MS Tune as applicable):
All criteria were within method requirements with any exceptions noted below.

Continuing Calibration:
All criteria were within method requirements with any exceptions noted below.

Internal Standards:
All internal standards were within QC limits with any exceptions noted below.

Surrogates:
All surrogates were within QC limits with any exceptions noted below.

Method Blank:
All analytes were below the report limit in the method blank with any exceptions noted below.

Laboratory Control Spike:
All laboratory control spike compounds were within QC limits with any exceptions noted below.

Matrix Spikes:
All percent recoveries and relative percent differences (RPDs) were within acceptance criteria with any exceptions noted below.

Duplicate Sample:
All duplicate sample results were within method acceptance criteria with any exceptions noted below.

Additional Comments:

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PROJECT NARRATIVE

Project: Black Pine Mine REV
Pace Project No.: 10163634

Method: **ASA 10-3.3**
Description: ASA10-3.3 Specific Conductance
Client: Montana Dept. of Environmental Quality
Date: October 18, 2011

General Information:
2 samples were analyzed for ASA 10-3.3. All samples were received in acceptable condition with any exceptions noted below.

Hold Time:
The samples were analyzed within the method required hold times with any exceptions noted below.

Initial Calibrations (including MS Tune as applicable):
All criteria were within method requirements with any exceptions noted below.

Continuing Calibration:
All criteria were within method requirements with any exceptions noted below.

Internal Standards:
All internal standards were within QC limits with any exceptions noted below.

Surrogates:
All surrogates were within QC limits with any exceptions noted below.

Method Blank:
All analytes were below the report limit in the method blank with any exceptions noted below.

Laboratory Control Spike:
All laboratory control spike compounds were within QC limits with any exceptions noted below.

Matrix Spikes:
All percent recoveries and relative percent differences (RPDs) were within acceptance criteria with any exceptions noted below.

Duplicate Sample:
All duplicate sample results were within method acceptance criteria with any exceptions noted below.

QC Batch: MT/6547

D6: The relative percent difference (RPD) between the sample and sample duplicate exceeded laboratory control limits.

- DUP (Lab ID: 1022943)
  - Sp.Conductance Saturated Paste

Additional Comments:

This data package has been reviewed for quality and completeness and is approved for release.

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ANALYTICAL RESULTS

Project: Black Pine Mine REV
Pace Project No.: 10163634

Sample: BP-CMN-SS-04-00 **Lab ID: 10163634001** Collected: 07/14/11 12:45 Received: 07/16/11 20:03 Matrix: Solid

Results reported on a "dry-weight" basis

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
6020 MET ICPMS	Analytical Method: EPA 6020 Preparation Method: EPA 3050							
Antimony	**26.2**	mg/kg	0.54	20	08/01/11 15:14	08/04/11 17:30	7440-36-0	
Arsenic	**35.0**	mg/kg	0.54	20	08/01/11 15:14	08/04/11 17:30	7440-38-2	
Barium	**180**	mg/kg	0.33	20	08/01/11 15:14	08/04/11 17:30	7440-39-3	
Cadmium	**0.39**	mg/kg	0.087	20	08/01/11 15:14	08/04/11 17:30	7440-43-9	
Chromium	**4.1**	mg/kg	0.54	20	08/01/11 15:14	08/04/11 17:30	7440-47-3	
Cobalt	**3.7**	mg/kg	0.54	20	08/01/11 15:14	08/04/11 17:30	7440-48-4	
Copper	**57.8**	mg/kg	0.54	20	08/01/11 15:14	08/04/11 17:30	7440-50-8	
Iron	**8820**	mg/kg	54.4	20	08/01/11 15:14	08/04/11 17:30	7439-89-6	
Lead	**261**	mg/kg	0.11	20	08/01/11 15:14	08/04/11 17:30	7439-92-1	
Manganese	**480**	mg/kg	0.54	20	08/01/11 15:14	08/04/11 17:30	7439-96-5	
Nickel	**4.8**	mg/kg	0.54	20	08/01/11 15:14	08/04/11 17:30	7440-02-0	
Zinc	**81.5**	mg/kg	5.4	20	08/01/11 15:14	08/04/11 17:30	7440-66-6	
7471 Mercury	Analytical Method: EPA 7471 Preparation Method: EPA 7471							
Mercury	**<0.020**	mg/kg	0.020	1	07/28/11 19:18	08/01/11 16:23	7439-97-6	
Dry Weight	Analytical Method: % Moisture							
Percent Moisture	**10.8**	%	0.10	1		07/25/11 00:00		
Sobek Acid Base Potential	Analytical Method: Modified Sobek 3.2							
Neutralization Potential	**0.73**	tons/1000	0.50	1		08/01/11 00:00		
Sobek Extractable Sulfur	Analytical Method: Modified Sobek 3.2							
Sulfur, HCl Extractable	**<0.050**	% (w/w)	0.050	1		08/08/11 14:49		
Sulfur, HNO3 Extractable	**<0.050**	% (w/w)	0.050	1		08/08/11 14:49		
Sulfur, Hot Water Extractable	**<0.050**	% (w/w)	0.050	1		08/08/11 14:49		
Sulfur, Residual	**<0.050**	% (w/w)	0.050	1		08/08/11 14:49		
Total Sulfur	**<0.050**	% (w/w)	0.050	1		08/08/11 14:49		
Sobek Calculations	Analytical Method: Modified Sobek 3.2							
Acid/Base Potential	**3**	tons/1000		1		08/01/11 00:00		
Acid Potential	**<4.3**	tons/1000	4.3	1		08/01/11 00:00		
Lime Requirement	**<5.4**	tons/1000	5.4	1		08/01/11 00:00		
SMP Lime Requirement	**0**	tons/1000	0.0	1		08/01/11 00:00		
Sobek SMP Buffer pH	Analytical Method: Modified Sobek 3.2							
SMP Buffer pH	**7.3**	Std. Units	0.10	1		07/29/11 13:24		

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ANALYTICAL RESULTS

Project: Black Pine Mine REV
Pace Project No.: 10163634

Sample: BP-CMN-RS-04-02 **Lab ID: 10163634002** Collected: 07/14/11 12:35 Received: 07/16/11 20:03 Matrix: Solid

Results reported on a "dry-weight" basis

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
6020 MET ICPMS	Analytical Method: EPA 6020 Preparation Method: EPA 3050							
Antimony	**424**	mg/kg	0.76	20	08/01/11 15:14	08/04/11 17:38	7440-36-0	
Arsenic	**216**	mg/kg	0.76	20	08/01/11 15:14	08/04/11 17:38	7440-38-2	
Barium	**92.2**	mg/kg	0.45	20	08/01/11 15:14	08/04/11 17:38	7440-39-3	
Cadmium	**3.7**	mg/kg	0.12	20	08/01/11 15:14	08/04/11 17:38	7440-43-9	
Chromium	**1.3**	mg/kg	0.76	20	08/01/11 15:14	08/04/11 17:38	7440-47-3	
Cobalt	**<0.76**	mg/kg	0.76	20	08/01/11 15:14	08/04/11 17:38	7440-48-4	
Copper	**309**	mg/kg	0.76	20	08/01/11 15:14	08/04/11 17:38	7440-50-8	
Iron	**9400**	mg/kg	75.8	20	08/01/11 15:14	08/04/11 17:38	7439-89-6	
Lead	**1910**	mg/kg	3.8	500	08/01/11 15:14	08/04/11 17:42	7439-92-1	
Manganese	**110**	mg/kg	0.76	20	08/01/11 15:14	08/04/11 17:38	7439-96-5	
Nickel	**1.5**	mg/kg	0.76	20	08/01/11 15:14	08/04/11 17:38	7440-02-0	
Zinc	**423**	mg/kg	7.6	20	08/01/11 15:14	08/04/11 17:38	7440-66-6	
7471 Mercury	Analytical Method: EPA 7471 Preparation Method: EPA 7471							
Mercury	**0.28**	mg/kg	0.024	1	07/28/11 19:18	08/01/11 16:25	7439-97-6	
Dry Weight	Analytical Method: % Moisture							
Percent Moisture	**35.4**	%	0.10	1		07/25/11 00:00		
Sobek Acid Base Potential	Analytical Method: Modified Sobek 3.2							
Neutralization Potential	**<0.5**	tons/1000	0.50	1		08/01/11 00:00		
Sobek Extractable Sulfur	Analytical Method: Modified Sobek 3.2							
Sulfur, HCl Extractable	**0.132**	% (w/w)	0.050	1		08/08/11 15:15		
Sulfur, HNO3 Extractable	**<0.050**	% (w/w)	0.050	1		08/08/11 15:15		
Sulfur, Hot Water Extractable	**0.223**	% (w/w)	0.050	1		08/08/11 15:15		
Sulfur, Residual	**<0.050**	% (w/w)	0.050	1		08/08/11 15:15		
Total Sulfur	**0.415**	% (w/w)	0.050	1		08/08/11 15:15		
Sobek Calculations	Analytical Method: Modified Sobek 3.2							
Acid/Base Potential	**-5.0**	tons/1000		1		08/01/11 00:00		
Acid Potential	**5.0**	tons/1000	4.3	1		08/01/11 00:00		
Lime Requirement	**7.5**	tons/1000	5.4	1		08/01/11 00:00		
SMP Lime Requirement	**1.0**	tons/1000	0.0	1		08/01/11 00:00		
Sobek SMP Buffer pH	Analytical Method: Modified Sobek 3.2							
SMP Buffer pH	**6.8**	Std. Units	0.10	1		07/29/11 13:24		

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ANALYTICAL RESULTS

Project: Black Pine Mine REV
Pace Project No.: 10163634

Sample: BP-CMN-RS-04-05 **Lab ID: 10163634003** Collected: 07/14/11 12:40 Received: 07/16/11 20:03 Matrix: Solid

Results reported on a "dry-weight" basis

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
6020 MET ICPMS	Analytical Method: EPA 6020 Preparation Method: EPA 3050							
Antimony	**986**	mg/kg	18.3	500	08/01/11 15:14	08/04/11 17:51	7440-36-0	
Arsenic	**439**	mg/kg	0.73	20	08/01/11 15:14	08/04/11 17:47	7440-38-2	
Barium	**114**	mg/kg	0.44	20	08/01/11 15:14	08/04/11 17:47	7440-39-3	
Cadmium	**10.2**	mg/kg	0.12	20	08/01/11 15:14	08/04/11 17:47	7440-43-9	
Chromium	**0.90**	mg/kg	0.73	20	08/01/11 15:14	08/04/11 17:47	7440-47-3	
Cobalt	**<0.73**	mg/kg	0.73	20	08/01/11 15:14	08/04/11 17:47	7440-48-4	
Copper	**464**	mg/kg	0.73	20	08/01/11 15:14	08/04/11 17:47	7440-50-8	
Iron	**19400**	mg/kg	73.3	20	08/01/11 15:14	08/04/11 17:47	7439-89-6	
Lead	**2750**	mg/kg	3.7	500	08/01/11 15:14	08/04/11 17:51	7439-92-1	
Manganese	**36.8**	mg/kg	0.73	20	08/01/11 15:14	08/04/11 17:47	7439-96-5	
Nickel	**1.1**	mg/kg	0.73	20	08/01/11 15:14	08/04/11 17:47	7440-02-0	
Zinc	**1040**	mg/kg	183	500	08/01/11 15:14	08/04/11 17:51	7440-66-6	
7471 Mercury	Analytical Method: EPA 7471 Preparation Method: EPA 7471							
Mercury	**0.13**	mg/kg	0.030	1	07/28/11 19:18	08/01/11 16:27	7439-97-6	
Dry Weight	Analytical Method: % Moisture							
Percent Moisture	**34.4**	%	0.10	1		07/25/11 00:00		
Sobek Acid Base Potential	Analytical Method: Modified Sobek 3.2							
Neutralization Potential	**<0.5**	tons/1000	0.50	1		08/01/11 00:00		
Sobek Extractable Sulfur	Analytical Method: Modified Sobek 3.2							
Sulfur, HCl Extractable	**0.127**	% (w/w)	0.050	1		08/08/11 15:27		
Sulfur, HNO3 Extractable	**0.108**	% (w/w)	0.050	1		08/08/11 15:27		
Sulfur, Hot Water Extractable	**0.276**	% (w/w)	0.050	1		08/08/11 15:27		
Sulfur, Residual	**<0.050**	% (w/w)	0.050	1		08/08/11 15:27		
Total Sulfur	**0.512**	% (w/w)	0.050	1		08/08/11 15:27		
Sobek Calculations	Analytical Method: Modified Sobek 3.2							
Acid/Base Potential	**-6.4**	tons/1000		1		08/01/11 00:00		
Acid Potential	**6.4**	tons/1000	4.3	1		08/01/11 00:00		
Lime Requirement	**9.2**	tons/1000	5.4	1		08/01/11 00:00		
SMP Lime Requirement	**1.0**	tons/1000	0.0	1		08/01/11 00:00		
Sobek SMP Buffer pH	Analytical Method: Modified Sobek 3.2							
SMP Buffer pH	**6.8**	Std. Units	0.10	1		07/29/11 13:24		

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ANALYTICAL RESULTS

Project: Black Pine Mine REV
Pace Project No.: 10163634

Sample: BP-CMN-SS-04-08 **Lab ID: 10163634004** Collected: 07/14/11 12:30 Received: 07/16/11 20:03 Matrix: Solid

Results reported on a "dry-weight" basis

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
6020 MET ICPMS	Analytical Method: EPA 6020 Preparation Method: EPA 3050							
Antimony	**0.74**	mg/kg	0.56	20	08/01/11 15:14	08/04/11 17:55	7440-36-0	
Arsenic	**7.9**	mg/kg	0.56	20	08/01/11 15:14	08/04/11 17:55	7440-38-2	
Barium	**63.0**	mg/kg	0.33	20	08/01/11 15:14	08/04/11 17:55	7440-39-3	
Cadmium	**0.11**	mg/kg	0.089	20	08/01/11 15:14	08/04/11 17:55	7440-43-9	
Chromium	**3.7**	mg/kg	0.56	20	08/01/11 15:14	08/04/11 17:55	7440-47-3	
Cobalt	**1.4**	mg/kg	0.56	20	08/01/11 15:14	08/04/11 17:55	7440-48-4	
Copper	**26.8**	mg/kg	0.56	20	08/01/11 15:14	08/04/11 17:55	7440-50-8	
Iron	**5680**	mg/kg	55.5	20	08/01/11 15:14	08/04/11 17:55	7439-89-6	
Lead	**5.3**	mg/kg	0.11	20	08/01/11 15:14	08/04/11 17:55	7439-92-1	
Manganese	**56.9**	mg/kg	0.56	20	08/01/11 15:14	08/04/11 17:55	7439-96-5	
Nickel	**2.5**	mg/kg	0.56	20	08/01/11 15:14	08/04/11 17:55	7440-02-0	
Zinc	**17.7**	mg/kg	5.6	20	08/01/11 15:14	08/04/11 17:55	7440-66-6	
7471 Mercury	Analytical Method: EPA 7471 Preparation Method: EPA 7471							
Mercury	**<0.023**	mg/kg	0.023	1	07/28/11 19:18	08/01/11 16:29	7439-97-6	
Dry Weight	Analytical Method: % Moisture							
Percent Moisture	**12.6**	%	0.10	1		07/25/11 00:00		

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ANALYTICAL RESULTS

Project: Black Pine Mine REV
Pace Project No.: 10163634

Sample: BP-CMN-SS-07-00 **Lab ID: 10163634005** Collected: 07/14/11 12:35 Received: 07/16/11 20:03 Matrix: Solid

Results reported on a "dry-weight" basis

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
6020 MET ICPMS	Analytical Method: EPA 6020 Preparation Method: EPA 3050							
Antimony	**1.5**	mg/kg	0.55	20	08/01/11 15:14	08/04/11 18:03	7440-36-0	
Arsenic	**12.2**	mg/kg	0.55	20	08/01/11 15:14	08/04/11 18:03	7440-38-2	
Barium	**85.4**	mg/kg	0.33	20	08/01/11 15:14	08/04/11 18:03	7440-39-3	
Cadmium	**0.41**	mg/kg	0.088	20	08/01/11 15:14	08/04/11 18:03	7440-43-9	
Chromium	**12.2**	mg/kg	0.55	20	08/01/11 15:14	08/04/11 18:03	7440-47-3	
Cobalt	**6.6**	mg/kg	0.55	20	08/01/11 15:14	08/04/11 18:03	7440-48-4	
Copper	**30.9**	mg/kg	0.55	20	08/01/11 15:14	08/04/11 18:03	7440-50-8	
Iron	**15300**	mg/kg	54.7	20	08/01/11 15:14	08/04/11 18:03	7439-89-6	
Lead	**19.7**	mg/kg	0.11	20	08/01/11 15:14	08/04/11 18:03	7439-92-1	
Manganese	**252**	mg/kg	0.55	20	08/01/11 15:14	08/04/11 18:03	7439-96-5	
Nickel	**8.2**	mg/kg	0.55	20	08/01/11 15:14	08/04/11 18:03	7440-02-0	
Zinc	**57.0**	mg/kg	5.5	20	08/01/11 15:14	08/04/11 18:03	7440-66-6	
7471 Mercury	Analytical Method: EPA 7471 Preparation Method: EPA 7471							
Mercury	**<0.021**	mg/kg	0.021	1	07/28/11 19:18	08/01/11 16:35	7439-97-6	
Dry Weight	Analytical Method: % Moisture							
Percent Moisture	**8.6**	%	0.10	1		07/25/11 00:00		
Sobek Acid Base Potential	Analytical Method: Modified Sobek 3.2							
Neutralization Potential	**1.2**	tons/1000	0.50	1		08/01/11 00:00		
Sobek Extractable Sulfur	Analytical Method: Modified Sobek 3.2							
Sulfur, HCl Extractable	**<0.050**	% (w/w)	0.050	1		08/09/11 07:32		
Sulfur, HNO3 Extractable	**<0.050**	% (w/w)	0.050	1		08/09/11 07:32		
Sulfur, Hot Water Extractable	**<0.050**	% (w/w)	0.050	1		08/09/11 07:32		
Sulfur, Residual	**<0.050**	% (w/w)	0.050	1		08/09/11 07:32		
Total Sulfur	**<0.050**	% (w/w)	0.050	1		08/09/11 07:32		
Sobek Calculations	Analytical Method: Modified Sobek 3.2							
Acid/Base Potential	**1.2**	tons/1000		1		08/01/11 00:00		
Acid Potential	**<4.3**	tons/1000	4.3	1		08/01/11 00:00		
Lime Requirement	**<5.4**	tons/1000	5.4	1		08/01/11 00:00		
SMP Lime Requirement	**0**	tons/1000	0.0	1		08/01/11 00:00		
Sobek SMP Buffer pH	Analytical Method: Modified Sobek 3.2							
SMP Buffer pH	**7.1**	Std. Units	0.10	1		07/29/11 13:24		

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ANALYTICAL RESULTS

Project: Black Pine Mine REV
Pace Project No.: 10163634

Sample: BP-CMN-SS-07-06 **Lab ID: 10163634006** Collected: 07/14/11 13:40 Received: 07/16/11 20:03 Matrix: Solid

Results reported on a "dry-weight" basis

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
6010 MET ICP, MDEQ Potassium	Analytical Method: CLPICPAES Preparation Method: ASA 13-3.5.2.2							
Potassium	**<122**	mg/kg	122	5	08/01/11 17:34	08/01/11 18:50	7440-09-7	
Cation Exchange Capacity	Analytical Method: EPA 9081							
Cation Exchange Capacity	**22.1**	meq/100g	0.98	10	08/03/11 14:00	08/05/11 13:47		
6020 MET ICPMS	Analytical Method: EPA 6020 Preparation Method: EPA 3050							
Antimony	**1.3**	mg/kg	0.55	20	08/01/11 15:14	08/04/11 18:24	7440-36-0	
Arsenic	**12.4**	mg/kg	0.55	20	08/01/11 15:14	08/04/11 18:24	7440-38-2	
Barium	**111**	mg/kg	0.33	20	08/01/11 15:14	08/04/11 18:24	7440-39-3	
Cadmium	**<0.088**	mg/kg	0.088	20	08/01/11 15:14	08/04/11 18:24	7440-43-9	
Chromium	**11.9**	mg/kg	0.55	20	08/01/11 15:14	08/04/11 18:24	7440-47-3	
Cobalt	**10.3**	mg/kg	0.55	20	08/01/11 15:14	08/04/11 18:24	7440-48-4	
Copper	**14.9**	mg/kg	0.55	20	08/01/11 15:14	08/04/11 18:24	7440-50-8	
Iron	**14000**	mg/kg	55.2	20	08/01/11 15:14	08/04/11 18:24	7439-89-6	
Lead	**24.8**	mg/kg	0.11	20	08/01/11 15:14	08/04/11 18:24	7439-92-1	
Manganese	**393**	mg/kg	0.55	20	08/01/11 15:14	08/04/11 18:24	7439-96-5	
Nickel	**9.7**	mg/kg	0.55	20	08/01/11 15:14	08/04/11 18:24	7440-02-0	
Zinc	**30.5**	mg/kg	5.5	20	08/01/11 15:14	08/04/11 18:24	7440-66-6	
7471 Mercury	Analytical Method: EPA 7471 Preparation Method: EPA 7471							
Mercury	**<0.020**	mg/kg	0.020	1	07/28/11 19:18	08/01/11 16:37	7439-97-6	
Dry Weight	Analytical Method: % Moisture							
Percent Moisture	**10.3**	%	0.10	1		07/25/11 00:00		
353.2 Nitrate + Nitrite pres.	Analytical Method: ASA 33-3.2/EPA 353.2							
Available Nitrate	**<5.0**	mg/kg	5.0	1		07/26/11 18:04		
Coarse	Analytical Method: ASTM D421							
Coarse Fragment	**19.3**	% (w/w)	0.10	1		07/26/11 12:15		
Organic Matter MT ASA 29	Analytical Method: ASA 29-3.5.2							
Organic Matter	**<0.10**	% (w/w)	0.10	1		07/21/11 16:50		
ASA 10-3.2 pH	Analytical Method: ASA 10-3.2							
pH, Saturated Paste	**7.2**	Std. Units	0.10	1		07/27/11 17:35		
SM4500P-E, Total Phosphorus	Analytical Method: ASA 24-5.4/SM4500							
Available Phosphorus	**<1.0**	mg/kg	1.0	1		07/25/11 14:44	7723-14-0	
Sobek Acid Base Potential	Analytical Method: Modified Sobek 3.2							
Neutralization Potential	**2.0**	tons/1000	0.50	1		07/29/11 00:00		

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ANALYTICAL RESULTS

Project: Black Pine Mine REV
Pace Project No.: 10163634

Sample: BP-CMN-SS-07-06 **Lab ID: 10163634006** Collected: 07/14/11 13:40 Received: 07/16/11 20:03 Matrix: Solid

Results reported on a "dry-weight" basis

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
Sobek Extractable Sulfur	Analytical Method: Modified Sobek 3.2							
Sulfur, HCl Extractable	**<0.050**	% (w/w)	0.050	1		07/26/11 15:00		
Sulfur, HNO3 Extractable	**<0.050**	% (w/w)	0.050	1		07/26/11 15:00		
Sulfur, Hot Water Extractable	**<0.050**	% (w/w)	0.050	1		07/26/11 15:00		
Sulfur, Residual	**<0.050**	% (w/w)	0.050	1		07/26/11 15:00		
Total Sulfur	**<0.050**	% (w/w)	0.050	1		07/26/11 15:00		
Sobek Calculations	Analytical Method: Modified Sobek 3.2							
Acid/Base Potential	**2.0**	tons/1000		1		07/26/11 15:00		
Acid Potential	**<4.3**	tons/1000	4.3	1		07/26/11 15:00		
Lime Requirement	**<5.4**	tons/1000	5.4	1		07/26/11 15:00		
SMP Lime Requirement	**0.3**	tons/1000	0.0	1		07/26/11 15:00		
Sobek SMP Buffer pH	Analytical Method: Modified Sobek 3.2							
SMP Buffer pH	**6.8**	Std. Units	0.10	1		07/26/11 15:00		

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ANALYTICAL RESULTS

Project: Black Pine Mine REV
Pace Project No.: 10163634

Sample: BP-CMN-SS-08-00 **Lab ID: 10163634007** Collected: 07/14/11 14:05 Received: 07/16/11 20:03 Matrix: Solid

Results reported on a "dry-weight" basis

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
6020 MET ICPMS	Analytical Method: EPA 6020 Preparation Method: EPA 3050							
Antimony	**3.3**	mg/kg	0.60	20	08/01/11 15:14	08/04/11 04:14	7440-36-0	M6
Arsenic	**14.4**	mg/kg	0.60	20	08/01/11 15:14	08/04/11 04:14	7440-38-2	M6
Barium	**64.7**	mg/kg	0.36	20	08/01/11 15:14	08/04/11 04:14	7440-39-3	M6
Cadmium	**1.6**	mg/kg	0.096	20	08/01/11 15:14	08/04/11 04:14	7440-43-9	M6
Chromium	**7.6**	mg/kg	0.60	20	08/01/11 15:14	08/04/11 04:14	7440-47-3	M6
Cobalt	**8.2**	mg/kg	0.60	20	08/01/11 15:14	08/04/11 04:14	7440-48-4	
Copper	**220**	mg/kg	0.60	20	08/01/11 15:14	08/04/11 04:14	7440-50-8	M6
Iron	**11000**	mg/kg	59.8	20	08/01/11 15:14	08/04/11 04:14	7439-89-6	M6
Lead	**24.4**	mg/kg	0.12	20	08/01/11 15:14	08/04/11 04:14	7439-92-1	M6
Manganese	**419**	mg/kg	0.60	20	08/01/11 15:14	08/04/11 04:14	7439-96-5	M6
Nickel	**4.8**	mg/kg	0.60	20	08/01/11 15:14	08/04/11 04:14	7440-02-0	M6
Zinc	**101**	mg/kg	6.0	20	08/01/11 15:14	08/04/11 04:14	7440-66-6	M6
7471 Mercury	Analytical Method: EPA 7471 Preparation Method: EPA 7471							
Mercury	**<0.022**	mg/kg	0.022	1	07/28/11 19:18	08/01/11 16:39	7439-97-6	
Dry Weight	Analytical Method: % Moisture							
Percent Moisture	**16.4**	%	0.10	1		07/25/11 00:00		
Sobek Acid Base Potential	Analytical Method: Modified Sobek 3.2							
Neutralization Potential	**1.7**	tons/1000	0.50	1		08/01/11 00:00		
Sobek Extractable Sulfur	Analytical Method: Modified Sobek 3.2							
Sulfur, HCl Extractable	**<0.050**	% (w/w)	0.050	1		08/09/11 07:41		
Sulfur, HNO3 Extractable	**<0.050**	% (w/w)	0.050	1		08/09/11 07:41		
Sulfur, Hot Water Extractable	**<0.050**	% (w/w)	0.050	1		08/09/11 07:41		
Sulfur, Residual	**<0.050**	% (w/w)	0.050	1		08/09/11 07:41		
Total Sulfur	**<0.050**	% (w/w)	0.050	1		08/09/11 07:41		
Sobek Calculations	Analytical Method: Modified Sobek 3.2							
Acid/Base Potential	**1.7**	tons/1000		1		08/01/11 00:00		
Acid Potential	**<4.3**	tons/1000	4.3	1		08/01/11 00:00		
Lime Requirement	**<5.4**	tons/1000	5.4	1		08/01/11 00:00		
SMP Lime Requirement	**0**	tons/1000	0.0	1		08/01/11 00:00		
Sobek SMP Buffer pH	Analytical Method: Modified Sobek 3.2							
SMP Buffer pH	**7.0**	Std. Units	0.10	1		07/29/11 13:24		

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ANALYTICAL RESULTS

Project: Black Pine Mine REV
Pace Project No.: 10163634

Sample: BP-CMN-SS-08-03 **Lab ID: 10163634008** Collected: 07/14/11 14:10 Received: 07/16/11 20:03 Matrix: Solid

Results reported on a "dry-weight" basis

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
6010 MET ICP, MDEQ Potassium	Analytical Method: CLPICPAES Preparation Method: ASA 13-3.5.2.2							
Potassium	**<116**	mg/kg	116	5	08/01/11 17:34	08/01/11 18:54	7440-09-7	
Cation Exchange Capacity	Analytical Method: EPA 9081							
Cation Exchange Capacity	**22.1**	meq/100g	0.98	10	08/03/11 14:00	08/05/11 13:51		
6020 MET ICPMS	Analytical Method: EPA 6020 Preparation Method: EPA 3050							
Antimony	**1.1**	mg/kg	0.62	20	08/01/11 15:14	08/04/11 18:33	7440-36-0	
Arsenic	**7.6**	mg/kg	0.62	20	08/01/11 15:14	08/04/11 18:33	7440-38-2	
Barium	**136**	mg/kg	0.37	20	08/01/11 15:14	08/04/11 18:33	7440-39-3	
Cadmium	**0.71**	mg/kg	0.10	20	08/01/11 15:14	08/04/11 18:33	7440-43-9	
Chromium	**8.4**	mg/kg	0.62	20	08/01/11 15:14	08/04/11 18:33	7440-47-3	
Cobalt	**5.2**	mg/kg	0.62	20	08/01/11 15:14	08/04/11 18:33	7440-48-4	
Copper	**124**	mg/kg	0.62	20	08/01/11 15:14	08/04/11 18:33	7440-50-8	
Iron	**10300**	mg/kg	62.3	20	08/01/11 15:14	08/04/11 18:33	7439-89-6	
Lead	**14.8**	mg/kg	0.12	20	08/01/11 15:14	08/04/11 18:33	7439-92-1	
Manganese	**193**	mg/kg	0.62	20	08/01/11 15:14	08/04/11 18:33	7439-96-5	
Nickel	**5.6**	mg/kg	0.62	20	08/01/11 15:14	08/04/11 18:33	7440-02-0	
Zinc	**62.7**	mg/kg	6.2	20	08/01/11 15:14	08/04/11 18:33	7440-66-6	
7471 Mercury	Analytical Method: EPA 7471 Preparation Method: EPA 7471							
Mercury	**<0.021**	mg/kg	0.021	1	07/28/11 19:18	08/01/11 16:42	7439-97-6	M1
Dry Weight	Analytical Method: % Moisture							
Percent Moisture	**22.9**	%	0.10	1		07/25/11 00:00		
353.2 Nitrate + Nitrite pres.	Analytical Method: ASA 33-3.2/EPA 353.2							
Available Nitrate	**<5.0**	mg/kg	5.0	1		07/26/11 18:06		
Coarse	Analytical Method: ASTM D421							
Coarse Fragment	**19.3**	% (w/w)	0.10	1		07/26/11 12:15		
Organic Matter MT ASA 29	Analytical Method: ASA 29-3.5.2							
Organic Matter	**0.13**	% (w/w)	0.10	1		07/21/11 16:50		
ASA 10-3.2 pH	Analytical Method: ASA 10-3.2							
pH, Saturated Paste	**6.8**	Std. Units	0.10	1		07/27/11 17:35		
SM4500P-E, Total Phosphorus	Analytical Method: ASA 24-5.4/SM4500							
Available Phosphorus	**1.6**	mg/kg	1.0	1		07/25/11 14:47	7723-14-0	
Sobek Acid Base Potential	Analytical Method: Modified Sobek 3.2							
Neutralization Potential	**1.7**	tons/1000	0.50	1		07/29/11 00:00		

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ANALYTICAL RESULTS

Project: Black Pine Mine REV
Pace Project No.: 10163634

Sample: BP-CMN-SS-08-03 **Lab ID: 10163634008** Collected: 07/14/11 14:10 Received: 07/16/11 20:03 Matrix: Solid

Results reported on a "dry-weight" basis

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
Sobek Extractable Sulfur	Analytical Method: Modified Sobek 3.2							
Sulfur, HCl Extractable	**<0.050**	% (w/w)	0.050	1		07/26/11 15:00		
Sulfur, HNO3 Extractable	**<0.050**	% (w/w)	0.050	1		07/26/11 15:00		
Sulfur, Hot Water Extractable	**<0.050**	% (w/w)	0.050	1		07/26/11 15:00		
Sulfur, Residual	**<0.050**	% (w/w)	0.050	1		07/26/11 15:00		
Total Sulfur	**<0.050**	% (w/w)	0.050	1		07/26/11 15:00		
Sobek Calculations	Analytical Method: Modified Sobek 3.2							
Acid/Base Potential	**1.7**	tons/1000		1		07/26/11 15:00		
Acid Potential	**<4.3**	tons/1000	4.3	1		07/26/11 15:00		
Lime Requirement	**<5.4**	tons/1000	5.4	1		07/26/11 15:00		
SMP Lime Requirement	**1**	tons/1000	0.0	1		07/26/11 15:00		
Sobek SMP Buffer pH	Analytical Method: Modified Sobek 3.2							
SMP Buffer pH	**6.8**	Std. Units	0.10	1		07/26/11 15:00		
ASA10-3.3 Specific Conductance	Analytical Method: ASA 10-3.3							
Sp.Conductance Saturated Paste	**323**	mmhos/cm	0.010	1		08/03/11 19:49		

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ANALYTICAL RESULTS

Project: Black Pine Mine REV
Pace Project No.: 10163634

Sample: BP-CMN-SS-09-00 **Lab ID: 10163634009** Collected: 07/14/11 14:30 Received: 07/16/11 20:03 Matrix: Solid

Results reported on a "dry-weight" basis

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
6020 MET ICPMS	Analytical Method: EPA 6020 Preparation Method: EPA 3050							
Antimony	**1.4**	mg/kg	0.55	20	08/01/11 15:14	08/04/11 18:41	7440-36-0	
Arsenic	**9.7**	mg/kg	0.55	20	08/01/11 15:14	08/04/11 18:41	7440-38-2	
Barium	**250**	mg/kg	0.33	20	08/01/11 15:14	08/04/11 18:41	7440-39-3	
Cadmium	**2.7**	mg/kg	0.088	20	08/01/11 15:14	08/04/11 18:41	7440-43-9	
Chromium	**7.8**	mg/kg	0.55	20	08/01/11 15:14	08/04/11 18:41	7440-47-3	
Cobalt	**6.0**	mg/kg	0.55	20	08/01/11 15:14	08/04/11 18:41	7440-48-4	
Copper	**489**	mg/kg	54.9	2000	08/01/11 15:14	08/04/11 18:45	7440-50-8	
Iron	**8270**	mg/kg	54.9	20	08/01/11 15:14	08/04/11 18:41	7439-89-6	
Lead	**21.0**	mg/kg	0.11	20	08/01/11 15:14	08/04/11 18:41	7439-92-1	
Manganese	**460**	mg/kg	54.9	2000	08/01/11 15:14	08/04/11 18:45	7439-96-5	
Nickel	**5.3**	mg/kg	0.55	20	08/01/11 15:14	08/04/11 18:41	7440-02-0	
Zinc	**131**	mg/kg	5.5	20	08/01/11 15:14	08/04/11 18:41	7440-66-6	
7471 Mercury	Analytical Method: EPA 7471 Preparation Method: EPA 7471							
Mercury	**0.12**	mg/kg	0.022	1	07/28/11 16:35	07/31/11 09:29	7439-97-6	M1
Dry Weight	Analytical Method: % Moisture							
Percent Moisture	**16.4**	%	0.10	1		07/25/11 00:00		
Sobek Acid Base Potential	Analytical Method: Modified Sobek 3.2							
Neutralization Potential	**1.2**	tons/1000	0.50	1		08/01/11 00:00		
Sobek Extractable Sulfur	Analytical Method: Modified Sobek 3.2							
Sulfur, HCl Extractable	**<0.050**	% (w/w)	0.050	1		08/09/11 08:00		
Sulfur, HNO3 Extractable	**<0.050**	% (w/w)	0.050	1		08/09/11 08:00		
Sulfur, Hot Water Extractable	**<0.050**	% (w/w)	0.050	1		08/09/11 08:00		
Sulfur, Residual	**<0.050**	% (w/w)	0.050	1		08/09/11 08:00		
Total Sulfur	**<0.050**	% (w/w)	0.050	1		08/09/11 08:00		
Sobek Calculations	Analytical Method: Modified Sobek 3.2							
Acid/Base Potential	**1.2**	tons/1000		1		08/01/11 00:00		
Acid Potential	**<4.3**	tons/1000	4.3	1		08/01/11 00:00		
Lime Requirement	**<5.4**	tons/1000	5.4	1		08/01/11 00:00		
SMP Lime Requirement	**3.9**	tons/1000	0.0	1		08/01/11 00:00		
Sobek SMP Buffer pH	Analytical Method: Modified Sobek 3.2							
SMP Buffer pH	**6.4**	Std. Units	0.10	1		07/29/11 13:24		

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ANALYTICAL RESULTS

Project: Black Pine Mine REV
Pace Project No.: 10163634

Sample: BP-CMN-SS-09-04 **Lab ID: 10163634010** Collected: 07/14/11 14:45 Received: 07/16/11 20:03 Matrix: Solid

Results reported on a "dry-weight" basis

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
6010 MET ICP, MDEQ Potassium	Analytical Method: CLPICPAES Preparation Method: ASA 13-3.5.2.2							
Potassium	**<125**	mg/kg	125	5	08/01/11 17:34	08/01/11 19:11	7440-09-7	
Cation Exchange Capacity	Analytical Method: EPA 9081							
Cation Exchange Capacity	**16.3**	meq/100g	1.0	10	08/03/11 14:00	08/05/11 13:54		
6020 MET ICPMS	Analytical Method: EPA 6020 Preparation Method: EPA 3050							
Antimony	**0.67**	mg/kg	0.57	20	08/01/11 15:14	08/04/11 18:50	7440-36-0	
Arsenic	**8.1**	mg/kg	0.57	20	08/01/11 15:14	08/04/11 18:50	7440-38-2	
Barium	**185**	mg/kg	0.34	20	08/01/11 15:14	08/04/11 18:50	7440-39-3	
Cadmium	**1.7**	mg/kg	0.091	20	08/01/11 15:14	08/04/11 18:50	7440-43-9	
Chromium	**12.1**	mg/kg	0.57	20	08/01/11 15:14	08/04/11 18:50	7440-47-3	
Cobalt	**11.2**	mg/kg	0.57	20	08/01/11 15:14	08/04/11 18:50	7440-48-4	
Copper	**58.4**	mg/kg	0.57	20	08/01/11 15:14	08/04/11 18:50	7440-50-8	
Iron	**14400**	mg/kg	56.6	20	08/01/11 15:14	08/04/11 18:50	7439-89-6	
Lead	**20.4**	mg/kg	0.11	20	08/01/11 15:14	08/04/11 18:50	7439-92-1	
Manganese	**243**	mg/kg	0.57	20	08/01/11 15:14	08/04/11 18:50	7439-96-5	
Nickel	**7.1**	mg/kg	0.57	20	08/01/11 15:14	08/04/11 18:50	7440-02-0	
Zinc	**129**	mg/kg	5.7	20	08/01/11 15:14	08/04/11 18:50	7440-66-6	
7471 Mercury	Analytical Method: EPA 7471 Preparation Method: EPA 7471							
Mercury	**61.3**	mg/kg	5.5	250	07/28/11 16:35	07/31/11 09:48	7439-97-6	
Dry Weight	Analytical Method: % Moisture							
Percent Moisture	**11.6**	%	0.10	1		07/25/11 00:00		
353.2 Nitrate + Nitrite pres.	Analytical Method: ASA 33-3.2/EPA 353.2							
Available Nitrate	**<5.0**	mg/kg	5.0	1		07/26/11 18:07		
Coarse	Analytical Method: ASTM D421							
Coarse Fragment	**22.1**	% (w/w)	0.10	1		07/26/11 12:15		
Organic Matter MT ASA 29	Analytical Method: ASA 29-3.5.2							
Organic Matter	**<0.10**	% (w/w)	0.10	1		07/21/11 16:50		
ASA 10-3.2 pH	Analytical Method: ASA 10-3.2							
pH, Saturated Paste	**6.1**	Std. Units	0.10	1		07/27/11 17:36		
SM4500P-E, Total Phosphorus	Analytical Method: ASA 24-5.4/SM4500							
Available Phosphorus	**3.2**	mg/kg	1.0	1		07/25/11 14:47	7723-14-0	
Sobek Acid Base Potential	Analytical Method: Modified Sobek 3.2							
Neutralization Potential	**3.7**	tons/1000	0.50	1		07/29/11 00:00		

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ANALYTICAL RESULTS

Project: Black Pine Mine REV
Pace Project No.: 10163634

Sample: BP-CMN-SS-09-04 **Lab ID: 10163634010** Collected: 07/14/11 14:45 Received: 07/16/11 20:03 Matrix: Solid

Results reported on a "dry-weight" basis

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
Sobek Extractable Sulfur	Analytical Method: Modified Sobek 3.2							
Sulfur, HCl Extractable	**<0.050**	% (w/w)	0.050	1		07/26/11 15:00		
Sulfur, HNO3 Extractable	**<0.050**	% (w/w)	0.050	1		07/26/11 15:00		
Sulfur, Hot Water Extractable	**<0.050**	% (w/w)	0.050	1		07/26/11 15:00		
Sulfur, Residual	**<0.050**	% (w/w)	0.050	1		07/26/11 15:00		
Total Sulfur	**<0.050**	% (w/w)	0.050	1		07/26/11 15:00		
Sobek Calculations	Analytical Method: Modified Sobek 3.2							
Acid/Base Potential	**3.7**	tons/1000		1		07/26/11 15:00		
Acid Potential	**<4.3**	tons/1000	4.3	1		07/26/11 15:00		
Lime Requirement	**<5.4**	tons/1000	5.4	1		07/26/11 15:00		
SMP Lime Requirement	**0.3**	tons/1000	0.0	1		07/26/11 15:00		
Sobek SMP Buffer pH	Analytical Method: Modified Sobek 3.2							
SMP Buffer pH	**6.9**	Std. Units	0.10	1		07/26/11 15:00		
ASA10-3.3 Specific Conductance	Analytical Method: ASA 10-3.3							
Sp.Conductance Saturated Paste	**1.0**	mmhos/cm	0.010	1		07/27/11 12:56		

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QUALITY CONTROL DATA

Project: Black Pine Mine REV
Pace Project No.: 10163634

QC Batch: MPRP/27469 Analysis Method: CLPICPAES
QC Batch Method: ASA 13-3.5.2.2 Analysis Description: CLPICPAES MET
Associated Lab Samples: 10163634006, 10163634008, 10163634010

METHOD BLANK: 1024549 Matrix: Solid
Associated Lab Samples: 10163634006, 10163634008, 10163634010

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Potassium	mg/kg	<124	124	08/01/11 17:43	

LABORATORY CONTROL SAMPLE & LCSD: 1024550 1024551

Parameter	Units	Spike Conc.	LCS Result	LCSD Result	LCS % Rec	LCSD % Rec	% Rec Limits	RPD	Max RPD	Qualifiers
Potassium	mg/kg	156	177	210	114	135	80-120	17	20	

SAMPLE DUPLICATE: 1024552

Parameter	Units	10163634008 Result	Dup Result	RPD	Max RPD	Qualifiers
Potassium	mg/kg	<116	<125		30	

SAMPLE DUPLICATE: 1024553

Parameter	Units	10163644010 Result	Dup Result	RPD	Max RPD	Qualifiers
Potassium	mg/kg	<123	<125		30	

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QUALITY CONTROL DATA

Project: Black Pine Mine REV
Pace Project No.: 10163634

QC Batch: ICP/14917 Analysis Method: EPA 9081
QC Batch Method: EPA 9081 Analysis Description: Cation Exchange Capacity
Associated Lab Samples: 10163634006, 10163634008, 10163634010

METHOD BLANK: 853094 Matrix: Solid
Associated Lab Samples: 10163634006, 10163634008, 10163634010

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Cation Exchange Capacity	meq/100g	<1.0	1.0	08/05/11 13:25	

LABORATORY CONTROL SAMPLE: 853095

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Cation Exchange Capacity	meq/100g	53.2	53.1	100	62-138	

SAMPLE DUPLICATE: 853096

Parameter	Units	10163645001 Result	Dup Result	RPD	Max RPD	Qualifiers
Cation Exchange Capacity	meq/100g	14.7	14.1	4	47	

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QUALITY CONTROL DATA

Project: Black Pine Mine REV
Pace Project No.: 10163634

QC Batch: MPRP/27167 Analysis Method: EPA 6020
QC Batch Method: EPA 3050 Analysis Description: 6020 MET
Associated Lab Samples: 10163634001, 10163634002, 10163634003, 10163634004, 10163634005, 10163634006, 10163634007, 10163634008, 10163634009, 10163634010

METHOD BLANK: 1014853 Matrix: Solid
Associated Lab Samples: 10163634001, 10163634002, 10163634003, 10163634004, 10163634005, 10163634006, 10163634007, 10163634008, 10163634009, 10163634010

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Antimony	mg/kg	<0.49	0.49	08/04/11 03:04	
Arsenic	mg/kg	<0.49	0.49	08/04/11 03:04	
Barium	mg/kg	<0.29	0.29	08/04/11 03:04	
Cadmium	mg/kg	<0.078	0.078	08/04/11 03:04	
Chromium	mg/kg	<0.49	0.49	08/04/11 03:04	
Cobalt	mg/kg	<0.49	0.49	08/04/11 03:04	
Copper	mg/kg	<0.49	0.49	08/04/11 03:04	
Iron	mg/kg	<49.0	49.0	08/04/11 03:04	
Lead	mg/kg	<0.098	0.098	08/04/11 03:04	
Manganese	mg/kg	<0.49	0.49	08/04/11 03:04	
Nickel	mg/kg	<0.49	0.49	08/04/11 03:04	
Zinc	mg/kg	<4.9	4.9	08/04/11 03:04	

LABORATORY CONTROL SAMPLE: 1014854

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Antimony	mg/kg	20	18.2	91	75-125	
Arsenic	mg/kg	20	18.3	92	75-125	
Barium	mg/kg	20	18.1	90	75-125	
Cadmium	mg/kg	20	18.4	92	75-125	
Chromium	mg/kg	20	18.8	94	75-125	
Cobalt	mg/kg	20	18.7	94	75-125	
Copper	mg/kg	20	18.9	94	75-125	
Iron	mg/kg	250	233	93	75-125	
Lead	mg/kg	20	18.8	94	75-125	
Manganese	mg/kg	20	18.4	92	75-125	
Nickel	mg/kg	20	18.8	94	75-125	
Zinc	mg/kg	20	18.8	94	75-125	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 1014855 1014856

Parameter	Units	10163483007 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Antimony	mg/kg	219	21.7	21.7	178	148	-190	-328	75-125	18	20	M6
Arsenic	mg/kg	118	21.7	21.7	202	156	386	173	75-125	26	20	D6,M6
Barium	mg/kg	49.3	21.7	21.7	115	113	302	293	75-125	2	20	M6
Cadmium	mg/kg	0.12	21.7	21.7	54.2	53.7	249	246	75-125	.9	20	M6
Chromium	mg/kg	5.4	21.7	21.7	61.4	62.0	258	260	75-125	1	20	M6

REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL DATA

Project: Black Pine Mine REV
Pace Project No.: 10163634

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 1014855 1014856

Parameter	Units	10163483007 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Cobalt	mg/kg	2.5	21.7	21.7	57.8	56.1	254	246	75-125	3	20	
Copper	mg/kg	31.3	21.7	21.7	88.5	89.2	263	266	75-125	.8	20	M6
Iron	mg/kg	17000	272	272	15300	15900	-622	-408	75-125	4	20	M6
Lead	mg/kg	162	21.7	21.7	230	269	311	490	75-125	16	20	M6
Manganese	mg/kg	67.6	21.7	21.7	169	115	467	220	75-125	38	20	D6,M6
Nickel	mg/kg	4.9	21.7	21.7	57.6	57.7	243	243	75-125	.04	20	M6
Zinc	mg/kg	18.6	21.7	21.7	76.5	80.9	266	287	75-125	6	20	M6

MATRIX SPIKE SAMPLE: 1014857

Parameter	Units	10163634007 Result	Spike Conc.	MS Result	MS % Rec	% Rec Limits	Qualifiers
Antimony	mg/kg	3.3	19.6	41.0	192	75-125	M6
Arsenic	mg/kg	14.4	19.6	69.2	279	75-125	M6
Barium	mg/kg	64.7	19.6	230	841	75-125	M6
Cadmium	mg/kg	1.6	19.6	59.5	295	75-125	M6
Chromium	mg/kg	7.6	19.6	69.5	316	75-125	M6
Cobalt	mg/kg	8.2	19.6	72.2	326	75-125	
Copper	mg/kg	220	19.6	263	220	75-125	M6
Iron	mg/kg	11000	245	13400	1010	75-125	M6
Lead	mg/kg	24.4	19.6	96.1	365	75-125	M6
Manganese	mg/kg	419	19.6	838	2130	75-125	M6
Nickel	mg/kg	4.8	19.6	62.7	295	75-125	M6
Zinc	mg/kg	101	19.6	169	345	75-125	M6

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QUALITY CONTROL DATA

Project: Black Pine Mine REV
Pace Project No.: 10163634

QC Batch: MERP/5649 Analysis Method: EPA 7471
QC Batch Method: EPA 7471 Analysis Description: 7471 Mercury
Associated Lab Samples: 10163634001, 10163634002, 10163634003, 10163634004, 10163634005, 10163634006, 10163634007, 10163634008

METHOD BLANK: 1016602 Matrix: Solid
Associated Lab Samples: 10163634001, 10163634002, 10163634003, 10163634004, 10163634005, 10163634006, 10163634007, 10163634008

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Mercury	mg/kg	<0.018	0.018	08/01/11 15:23	

LABORATORY CONTROL SAMPLE: 1016603

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Mercury	mg/kg	.45	0.47	104	80-120	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 1016604 1016605

Parameter	Units	10163633001 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Mercury	mg/kg	7.0	.46	.51	5.2	5.7	-399	-259	80-120	9	20	M6

MATRIX SPIKE SAMPLE: 1016606

Parameter	Units	10163634008 Result	Spike Conc.	MS Result	MS % Rec	% Rec Limits	Qualifiers
Mercury	mg/kg	<0.021	.56	<0.022	3	80-120	M1

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QUALITY CONTROL DATA

Project: Black Pine Mine REV
Pace Project No.: 10163634

QC Batch: MERP/5650 Analysis Method: EPA 7471
QC Batch Method: EPA 7471 Analysis Description: 7471 Mercury
Associated Lab Samples: 10163634009, 10163634010

METHOD BLANK: 1016607 Matrix: Solid
Associated Lab Samples: 10163634009, 10163634010

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Mercury	mg/kg	<0.020	0.020	07/31/11 09:25	

LABORATORY CONTROL SAMPLE: 1016608

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Mercury	mg/kg	.44	0.45	103	80-120	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 1016609 1016610

Parameter	Units	10163634009 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Mercury	mg/kg	0.12	.45	.54	0.23	0.31	25	35	80-120	27	20	D6,M1

MATRIX SPIKE SAMPLE: 1016611

Parameter	Units	10163643009 Result	Spike Conc.	MS Result	MS % Rec	% Rec Limits	Qualifiers
Mercury	mg/kg	137	.6	137	14	80-120	M6

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QUALITY CONTROL DATA

Project: Black Pine Mine REV
Pace Project No.: 10163634

QC Batch: MPRP/27290 Analysis Method: % Moisture
QC Batch Method: % Moisture Analysis Description: Dry Weight/Percent Moisture
Associated Lab Samples: 10163634001, 10163634002, 10163634003, 10163634004, 10163634005

SAMPLE DUPLICATE: 1019295

Parameter	Units	10164251001 Result	Dup Result	RPD	Max RPD	Qualifiers
Percent Moisture	%	3.9	4.4	13	30	

SAMPLE DUPLICATE: 1019296

Parameter	Units	10163634005 Result	Dup Result	RPD	Max RPD	Qualifiers
Percent Moisture	%	8.6	9.4	9	30	

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QUALITY CONTROL DATA

Project: Black Pine Mine REV
Pace Project No.: 10163634

QC Batch: MPRP/27293 Analysis Method: % Moisture
QC Batch Method: % Moisture Analysis Description: Dry Weight/Percent Moisture
Associated Lab Samples: 10163634006, 10163634007, 10163634008, 10163634009, 10163634010

SAMPLE DUPLICATE: 1019403

Parameter	Units	10163634006 Result	Dup Result	RPD	Max RPD	Qualifiers
Percent Moisture	%	10.3	11.1	7	30	

SAMPLE DUPLICATE: 1019404

Parameter	Units	10163643008 Result	Dup Result	RPD	Max RPD	Qualifiers
Percent Moisture	%	18.6	18.3	2	30	

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QUALITY CONTROL DATA

Project: Black Pine Mine REV
Pace Project No.: 10163634

QC Batch: MT/6442 Analysis Method: ASA 33-3.2/EPA 353.2
QC Batch Method: ASA 33-3.2/EPA 353.2 Analysis Description: 353.2 Nitrate + Nitrite
Associated Lab Samples: 10163634006, 10163634008, 10163634010

METHOD BLANK: 1016641 Matrix: Solid
Associated Lab Samples: 10163634006, 10163634008, 10163634010

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Available Nitrate	mg/kg	<5.0	5.0	07/26/11 17:37	

LABORATORY CONTROL SAMPLE: 1016642

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Available Nitrate	mg/kg	25	24.0	96	76-124	

SAMPLE DUPLICATE: 1016643

Parameter	Units	10163246004 Result	Dup Result	RPD	Max RPD	Qualifiers
Available Nitrate	mg/kg	<5.0	<5.0		30	

SAMPLE DUPLICATE: 1016644

Parameter	Units	10163644008 Result	Dup Result	RPD	Max RPD	Qualifiers
Available Nitrate	mg/kg	<5.0	<5.0		30	

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QUALITY CONTROL DATA

Project: Black Pine Mine REV
Pace Project No.: 10163634

QC Batch: MT/6438 Analysis Method: ASA 29-3.5.2
QC Batch Method: ASA 29-3.5.2 Analysis Description: Organic Matter ASA 29
Associated Lab Samples: 10163634006, 10163634008, 10163634010

METHOD BLANK: 1016290 Matrix: Solid
Associated Lab Samples: 10163634006, 10163634008, 10163634010

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Organic Matter	% (w/w)	<0.10	0.10	07/21/11 16:50	

LABORATORY CONTROL SAMPLE: 1016291

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Organic Matter	% (w/w)	3.1	3.3	107	69-131	

SAMPLE DUPLICATE: 1016293

Parameter	Units	10163634008 Result	Dup Result	RPD	Max RPD	Qualifiers
Organic Matter	% (w/w)	0.13	<0.10		30	

SAMPLE DUPLICATE: 1018103

Parameter	Units	10163246002 Result	Dup Result	RPD	Max RPD	Qualifiers
Organic Matter	% (w/w)	3.3	3.2	2	30	

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QUALITY CONTROL DATA

Project: Black Pine Mine REV
Pace Project No.: 10163634

QC Batch: MT/6426 Analysis Method: ASA 10-3.2
QC Batch Method: ASA 10-3.2 Analysis Description: ASA 10-3.2 pH saturated paste
Associated Lab Samples: 10163634006, 10163634008, 10163634010

SAMPLE DUPLICATE: 1017424

Parameter	Units	10163246004 Result	Dup Result	RPD	Max RPD	Qualifiers
pH, Saturated Paste	Std. Units	7.0	6.9	.7	20	

SAMPLE DUPLICATE: 1017425

Parameter	Units	10163645001 Result	Dup Result	RPD	Max RPD	Qualifiers
pH, Saturated Paste	Std. Units	6.9	6.7	2	20	

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QUALITY CONTROL DATA

Project: Black Pine Mine REV
Pace Project No.: 10163634

QC Batch: MT/6443 Analysis Method: ASA 24-5.4/SM4500
QC Batch Method: ASA 24-5.4/SM4500 Analysis Description: SM4500P-E, Total Phosphorus
Associated Lab Samples: 10163634006, 10163634008, 10163634010

METHOD BLANK: 1016645 Matrix: Solid
Associated Lab Samples: 10163634006, 10163634008, 10163634010

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Available Phosphorus	mg/kg	<1.0	1.0	07/25/11 14:30	

LABORATORY CONTROL SAMPLE: 1016646

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Available Phosphorus	mg/kg	10	8.0	80	56-144	

SAMPLE DUPLICATE: 1016647

Parameter	Units	10163246004 Result	Dup Result	RPD	Max RPD	Qualifiers
Available Phosphorus	mg/kg	2.8	3.1	9	30	

SAMPLE DUPLICATE: 1016648

Parameter	Units	10163644006 Result	Dup Result	RPD	Max RPD	Qualifiers
Available Phosphorus	mg/kg	1.4	1.4	3	30	

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QUALITY CONTROL DATA

Project: Black Pine Mine REV
Pace Project No.: 10163634

QC Batch: MT/6480 Analysis Method: Modified Sobek 3.2
QC Batch Method: Modified Sobek 3.2 Analysis Description: Sobek Acid Base Potential
Associated Lab Samples: 10163634006, 10163634008, 10163634010

METHOD BLANK: 1019986 Matrix: Solid
Associated Lab Samples: 10163634006, 10163634008, 10163634010

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Neutralization Potential	tons/1000	<0.5	0.50	07/29/11 00:00	

SAMPLE DUPLICATE: 1019631

Parameter	Units	10163606002 Result	Dup Result	RPD	Max RPD	Qualifiers
Neutralization Potential	tons/1000	1.5	1.7			

SAMPLE DUPLICATE: 1019632

Parameter	Units	10163246007 Result	Dup Result	RPD	Max RPD	Qualifiers
Neutralization Potential	tons/1000	4.0	5.7			

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QUALITY CONTROL DATA

Project: Black Pine Mine REV
Pace Project No.: 10163634

QC Batch: MT/6497 Analysis Method: Modified Sobek 3.2
QC Batch Method: Modified Sobek 3.2 Analysis Description: Sobek Acid Base Potential
Associated Lab Samples: 10163634001, 10163634002, 10163634003, 10163634005, 10163634007, 10163634009

METHOD BLANK: 1020551 Matrix: Solid
Associated Lab Samples: 10163634001, 10163634002, 10163634003, 10163634005, 10163634007, 10163634009

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Neutralization Potential	tons/1000	<0.5	0.50	08/01/11 00:00	

SAMPLE DUPLICATE: 1020552

Parameter	Units	10163634001 Result	Dup Result	RPD	Max RPD	Qualifiers
Neutralization Potential	tons/1000	0.73	2.2			

SAMPLE DUPLICATE: 1024994

Parameter	Units	10163640008 Result	Dup Result	RPD	Max RPD	Qualifiers
Neutralization Potential	tons/1000	2.4	5.6			

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QUALITY CONTROL DATA

Project: Black Pine Mine REV
Pace Project No.: 10163634

QC Batch: MT/6452 Analysis Method: Modified Sobek 3.2
QC Batch Method: Modified Sobek 3.2 Analysis Description: Sobek Extractable Sulfur
Associated Lab Samples: 10163634006, 10163634008, 10163634010

METHOD BLANK: 1017262 Matrix: Solid
Associated Lab Samples: 10163634006, 10163634008, 10163634010

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Total Sulfur	% (w/w)	<0.050	0.050	07/29/11 16:11	

SAMPLE DUPLICATE: 1017264

Parameter	Units	10163606002 Result	Dup Result	RPD	Max RPD	Qualifiers
Total Sulfur	% (w/w)	0.228	0.211	8		

SAMPLE DUPLICATE: 1017265

Parameter	Units	10163246007 Result	Dup Result	RPD	Max RPD	Qualifiers
Total Sulfur	% (w/w)	<0.050	<0.050			

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QUALITY CONTROL DATA

Project: Black Pine Mine REV
Pace Project No.: 10163634

QC Batch: MT/6488 Analysis Method: Modified Sobek 3.2
QC Batch Method: Modified Sobek 3.2 Analysis Description: Sobek Extractable Sulfur
Associated Lab Samples: 10163634001, 10163634002, 10163634003, 10163634005, 10163634007, 10163634009

METHOD BLANK: 1019974 Matrix: Solid
Associated Lab Samples: 10163634001, 10163634002, 10163634003, 10163634005, 10163634007, 10163634009

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Total Sulfur	% (w/w)	<0.050	0.050	08/08/11 14:36	

SAMPLE DUPLICATE: 1019976

Parameter	Units	10163634001 Result	Dup Result	RPD	Max RPD	Qualifiers
Total Sulfur	% (w/w)	<0.050	<0.050			

SAMPLE DUPLICATE: 1019977

Parameter	Units	10163643005 Result	Dup Result	RPD	Max RPD	Qualifiers
Total Sulfur	% (w/w)	0.0605	0.0697	14		

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QUALITY CONTROL DATA

Project: Black Pine Mine REV
Pace Project No.: 10163634

QC Batch: MT/6481 Analysis Method: Modified Sobek 3.2
QC Batch Method: Modified Sobek 3.2 Analysis Description: Sobek SMP Buffer pH
Associated Lab Samples: 10163634006, 10163634008, 10163634010

LABORATORY CONTROL SAMPLE: 1019634

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
SMP Buffer pH	Std. Units		7.0			

SAMPLE DUPLICATE: 1019635

Parameter	Units	10163606002 Result	Dup Result	RPD	Max RPD	Qualifiers
SMP Buffer pH	Std. Units	6.6	6.6	0	20	

SAMPLE DUPLICATE: 1019636

Parameter	Units	10163246007 Result	Dup Result	RPD	Max RPD	Qualifiers
SMP Buffer pH	Std. Units	6.8	6.8	.7	20	

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QUALITY CONTROL DATA

Project: Black Pine Mine REV
Pace Project No.: 10163634

QC Batch: MT/6543 Analysis Method: Modified Sobek 3.2
QC Batch Method: Modified Sobek 3.2 Analysis Description: Sobek SMP Buffer pH
Associated Lab Samples: 10163634001, 10163634002, 10163634003, 10163634005, 10163634007, 10163634009

SAMPLE DUPLICATE: 1022818

Parameter	Units	10163634001 Result	Dup Result	RPD	Max RPD	Qualifiers
SMP Buffer pH	Std. Units	7.3	7.2	.3	20	

SAMPLE DUPLICATE: 1026468

Parameter	Units	10163643005 Result	Dup Result	RPD	Max RPD	Qualifiers
SMP Buffer pH	Std. Units	7.1	7.1	.3	20	

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QUALITY CONTROL DATA

Project: Black Pine Mine REV
Pace Project No.: 10163634

QC Batch: MT/6547
QC Batch Method: ASA 10-3.3
Analysis Method: ASA 10-3.3
Analysis Description: ASA 10-3.3 Specific Conductance
Associated Lab Samples: 10163634010

METHOD BLANK: 1022940 Matrix: Water
Associated Lab Samples: 10163634010

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Sp.Conductance Saturated Paste	mmhos/cm	<0.010	0.010	07/27/11 12:56	

LABORATORY CONTROL SAMPLE: 1022941

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Sp.Conductance Saturated Paste	mmhos/cm	.85	0.80	94	53-147	

SAMPLE DUPLICATE: 1022942

Parameter	Units	10163246004 Result	Dup Result	RPD	Max RPD	Qualifiers
Sp.Conductance Saturated Paste	mmhos/cm	0.091	0.088	3	20	

SAMPLE DUPLICATE: 1022943

Parameter	Units	10163645001 Result	Dup Result	RPD	Max RPD	Qualifiers
Sp.Conductance Saturated Paste	mmhos/cm	0.20	0.14	33	20	D6

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QUALITY CONTROL DATA

Project: Black Pine Mine REV
Pace Project No.: 10163634

QC Batch: MT/6575 Analysis Method: ASA 10-3.3
QC Batch Method: ASA 10-3.3 Analysis Description: ASA 10-3.3 Specific Conductance
Associated Lab Samples: 10163634006, 10163634008

METHOD BLANK: 1025145 Matrix: Water
Associated Lab Samples: 10163634006, 10163634008

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Sp.Conductance Saturated Paste	mmhos/cm	<0.010	0.010	08/03/11 19:49	

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QUALIFIERS

Project: Black Pine Mine REV
Pace Project No.: 10163634

DEFINITIONS

DF - Dilution Factor, if reported, represents the factor applied to the reported data due to changes in sample preparation, dilution of the sample aliquot, or moisture content.

ND - Not Detected at or above adjusted reporting limit.

J - Estimated concentration above the adjusted method detection limit and below the adjusted reporting limit.

MDL - Adjusted Method Detection Limit.

S - Surrogate

1,2-Diphenylhydrazine (8270 listed analyte) decomposes to Azobenzene.

Consistent with EPA guidelines, unrounded data are displayed and have been used to calculate % recovery and RPD values.

LCS(D) - Laboratory Control Sample (Duplicate)

MS(D) - Matrix Spike (Duplicate)

DUP - Sample Duplicate

RPD - Relative Percent Difference

NC - Not Calculable.

SG - Silica Gel - Clean-Up

U - Indicates the compound was analyzed for, but not detected.

N-Nitrosodiphenylamine decomposes and cannot be separated from Diphenylamine using Method 8270. The result reported for each analyte is a combined concentration.

LABORATORIES

PASI-K	Pace Analytical Services - Kansas City
PASI-M	Pace Analytical Services - Minneapolis
PASI-MT	Pace Analytical Services - Montana

ANALYTE QUALIFIERS

D6	The relative percent difference (RPD) between the sample and sample duplicate exceeded laboratory control limits.
M1	Matrix spike recovery exceeded QC limits. Batch accepted based on laboratory control sample (LCS) recovery.
M6	Matrix spike and Matrix spike duplicate recovery not evaluated against control limits due to sample dilution.

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QUALITY CONTROL DATA CROSS REFERENCE TABLE

Project: Black Pine Mine REV
Pace Project No.: 10163634

Lab ID	Sample ID	QC Batch Method	QC Batch	Analytical Method	Analytical Batch
10163634006	**BP-CMN-SS-07-06**	ASA 13-3.5.2.2	MPRP/27469	CLPICPAES	ICP/11638
10163634008	**BP-CMN-SS-08-03**	ASA 13-3.5.2.2	MPRP/27469	CLPICPAES	ICP/11638
10163634010	**BP-CMN-SS-09-04**	ASA 13-3.5.2.2	MPRP/27469	CLPICPAES	ICP/11638
10163634006	**BP-CMN-SS-07-06**	EPA 9081	ICP/14917	EPA 9081	ICP/13002
10163634008	**BP-CMN-SS-08-03**	EPA 9081	ICP/14917	EPA 9081	ICP/13002
10163634010	**BP-CMN-SS-09-04**	EPA 9081	ICP/14917	EPA 9081	ICP/13002
10163634001	**BP-CMN-SS-04-00**	EPA 3050	MPRP/27167	EPA 6020	ICPM/11153
10163634002	**BP-CMN-RS-04-02**	EPA 3050	MPRP/27167	EPA 6020	ICPM/11153
10163634003	**BP-CMN-RS-04-05**	EPA 3050	MPRP/27167	EPA 6020	ICPM/11153
10163634004	**BP-CMN-SS-04-08**	EPA 3050	MPRP/27167	EPA 6020	ICPM/11153
10163634005	**BP-CMN-SS-07-00**	EPA 3050	MPRP/27167	EPA 6020	ICPM/11153
10163634006	**BP-CMN-SS-07-06**	EPA 3050	MPRP/27167	EPA 6020	ICPM/11153
10163634007	**BP-CMN-SS-08-00**	EPA 3050	MPRP/27167	EPA 6020	ICPM/11153
10163634008	**BP-CMN-SS-08-03**	EPA 3050	MPRP/27167	EPA 6020	ICPM/11153
10163634009	**BP-CMN-SS-09-00**	EPA 3050	MPRP/27167	EPA 6020	ICPM/11153
10163634010	**BP-CMN-SS-09-04**	EPA 3050	MPRP/27167	EPA 6020	ICPM/11153
10163634001	**BP-CMN-SS-04-00**	EPA 7471	MERP/5649	EPA 7471	MERC/6495
10163634002	**BP-CMN-RS-04-02**	EPA 7471	MERP/5649	EPA 7471	MERC/6495
10163634003	**BP-CMN-RS-04-05**	EPA 7471	MERP/5649	EPA 7471	MERC/6495
10163634004	**BP-CMN-SS-04-08**	EPA 7471	MERP/5649	EPA 7471	MERC/6495
10163634005	**BP-CMN-SS-07-00**	EPA 7471	MERP/5649	EPA 7471	MERC/6495
10163634006	**BP-CMN-SS-07-06**	EPA 7471	MERP/5649	EPA 7471	MERC/6495
10163634007	**BP-CMN-SS-08-00**	EPA 7471	MERP/5649	EPA 7471	MERC/6495
10163634008	**BP-CMN-SS-08-03**	EPA 7471	MERP/5649	EPA 7471	MERC/6495
10163634009	**BP-CMN-SS-09-00**	EPA 7471	MERP/5650	EPA 7471	MERC/6493
10163634010	**BP-CMN-SS-09-04**	EPA 7471	MERP/5650	EPA 7471	MERC/6493
10163634001	**BP-CMN-SS-04-00**	% Moisture	MPRP/27290		
10163634002	**BP-CMN-RS-04-02**	% Moisture	MPRP/27290		
10163634003	**BP-CMN-RS-04-05**	% Moisture	MPRP/27290		
10163634004	**BP-CMN-SS-04-08**	% Moisture	MPRP/27290		
10163634005	**BP-CMN-SS-07-00**	% Moisture	MPRP/27290		
10163634006	**BP-CMN-SS-07-06**	% Moisture	MPRP/27293		
10163634007	**BP-CMN-SS-08-00**	% Moisture	MPRP/27293		
10163634008	**BP-CMN-SS-08-03**	% Moisture	MPRP/27293		
10163634009	**BP-CMN-SS-09-00**	% Moisture	MPRP/27293		
10163634010	**BP-CMN-SS-09-04**	% Moisture	MPRP/27293		
10163634006	**BP-CMN-SS-07-06**	ASA 33-3.2/EPA 353.2	MT/6442		
10163634008	**BP-CMN-SS-08-03**	ASA 33-3.2/EPA 353.2	MT/6442		
10163634010	**BP-CMN-SS-09-04**	ASA 33-3.2/EPA 353.2	MT/6442		
10163634006	**BP-CMN-SS-07-06**	ASTM D421	MT/6412		
10163634008	**BP-CMN-SS-08-03**	ASTM D421	MT/6412		
10163634010	**BP-CMN-SS-09-04**	ASTM D421	MT/6412		
10163634006	**BP-CMN-SS-07-06**	ASA 29-3.5.2	MT/6438		
10163634008	**BP-CMN-SS-08-03**	ASA 29-3.5.2	MT/6438		

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QUALITY CONTROL DATA CROSS REFERENCE TABLE

Project: Black Pine Mine REV
Pace Project No.: 10163634

Lab ID	Sample ID	QC Batch Method	QC Batch	Analytical Method	Analytical Batch
10163634010	**BP-CMN-SS-09-04**	ASA 29-3.5.2	MT/6438		
10163634006	**BP-CMN-SS-07-06**	ASA 10-3.2	MT/6426		
10163634008	**BP-CMN-SS-08-03**	ASA 10-3.2	MT/6426		
10163634010	**BP-CMN-SS-09-04**	ASA 10-3.2	MT/6426		
10163634006	**BP-CMN-SS-07-06**	ASA 24-5.4/SM4500	MT/6443		
10163634008	**BP-CMN-SS-08-03**	ASA 24-5.4/SM4500	MT/6443		
10163634010	**BP-CMN-SS-09-04**	ASA 24-5.4/SM4500	MT/6443		
10163634001	**BP-CMN-SS-04-00**	Modified Sobek 3.2	MT/6497		
10163634002	**BP-CMN-RS-04-02**	Modified Sobek 3.2	MT/6497		
10163634003	**BP-CMN-RS-04-05**	Modified Sobek 3.2	MT/6497		
10163634005	**BP-CMN-SS-07-00**	Modified Sobek 3.2	MT/6497		
10163634006	**BP-CMN-SS-07-06**	Modified Sobek 3.2	MT/6480		
10163634007	**BP-CMN-SS-08-00**	Modified Sobek 3.2	MT/6497		
10163634008	**BP-CMN-SS-08-03**	Modified Sobek 3.2	MT/6480		
10163634009	**BP-CMN-SS-09-00**	Modified Sobek 3.2	MT/6497		
10163634010	**BP-CMN-SS-09-04**	Modified Sobek 3.2	MT/6480		
10163634001	**BP-CMN-SS-04-00**	Modified Sobek 3.2	MT/6488		
10163634002	**BP-CMN-RS-04-02**	Modified Sobek 3.2	MT/6488		
10163634003	**BP-CMN-RS-04-05**	Modified Sobek 3.2	MT/6488		
10163634005	**BP-CMN-SS-07-00**	Modified Sobek 3.2	MT/6488		
10163634006	**BP-CMN-SS-07-06**	Modified Sobek 3.2	MT/6452		
10163634007	**BP-CMN-SS-08-00**	Modified Sobek 3.2	MT/6488		
10163634008	**BP-CMN-SS-08-03**	Modified Sobek 3.2	MT/6452		
10163634009	**BP-CMN-SS-09-00**	Modified Sobek 3.2	MT/6488		
10163634010	**BP-CMN-SS-09-04**	Modified Sobek 3.2	MT/6452		
10163634001	**BP-CMN-SS-04-00**	Modified Sobek 3.2	MT/6501		
10163634002	**BP-CMN-RS-04-02**	Modified Sobek 3.2	MT/6501		
10163634003	**BP-CMN-RS-04-05**	Modified Sobek 3.2	MT/6501		
10163634005	**BP-CMN-SS-07-00**	Modified Sobek 3.2	MT/6501		
10163634006	**BP-CMN-SS-07-06**	Modified Sobek 3.2	MT/6499		
10163634007	**BP-CMN-SS-08-00**	Modified Sobek 3.2	MT/6501		
10163634008	**BP-CMN-SS-08-03**	Modified Sobek 3.2	MT/6499		
10163634009	**BP-CMN-SS-09-00**	Modified Sobek 3.2	MT/6501		
10163634010	**BP-CMN-SS-09-04**	Modified Sobek 3.2	MT/6499		
10163634001	**BP-CMN-SS-04-00**	Modified Sobek 3.2	MT/6543		
10163634002	**BP-CMN-RS-04-02**	Modified Sobek 3.2	MT/6543		
10163634003	**BP-CMN-RS-04-05**	Modified Sobek 3.2	MT/6543		
10163634005	**BP-CMN-SS-07-00**	Modified Sobek 3.2	MT/6543		

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QUALITY CONTROL DATA CROSS REFERENCE TABLE

Project: Black Pine Mine REV
Pace Project No.: 10163634

Lab ID	Sample ID	QC Batch Method	QC Batch	Analytical Method	Analytical Batch
10163634006	**BP-CMN-SS-07-06**	Modified Sobek 3.2	MT/6481		
10163634007	**BP-CMN-SS-08-00**	Modified Sobek 3.2	MT/6543		
10163634008	**BP-CMN-SS-08-03**	Modified Sobek 3.2	MT/6481		
10163634009	**BP-CMN-SS-09-00**	Modified Sobek 3.2	MT/6543		
10163634010	**BP-CMN-SS-09-04**	Modified Sobek 3.2	MT/6481		
10163634006	**BP-CMN-SS-07-06**	ASA 10-3.3	MT/6575		
10163634008	**BP-CMN-SS-08-03**	ASA 10-3.3	MT/6575		
10163634010	**BP-CMN-SS-09-04**	ASA 10-3.3	MT/6547		

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CHAIN-OF-CUSTODY / Analytical Request Document

The Chain-of-Custody is a LEGAL DOCUMENT. All relevant fields must be completed accurately.

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10163634

Page: 1 of 1

1429998

Section A Required Client Information:	Section B Required Project Information:	Section C Invoice Information:
Company: Herrera	Report To: Raven Houck	Attention:
Address:	Copy To: Mark Donner	Company Name: DEQ
		Address:
Email To:	Purchase Order No.:	Pace Quote Reference:
Phone: Fax:	Project Name: Black Pine Mine	Pace Project Manager:
Requested Due Date/TAT:	Project Number:	Pace Profile #:

REGULATORY AGENCY: ☐ NPDES ☐ GROUND WATER ☐ DRINKING WATER ☐ UST ☐ RCRA ☐ OTHER

Site Location STATE:

Section D Required Client Information

SAMPLE ID (A-Z, 0-9 / ,-) Sample IDs MUST BE UNIQUE

Matrix Codes — MATRIX / CODE: Drinking Water DW; Water WT; Waste Water WW; Product P; Soil/Solid SL; Oil OL; Wipe WP; Air AR; Tissue TS; Other OT

Requested Analysis Filtered (Y/N)

ITEM #	SAMPLE ID	MATRIX CODE (see valid codes to left)	SAMPLE TYPE (G=GRAB C=COMP)	COLLECTED COMPOSITE START DATE	COLLECTED COMPOSITE START TIME	COLLECTED COMPOSITE END/GRAB DATE	COLLECTED COMPOSITE END/GRAB TIME	SAMPLE TEMP AT COLLECTION	# OF CONTAINERS	Preservatives: Unpreserved	H_2SO_4	HNO_3	HCl	NaOH	$Na_2S_2O_3$	Methanol	Other	Analysis Test ↓ Y/N	Total Recoverable Metals	ABA	Moisture Content	Agriculture	Residual Chlorine (Y/N)	Pace Project No./ Lab I.D.
1	BP-CMN-SS-04-00	SL	C	7/14/11	1245	"	"		2	X									X	X	X			001
2	BP-CMN-RS-04-02	SL	C	7/14/11	1235				2	X									X	X	X			002
3	BP-CMN-RS-04-05	SL	C	7/14/11	1240				2	X									X	X	X			003
4	BP-CMN-SS-04-08	SL	G	7/14/11	1230				1	X									X	X	X			004
5	BP-CMN-SS-07-00	SL	G	7/14/11	1335				2	X									X	X				005
6	BP-CMN-SS-07-06	SL	G	7/14/11	1340				2	X									X			X		006
7	BP-CMN-SS-08-00	SL	G	7/14/11	1405				2	X									X	X				007
8	BP-CMN-SS-08-03	SL	G	7/14/11	1410				2	X									X			X		008
9	BP-CMN-SS-09-00	SL	G	7/14/11	1430				2	X									X	X				009
10	BP-CMN-SS-09-04	SL	G	7/14/11	1435				2	X									X			X		010
11																								
12																								

ADDITIONAL COMMENTS	RELINQUISHED BY / AFFILIATION	DATE	TIME	ACCEPTED BY / AFFILIATION	DATE	TIME	SAMPLE CONDITIONS
	D Cater/Herrera	7/14/11	1540	Blake Noe	7/14/11	3:43	
	Blake	7/14/11	9:00	Norma C Trimble/Pace	7/14/11	2100	
							3.6 / Y / N / Y

Temp In °C | Received on Ice (Y/N) | Custody Sealed Cooler (Y/N) | Samples Intact (Y/N)

ORIGINAL

SAMPLER NAME AND SIGNATURE

PRINT Name of SAMPLER:

SIGNATURE of SAMPLER: DATE Signed (MM/DD/YY):

*Important Note: By signing this form you are accepting Pace's NET 30 day payment terms and agreeing to late charges of 1.5% per month for any invoices not paid within 30 days.

F-ALL-Q-020rev.07, 15-May-2007

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Sample Condition Upon Receipt

Pace Analytical

Client Name: Herrera Project # 10163634

Courier: ☐ Fed Ex ☐ UPS ☐ USPS ☐ Client ☐ Commercial ☒ Pace Other _____

Tracking #: BV Dropped off

Custody Seal on Cooler/Box Present: ☐ yes ☒ no Seals intact: ☐ yes ☒ no

Packing Material: ☑ Bubble Wrap ☐ Bubble Bags ☐ None ☐ Other _____ Temp Blank: Yes ✓ No _____

Thermometer Used: 1383045 or 135 Type of Ice: (Wet) Blue None ☒ Samples on ice, cooling process has begun

Cooler Temperature: 3.6 ° Biological Tissue is Frozen: Yes (No)

Temp should be above freezing to 6°C

Date and Initials of person examining contents: BV 7/16/11

Comments:

Chain of Custody Present:	☑Yes ☐No ☐N/A	1.
Chain of Custody Filled Out:	☑Yes ☐No ☐N/A	2.
Chain of Custody Relinquished:	☑Yes ☐No ☐N/A	3.
Sampler Name & Signature on COC:	☐Yes ☑No ☐N/A	4.
Samples Arrived within Hold Time:	☑Yes ☐No ☐N/A	5.
Short Hold Time Analysis (<72hr):	☐Yes ☐No ☑N/A	6.
Rush Turn Around Time Requested:	☐Yes ☐No ☑N/A	7.
Sufficient Volume:	☑Yes ☐No ☐N/A	8.
Correct Containers Used:	☑Yes ☐No ☐N/A	9. PB
-Pace Containers Used:	☑Yes ☐No ☐N/A	
Containers Intact:	☑Yes ☐No ☐N/A	10.
Filtered volume received for Dissolved tests	☐Yes ☐No ☑N/A	11.
Sample Labels match COC:	☑Yes ☐No ☐N/A	12.
-Includes date/time/ID/Analysis Matrix: SL		
All containers needing acid/base preservation have been checked. Noncompliance are noted in 13.	☐Yes ☐No ☑N/A	13. ☐ HNO3 ☐ H2SO4 ☐ NaOH ☐ HCl Samp #
All containers needing preservation are found to be in compliance with EPA recommendation.	☐Yes ☐No ☑N/A	
Exceptions: VOA,Coliform, TOC, Oil and Grease, WI-DRO (water)	☐Yes ☑No NP	Initial when completed / Lot # of added preservative
Samples checked for dechlorination:	☐Yes ☐No ☑N/A	14.
Headspace in VOA Vials (>6mm):	☐Yes ☐No ☑N/A	15.
Trip Blank Present:	☐Yes ☐No ☑N/A	16.
Trip Blank Custody Seals Present	☐Yes ☐No ☑N/A	
Pace Trip Blank Lot # (if purchased): N A		

Client Notification/ Resolution: Field Data Required? Y / N

Person Contacted: _____ Date/Time: _____

Comments/ Resolution: _____

Project Manager Review: Sally Kugler **Date:** 7/16/11

Note: Whenever there is a discrepancy affecting North Carolina compliance samples, a copy of this form will be sent to the North Carolina DEHNR Certification Office (i.e out of hold, incorrect preservative, out of temp, incorrect containers)

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(406)254-7226

October 18, 2011

Kevin Houck
Herrera Environmental Consultants
101 East Broadway, Suite 610
Missoula, MT 59802

RE: Project: Black Pine Mine REV
Pace Project No.: 10163635

Dear Kevin Houck:
Enclosed are the analytical results for sample(s) received by the laboratory on July 14, 2011. The results relate only to the samples included in this report.

This report has been revised to add Cobalt and delete Silver.

If you have any questions concerning this report, please feel free to contact me.

Sincerely,

Shawn Davis for
Sally Heinje
sally.heinje@pacelabs.com
Project Manager

Enclosures

cc: Devin Clary, Montana Dept. of Environmental Quality
Mark Donner, Trihydro
Jamie Mongoven, Montana Dept. of Environmental

REPORT OF LABORATORY ANALYSIS

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CERTIFICATIONS

Project: Black Pine Mine REV
Pace Project No.: 10163635

Minnesota Certification IDs

1700 Elm Street SE Suite 200, Minneapolis, MN 55414
A2LA Certification #: 2926.01
Alaska Certification #: UST-078
Alaska Certification #MN00064
Arizona Certification #: AZ-0014
Arkansas Certification #: 88-0680
California Certification #: 01155CA
EPA Region 8 Certification #: Pace
Florida/NELAP Certification #: E87605
Georgia Certification #: 959
Idaho Certification #: MN00064
Illinois Certification #: 200011
Iowa Certification #: 368
Kansas Certification #: E-10167
Louisiana Certification #: 03086
Louisiana Certification #: LA080009
Maine Certification #: 2007029
Maryland Certification #: 322
Michigan DEQ Certification #: 9909
Minnesota Certification #: 027-053-137
Mississippi Certification #: Pace
Montana Certification #: MT CERT0092
Nevada Certification #: MN_00064
Nebraska Certification #: Pace
New Jersey Certification #: MN-002
New Mexico Certification #: Pace
New York Certification #: 11647
North Carolina Certification #: 530
North Dakota Certification #: R-036
North Dakota Certification #: R-036A
Ohio VAP Certification #: CL101
Oklahoma Certification #: D9921
Oklahoma Certification #: 9507
Oregon Certification #: MN200001
Pennsylvania Certification #: 68-00563
Puerto Rico Certification
Tennessee Certification #: 02818
Texas Certification #: T104704192
Washington Certification #: C754
Wisconsin Certification #: 999407970

Montana Certification IDs

602 South 25th Street, Billings, MT 59101
EPA Region 8 Certification #: 8TMS-Q
Idaho Certification #: MT00012
Montana Certification #: MT CERT0040
NVLAP Certification #: 101292-0
Minnesota Dept of Health Certification #: 030-999-442

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SAMPLE SUMMARY

Project: Black Pine Mine REV
Pace Project No.: 10163635

Lab ID	Sample ID	Matrix	Date Collected	Date Received
10163635001	**CMN-SS-15**	Solid	07/13/11 13:45	07/14/11 21:00
10163635002	**CMN-SS-16**	Solid	07/13/11 13:55	07/14/11 21:00
10163635003	**HM-SS-10**	Solid	07/13/11 14:25	07/14/11 21:00
10163635004	**HM-SS-09**	Solid	07/13/11 14:40	07/14/11 21:00
10163635005	**HM-SS-12**	Solid	07/13/11 15:00	07/14/11 21:00
10163635006	**HM-SS-11**	Solid	07/13/11 15:10	07/14/11 21:00
10163635007	**HM-SS-13**	Solid	07/14/11 08:45	07/14/11 21:00
10163635008	**HM-SS-14**	Solid	07/14/11 08:15	07/14/11 21:00
10163635009	**HM-SS-16**	Solid	07/14/11 10:35	07/14/11 21:00

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SAMPLE ANALYTE COUNT

Project: Black Pine Mine REV
Pace Project No.: 10163635

Lab ID	Sample ID	Method	Analysts	Analytes Reported	Laboratory
10163635001	**CMN-SS-15**	EPA 6020	CJS	12	PASI-M
		EPA 7471	TEM	1	PASI-M
		% Moisture	JDL	1	PASI-M
10163635002	**CMN-SS-16**	EPA 6020	CJS	12	PASI-M
		EPA 7471	TEM	1	PASI-M
		% Moisture	JDL	1	PASI-M
10163635003	**HM-SS-10**	EPA 6020	CJS	12	PASI-M
		EPA 7471	TEM	1	PASI-M
		% Moisture	JDL	1	PASI-M
		Modified Sobek 3.2	JH1	1	PASI-MT
		Modified Sobek 3.2	JH1	5	PASI-MT
		Modified Sobek 3.2	JH1	4	PASI-MT
		Modified Sobek 3.2	JH1	1	PASI-MT
10163635004	**HM-SS-09**	EPA 6020	CJS	12	PASI-M
		EPA 7471	TEM	1	PASI-M
		% Moisture	JDL	1	PASI-M
		Modified Sobek 3.2	JH1	1	PASI-MT
		Modified Sobek 3.2	JH1	5	PASI-MT
		Modified Sobek 3.2	JH1	4	PASI-MT
		Modified Sobek 3.2	JH1	1	PASI-MT
10163635005	**HM-SS-12**	EPA 6020	CJS	12	PASI-M
		EPA 7471	TEM	1	PASI-M
		% Moisture	JDL	1	PASI-M
		Modified Sobek 3.2	JH1	1	PASI-MT
		Modified Sobek 3.2	JH1	5	PASI-MT
		Modified Sobek 3.2	JH1	4	PASI-MT
		Modified Sobek 3.2	JH1	1	PASI-MT
10163635006	**HM-SS-11**	EPA 6020	CJS	12	PASI-M
		EPA 7471	TEM	1	PASI-M
		% Moisture	JDL	1	PASI-M
		Modified Sobek 3.2	JH1	1	PASI-MT
		Modified Sobek 3.2	SA1	5	PASI-MT
		Modified Sobek 3.2	JH1	4	PASI-MT
		Modified Sobek 3.2	JH1	1	PASI-MT
10163635007	**HM-SS-13**	EPA 6020	CJS	12	PASI-M
		EPA 7471	TEM	1	PASI-M
		% Moisture	JDL	1	PASI-M

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SAMPLE ANALYTE COUNT

Project: Black Pine Mine REV
Pace Project No.: 10163635

Lab ID	Sample ID	Method	Analysts	Analytes Reported	Laboratory
		Modified Sobek 3.2	JH1	1	PASI-MT
		Modified Sobek 3.2	SA1	5	PASI-MT
		Modified Sobek 3.2	JH1	4	PASI-MT
		Modified Sobek 3.2	JH1	1	PASI-MT
10163635008	**HM-SS-14**	EPA 6020	CJS	12	PASI-M
		EPA 7471	TEM	1	PASI-M
		% Moisture	JDL	1	PASI-M
		Modified Sobek 3.2	JH1	1	PASI-MT
		Modified Sobek 3.2	JH1	5	PASI-MT
		Modified Sobek 3.2	JH1	4	PASI-MT
		Modified Sobek 3.2	JH1	1	PASI-MT
10163635009	**HM-SS-16**	EPA 6020	CJS	12	PASI-M
		EPA 7471	TEM	1	PASI-M
		% Moisture	JDL	1	PASI-M
		Modified Sobek 3.2	JH1	1	PASI-MT
		Modified Sobek 3.2	SA1	5	PASI-MT
		Modified Sobek 3.2	JH1	4	PASI-MT
		Modified Sobek 3.2	JH1	1	PASI-MT

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PROJECT NARRATIVE

Project: Black Pine Mine REV
Pace Project No.: 10163635

Method: **EPA 6020**
Description: 6020 MET ICPMS
Client: Montana Dept. of Environmental Quality
Date: October 18, 2011

General Information:
9 samples were analyzed for EPA 6020. All samples were received in acceptable condition with any exceptions noted below.

Hold Time:
The samples were analyzed within the method required hold times with any exceptions noted below.

Sample Preparation:
The samples were prepared in accordance with EPA 3050 with any exceptions noted below.

Initial Calibrations (including MS Tune as applicable):
All criteria were within method requirements with any exceptions noted below.

Continuing Calibration:
All criteria were within method requirements with any exceptions noted below.

Internal Standards:
All internal standards were within QC limits with any exceptions noted below.

Method Blank:
All analytes were below the report limit in the method blank with any exceptions noted below.

QC Batch: MPRP/27162

P8: Analyte was detected in the method blank. All associated samples had concentrations of at least ten times greater than the blank or were below the reporting limit.

- BLANK (Lab ID: 1014828)
  - Lead

Laboratory Control Spike:
All laboratory control spike compounds were within QC limits with any exceptions noted below.

Matrix Spikes:
All percent recoveries and relative percent differences (RPDs) were within acceptance criteria with any exceptions noted below.

QC Batch: MPRP/27162

A matrix spike and matrix spike duplicate (MS/MSD) were performed on the following sample(s): 10163635001,258469017

M6: Matrix spike and Matrix spike duplicate recovery not evaluated against control limits due to sample dilution.

- MS (Lab ID: 1014830)
  - Barium
  - Copper
  - Iron
  - Lead
  - Manganese
  - Zinc
- MS (Lab ID: 1014832)

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PROJECT NARRATIVE

Project: Black Pine Mine REV
Pace Project No.: 10163635

Method: **EPA 6020**
Description: 6020 MET ICPMS
Client: Montana Dept. of Environmental Quality
Date: October 18, 2011

QC Batch: MPRP/27162

A matrix spike and matrix spike duplicate (MS/MSD) were performed on the following sample(s): 10163635001,258469017

M6: Matrix spike and Matrix spike duplicate recovery not evaluated against control limits due to sample dilution.

- Antimony
- Arsenic
- Copper
- Iron
- Manganese
- Zinc

- MSD (Lab ID: 1014831)
  - Barium
  - Copper
  - Iron
  - Lead
  - Manganese
  - Zinc

Duplicate Sample:
All duplicate sample results were within method acceptance criteria with any exceptions noted below.

Additional Comments:

Analyte Comments:

QC Batch: MPRP/27162

P8: Analyte was detected in the method blank. All associated samples had concentrations of at least ten times greater than the blank or were below the reporting limit.

- BLANK (Lab ID: 1014828)
  - Lead

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PROJECT NARRATIVE

Project: Black Pine Mine REV
Pace Project No.: 10163635

Method: **EPA 7471**
Description: 7471 Mercury
Client: Montana Dept. of Environmental Quality
Date: October 18, 2011

General Information:
9 samples were analyzed for EPA 7471. All samples were received in acceptable condition with any exceptions noted below.

Hold Time:
The samples were analyzed within the method required hold times with any exceptions noted below.

Sample Preparation:
The samples were prepared in accordance with EPA 7471 with any exceptions noted below.

Initial Calibrations (including MS Tune as applicable):
All criteria were within method requirements with any exceptions noted below.

Continuing Calibration:
All criteria were within method requirements with any exceptions noted below.

Method Blank:
All analytes were below the report limit in the method blank with any exceptions noted below.

Laboratory Control Spike:
All laboratory control spike compounds were within QC limits with any exceptions noted below.

Matrix Spikes:
All percent recoveries and relative percent differences (RPDs) were within acceptance criteria with any exceptions noted below.

QC Batch: MERP/5648

A matrix spike and matrix spike duplicate (MS/MSD) were performed on the following sample(s): 10163606001,10163635009

M1: Matrix spike recovery exceeded QC limits. Batch accepted based on laboratory control sample (LCS) recovery.

- MS (Lab ID: 1016597)
  - Mercury
- MSD (Lab ID: 1016598)
  - Mercury

M6: Matrix spike and Matrix spike duplicate recovery not evaluated against control limits due to sample dilution.

- MS (Lab ID: 1016599)
  - Mercury

Duplicate Sample:
All duplicate sample results were within method acceptance criteria with any exceptions noted below.

Additional Comments:

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PROJECT NARRATIVE

Project: Black Pine Mine REV
Pace Project No.: 10163635

Method: **Modified Sobek 3.2**
Description: Sobek Acid Base Potential
Client: Montana Dept. of Environmental Quality
Date: October 18, 2011

General Information:
7 samples were analyzed for Modified Sobek 3.2. All samples were received in acceptable condition with any exceptions noted below.

Hold Time:
The samples were analyzed within the method required hold times with any exceptions noted below.

Initial Calibrations (including MS Tune as applicable):
All criteria were within method requirements with any exceptions noted below.

Continuing Calibration:
All criteria were within method requirements with any exceptions noted below.

Internal Standards:
All internal standards were within QC limits with any exceptions noted below.

Surrogates:
All surrogates were within QC limits with any exceptions noted below.

Method Blank:
All analytes were below the report limit in the method blank with any exceptions noted below.

Laboratory Control Spike:
All laboratory control spike compounds were within QC limits with any exceptions noted below.

Matrix Spikes:
All percent recoveries and relative percent differences (RPDs) were within acceptance criteria with any exceptions noted below.

Duplicate Sample:
All duplicate sample results were within method acceptance criteria with any exceptions noted below.

Additional Comments:

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PROJECT NARRATIVE

Project: Black Pine Mine REV
Pace Project No.: 10163635

Method: **Modified Sobek 3.2**
Description: Sobek Extractable Sulfur
Client: Montana Dept. of Environmental Quality
Date: October 18, 2011

General Information:
7 samples were analyzed for Modified Sobek 3.2. All samples were received in acceptable condition with any exceptions noted below.

Hold Time:
The samples were analyzed within the method required hold times with any exceptions noted below.

Initial Calibrations (including MS Tune as applicable):
All criteria were within method requirements with any exceptions noted below.

Continuing Calibration:
All criteria were within method requirements with any exceptions noted below.

Internal Standards:
All internal standards were within QC limits with any exceptions noted below.

Surrogates:
All surrogates were within QC limits with any exceptions noted below.

Method Blank:
All analytes were below the report limit in the method blank with any exceptions noted below.

Laboratory Control Spike:
All laboratory control spike compounds were within QC limits with any exceptions noted below.

Matrix Spikes:
All percent recoveries and relative percent differences (RPDs) were within acceptance criteria with any exceptions noted below.

Duplicate Sample:
All duplicate sample results were within method acceptance criteria with any exceptions noted below.

Additional Comments:

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PROJECT NARRATIVE

Project: Black Pine Mine REV
Pace Project No.: 10163635

Method: **Modified Sobek 3.2**
Description: Sobek Calculations
Client: Montana Dept. of Environmental Quality
Date: October 18, 2011

General Information:
7 samples were analyzed for Modified Sobek 3.2. All samples were received in acceptable condition with any exceptions noted below.

Hold Time:
The samples were analyzed within the method required hold times with any exceptions noted below.

Initial Calibrations (including MS Tune as applicable):
All criteria were within method requirements with any exceptions noted below.

Continuing Calibration:
All criteria were within method requirements with any exceptions noted below.

Internal Standards:
All internal standards were within QC limits with any exceptions noted below.

Surrogates:
All surrogates were within QC limits with any exceptions noted below.

Method Blank:
All analytes were below the report limit in the method blank with any exceptions noted below.

Laboratory Control Spike:
All laboratory control spike compounds were within QC limits with any exceptions noted below.

Matrix Spikes:
All percent recoveries and relative percent differences (RPDs) were within acceptance criteria with any exceptions noted below.

Duplicate Sample:
All duplicate sample results were within method acceptance criteria with any exceptions noted below.

Additional Comments:

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PROJECT NARRATIVE

Project: Black Pine Mine REV
Pace Project No.: 10163635

Method: **Modified Sobek 3.2**
Description: Sobek SMP Buffer pH
Client: Montana Dept. of Environmental Quality
Date: October 18, 2011

General Information:
7 samples were analyzed for Modified Sobek 3.2. All samples were received in acceptable condition with any exceptions noted below.

Hold Time:
The samples were analyzed within the method required hold times with any exceptions noted below.

Initial Calibrations (including MS Tune as applicable):
All criteria were within method requirements with any exceptions noted below.

Continuing Calibration:
All criteria were within method requirements with any exceptions noted below.

Internal Standards:
All internal standards were within QC limits with any exceptions noted below.

Surrogates:
All surrogates were within QC limits with any exceptions noted below.

Method Blank:
All analytes were below the report limit in the method blank with any exceptions noted below.

Laboratory Control Spike:
All laboratory control spike compounds were within QC limits with any exceptions noted below.

Matrix Spikes:
All percent recoveries and relative percent differences (RPDs) were within acceptance criteria with any exceptions noted below.

Duplicate Sample:
All duplicate sample results were within method acceptance criteria with any exceptions noted below.

Additional Comments:

This data package has been reviewed for quality and completeness and is approved for release.

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ANALYTICAL RESULTS

Project: Black Pine Mine REV
Pace Project No.: 10163635

Sample: CMN-SS-15 **Lab ID: 10163635001** Collected: 07/13/11 13:45 Received: 07/14/11 21:00 Matrix: Solid

Results reported on a "dry-weight" basis

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
6020 MET ICPMS	Analytical Method: EPA 6020 Preparation Method: EPA 3050							
Antimony	**6.6**	mg/kg	0.53	20	07/25/11 08:21	07/29/11 01:03	7440-36-0	
Arsenic	**11.5**	mg/kg	0.53	20	07/25/11 08:21	07/29/11 01:03	7440-38-2	
Barium	**63.6**	mg/kg	0.32	20	07/25/11 08:21	07/29/11 01:03	7440-39-3	M6
Cadmium	**0.60**	mg/kg	0.084	20	07/25/11 08:21	07/29/11 01:03	7440-43-9	
Chromium	**3.2**	mg/kg	0.53	20	07/25/11 08:21	07/29/11 01:03	7440-47-3	
Cobalt	**2.5**	mg/kg	0.53	20	07/25/11 08:21	07/29/11 01:03	7440-48-4	
Copper	**88.5**	mg/kg	0.53	20	07/25/11 08:21	07/29/11 01:03	7440-50-8	M6
Iron	**4490**	mg/kg	52.7	20	07/25/11 08:21	07/29/11 01:03	7439-89-6	M6
Lead	**62.1**	mg/kg	0.11	20	07/25/11 08:21	07/29/11 01:03	7439-92-1	M6
Manganese	**226**	mg/kg	0.53	20	07/25/11 08:21	07/29/11 01:03	7439-96-5	M6
Nickel	**2.6**	mg/kg	0.53	20	07/25/11 08:21	07/29/11 01:03	7440-02-0	
Zinc	**55.4**	mg/kg	5.3	20	07/25/11 08:21	07/29/11 01:03	7440-66-6	M6
7471 Mercury	Analytical Method: EPA 7471 Preparation Method: EPA 7471							
Mercury	**0.093**	mg/kg	0.023	1	07/22/11 14:30	07/27/11 14:06	7439-97-6	
Dry Weight	Analytical Method: % Moisture							
Percent Moisture	**21.6**	%	0.10	1		07/21/11 00:00		

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ANALYTICAL RESULTS

Project: Black Pine Mine REV
Pace Project No.: 10163635

Sample: CMN-SS-16 **Lab ID: 10163635002** Collected: 07/13/11 13:55 Received: 07/14/11 21:00 Matrix: Solid

Results reported on a "dry-weight" basis

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
6020 MET ICPMS	Analytical Method: EPA 6020 Preparation Method: EPA 3050							
Antimony	**36.7**	mg/kg	0.51	20	07/25/11 08:21	07/29/11 01:21	7440-36-0	
Arsenic	**31.7**	mg/kg	0.51	20	07/25/11 08:21	07/29/11 01:21	7440-38-2	
Barium	**89.9**	mg/kg	0.31	20	07/25/11 08:21	07/29/11 01:21	7440-39-3	
Cadmium	**2.9**	mg/kg	0.082	20	07/25/11 08:21	07/29/11 01:21	7440-43-9	
Chromium	**5.0**	mg/kg	0.51	20	07/25/11 08:21	07/29/11 01:21	7440-47-3	
Cobalt	**5.4**	mg/kg	0.51	20	07/25/11 08:21	07/29/11 01:21	7440-48-4	
Copper	**295**	mg/kg	0.51	20	07/25/11 08:21	07/29/11 01:21	7440-50-8	
Iron	**7450**	mg/kg	51.0	20	07/25/11 08:21	07/29/11 01:21	7439-89-6	
Lead	**182**	mg/kg	0.10	20	07/25/11 08:21	07/29/11 01:21	7439-92-1	
Manganese	**556**	mg/kg	2.5	100	07/25/11 08:21	07/29/11 01:26	7439-96-5	
Nickel	**4.9**	mg/kg	0.51	20	07/25/11 08:21	07/29/11 01:21	7440-02-0	
Zinc	**148**	mg/kg	5.1	20	07/25/11 08:21	07/29/11 01:21	7440-66-6	
7471 Mercury	Analytical Method: EPA 7471 Preparation Method: EPA 7471							
Mercury	**0.25**	mg/kg	0.024	1	07/22/11 14:30	07/27/11 14:08	7439-97-6	
Dry Weight	Analytical Method: % Moisture							
Percent Moisture	**20.2**	%	0.10	1		07/21/11 00:00		

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ANALYTICAL RESULTS

Project: Black Pine Mine REV
Pace Project No.: 10163635

Sample: HM-SS-10 **Lab ID: 10163635003** Collected: 07/13/11 14:25 Received: 07/14/11 21:00 Matrix: Solid

Results reported on a "dry-weight" basis

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
6020 MET ICPMS	Analytical Method: EPA 6020 Preparation Method: EPA 3050							
Antimony	**5.0**	mg/kg	0.58	20	07/25/11 08:21	07/29/11 01:30	7440-36-0	
Arsenic	**8.6**	mg/kg	0.58	20	07/25/11 08:21	07/29/11 01:30	7440-38-2	
Barium	**241**	mg/kg	0.35	20	07/25/11 08:21	07/29/11 01:30	7440-39-3	
Cadmium	**1.6**	mg/kg	0.093	20	07/25/11 08:21	07/29/11 01:30	7440-43-9	
Chromium	**10.9**	mg/kg	0.58	20	07/25/11 08:21	07/29/11 01:30	7440-47-3	
Cobalt	**10.9**	mg/kg	0.58	20	07/25/11 08:21	07/29/11 01:30	7440-48-4	
Copper	**2080**	mg/kg	2.9	100	07/25/11 08:21	07/29/11 01:35	7440-50-8	
Iron	**13800**	mg/kg	58.4	20	07/25/11 08:21	07/29/11 01:30	7439-89-6	
Lead	**99.6**	mg/kg	0.12	20	07/25/11 08:21	07/29/11 01:30	7439-92-1	
Manganese	**1400**	mg/kg	2.9	100	07/25/11 08:21	07/29/11 01:35	7439-96-5	
Nickel	**10.7**	mg/kg	0.58	20	07/25/11 08:21	07/29/11 01:30	7440-02-0	
Zinc	**122**	mg/kg	5.8	20	07/25/11 08:21	07/29/11 01:30	7440-66-6	
7471 Mercury	Analytical Method: EPA 7471 Preparation Method: EPA 7471							
Mercury	**0.029**	mg/kg	0.019	1	07/22/11 14:30	07/27/11 14:10	7439-97-6	
Dry Weight	Analytical Method: % Moisture							
Percent Moisture	**17.7**	%	0.10	1		07/21/11 00:00		
Sobek Acid Base Potential	Analytical Method: Modified Sobek 3.2							
Neutralization Potential	**<0.5**	tons/1000	0.50	1		08/02/11 00:00		
Sobek Extractable Sulfur	Analytical Method: Modified Sobek 3.2							
Sulfur, HCl Extractable	**<0.050**	% (w/w)	0.050	1		08/01/11 13:19		
Sulfur, HNO3 Extractable	**<0.050**	% (w/w)	0.050	1		08/01/11 13:19		
Sulfur, Hot Water Extractable	**<0.050**	% (w/w)	0.050	1		08/01/11 13:19		
Sulfur, Residual	**<0.050**	% (w/w)	0.050	1		08/01/11 13:19		
Total Sulfur	**<0.050**	% (w/w)	0.050	1		08/01/11 13:19		
Sobek Calculations	Analytical Method: Modified Sobek 3.2							
Acid/Base Potential	**0**	tons/1000		1		08/02/11 00:00		
Acid Potential	**<4.3**	tons/1000	4.3	1		08/02/11 00:00		
Lime Requirement	**<5.4**	tons/1000	5.4	1		08/02/11 00:00		
SMP Lime Requirement	**3.9**	tons/1000	0.0	1		08/02/11 00:00		
Sobek SMP Buffer pH	Analytical Method: Modified Sobek 3.2							
SMP Buffer pH	**6.4**	Std. Units	0.10	1		07/26/11 09:40		

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ANALYTICAL RESULTS

Project: Black Pine Mine REV
Pace Project No.: 10163635

Sample: HM-SS-09 **Lab ID: 10163635004** Collected: 07/13/11 14:40 Received: 07/14/11 21:00 Matrix: Solid

Results reported on a "dry-weight" basis

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
6020 MET ICPMS	Analytical Method: EPA 6020 Preparation Method: EPA 3050							
Antimony	**20.6**	mg/kg	0.43	20	07/25/11 08:21	07/29/11 01:53	7440-36-0	
Arsenic	**33.8**	mg/kg	0.43	20	07/25/11 08:21	07/29/11 01:53	7440-38-2	
Barium	**179**	mg/kg	0.26	20	07/25/11 08:21	07/29/11 01:53	7440-39-3	
Cadmium	**2.2**	mg/kg	0.069	20	07/25/11 08:21	07/29/11 01:53	7440-43-9	
Chromium	**9.5**	mg/kg	0.43	20	07/25/11 08:21	07/29/11 01:53	7440-47-3	
Cobalt	**7.2**	mg/kg	0.43	20	07/25/11 08:21	07/29/11 01:53	7440-48-4	
Copper	**1390**	mg/kg	2.1	100	07/25/11 08:21	07/29/11 01:57	7440-50-8	
Iron	**13000**	mg/kg	42.8	20	07/25/11 08:21	07/29/11 01:53	7439-89-6	
Lead	**375**	mg/kg	0.086	20	07/25/11 08:21	07/29/11 01:53	7439-92-1	
Manganese	**782**	mg/kg	2.1	100	07/25/11 08:21	07/29/11 01:57	7439-96-5	
Nickel	**10.4**	mg/kg	0.43	20	07/25/11 08:21	07/29/11 01:53	7440-02-0	
Zinc	**136**	mg/kg	4.3	20	07/25/11 08:21	07/29/11 01:53	7440-66-6	
7471 Mercury	Analytical Method: EPA 7471 Preparation Method: EPA 7471							
Mercury	**0.57**	mg/kg	0.021	1	07/22/11 14:30	07/27/11 14:12	7439-97-6	
Dry Weight	Analytical Method: % Moisture							
Percent Moisture	**17.2**	%	0.10	1		07/21/11 00:00		
Sobek Acid Base Potential	Analytical Method: Modified Sobek 3.2							
Neutralization Potential	**<0.5**	tons/1000	0.50	1		08/02/11 00:00		
Sobek Extractable Sulfur	Analytical Method: Modified Sobek 3.2							
Sulfur, HCl Extractable	**<0.050**	% (w/w)	0.050	1		08/01/11 13:51		
Sulfur, HNO3 Extractable	**<0.050**	% (w/w)	0.050	1		08/01/11 13:51		
Sulfur, Hot Water Extractable	**<0.050**	% (w/w)	0.050	1		08/01/11 13:51		
Sulfur, Residual	**<0.050**	% (w/w)	0.050	1		08/01/11 13:51		
Total Sulfur	**<0.050**	% (w/w)	0.050	1		08/01/11 13:51		
Sobek Calculations	Analytical Method: Modified Sobek 3.2							
Acid/Base Potential	**0**	tons/1000		1		08/02/11 00:00		
Acid Potential	**<4.3**	tons/1000	4.3	1		08/02/11 00:00		
Lime Requirement	**7.9**	tons/1000	5.4	1		08/02/11 00:00		
SMP Lime Requirement	**6.0**	tons/1000	0.0	1		08/02/11 00:00		
Sobek SMP Buffer pH	Analytical Method: Modified Sobek 3.2							
SMP Buffer pH	**6.0**	Std. Units	0.10	1		07/26/11 09:40		

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ANALYTICAL RESULTS

Project: Black Pine Mine REV
Pace Project No.: 10163635

Sample: HM-SS-12 **Lab ID: 10163635005** Collected: 07/13/11 15:00 Received: 07/14/11 21:00 Matrix: Solid

Results reported on a "dry-weight" basis

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
6020 MET ICPMS	Analytical Method: EPA 6020 Preparation Method: EPA 3050							
Antimony	**8.1**	mg/kg	0.55	20	07/25/11 08:21	07/29/11 02:02	7440-36-0	
Arsenic	**14.9**	mg/kg	0.55	20	07/25/11 08:21	07/29/11 02:02	7440-38-2	
Barium	**178**	mg/kg	0.33	20	07/25/11 08:21	07/29/11 02:02	7440-39-3	
Cadmium	**0.92**	mg/kg	0.088	20	07/25/11 08:21	07/29/11 02:02	7440-43-9	
Chromium	**7.4**	mg/kg	0.55	20	07/25/11 08:21	07/29/11 02:02	7440-47-3	
Cobalt	**4.6**	mg/kg	0.55	20	07/25/11 08:21	07/29/11 02:02	7440-48-4	
Copper	**389**	mg/kg	0.55	20	07/25/11 08:21	07/29/11 02:02	7440-50-8	
Iron	**9390**	mg/kg	55.1	20	07/25/11 08:21	07/29/11 02:02	7439-89-6	
Lead	**62.9**	mg/kg	0.11	20	07/25/11 08:21	07/29/11 02:02	7439-92-1	
Manganese	**463**	mg/kg	0.55	20	07/25/11 08:21	07/29/11 02:02	7439-96-5	
Nickel	**8.8**	mg/kg	0.55	20	07/25/11 08:21	07/29/11 02:02	7440-02-0	
Zinc	**69.3**	mg/kg	5.5	20	07/25/11 08:21	07/29/11 02:02	7440-66-6	
7471 Mercury	Analytical Method: EPA 7471 Preparation Method: EPA 7471							
Mercury	**0.024**	mg/kg	0.023	1	07/22/11 14:30	07/27/11 14:18	7439-97-6	
Dry Weight	Analytical Method: % Moisture							
Percent Moisture	**16.7**	%	0.10	1		07/21/11 00:00		
Sobek Acid Base Potential	Analytical Method: Modified Sobek 3.2							
Neutralization Potential	**<0.5**	tons/1000	0.50	1		08/02/11 00:00		
Sobek Extractable Sulfur	Analytical Method: Modified Sobek 3.2							
Sulfur, HCl Extractable	**<0.050**	% (w/w)	0.050	1		08/01/11 14:11		
Sulfur, HNO3 Extractable	**<0.050**	% (w/w)	0.050	1		08/01/11 14:11		
Sulfur, Hot Water Extractable	**<0.050**	% (w/w)	0.050	1		08/01/11 14:11		
Sulfur, Residual	**<0.050**	% (w/w)	0.050	1		08/01/11 14:11		
Total Sulfur	**<0.050**	% (w/w)	0.050	1		08/01/11 14:11		
Sobek Calculations	Analytical Method: Modified Sobek 3.2							
Acid/Base Potential	**0**	tons/1000		1		08/02/11 00:00		
Acid Potential	**<4.3**	tons/1000	4.3	1		08/02/11 00:00		
Lime Requirement	**<5.4**	tons/1000	5.4	1		08/02/11 00:00		
SMP Lime Requirement	**3.1**	tons/1000	0.0	1		08/02/11 00:00		
Sobek SMP Buffer pH	Analytical Method: Modified Sobek 3.2							
SMP Buffer pH	**6.5**	Std. Units	0.10	1		07/26/11 09:40		

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ANALYTICAL RESULTS

Project: Black Pine Mine REV
Pace Project No.: 10163635

Sample: HM-SS-11 **Lab ID: 10163635006** Collected: 07/13/11 15:10 Received: 07/14/11 21:00 Matrix: Solid

Results reported on a "dry-weight" basis

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
6020 MET ICPMS	Analytical Method: EPA 6020 Preparation Method: EPA 3050							
Antimony	**31.4**	mg/kg	0.55	20	07/25/11 08:21	07/29/11 02:11	7440-36-0	
Arsenic	**57.8**	mg/kg	0.55	20	07/25/11 08:21	07/29/11 02:11	7440-38-2	
Barium	**93.9**	mg/kg	0.33	20	07/25/11 08:21	07/29/11 02:11	7440-39-3	
Cadmium	**0.70**	mg/kg	0.088	20	07/25/11 08:21	07/29/11 02:11	7440-43-9	
Chromium	**4.6**	mg/kg	0.55	20	07/25/11 08:21	07/29/11 02:11	7440-47-3	
Cobalt	**2.0**	mg/kg	0.55	20	07/25/11 08:21	07/29/11 02:11	7440-48-4	
Copper	**283**	mg/kg	0.55	20	07/25/11 08:21	07/29/11 02:11	7440-50-8	
Iron	**6140**	mg/kg	54.9	20	07/25/11 08:21	07/29/11 02:11	7439-89-6	
Lead	**267**	mg/kg	0.11	20	07/25/11 08:21	07/29/11 02:11	7439-92-1	
Manganese	**254**	mg/kg	0.55	20	07/25/11 08:21	07/29/11 02:11	7439-96-5	
Nickel	**3.9**	mg/kg	0.55	20	07/25/11 08:21	07/29/11 02:11	7440-02-0	
Zinc	**32.0**	mg/kg	5.5	20	07/25/11 08:21	07/29/11 02:11	7440-66-6	
7471 Mercury	Analytical Method: EPA 7471 Preparation Method: EPA 7471							
Mercury	**0.89**	mg/kg	0.022	1	07/22/11 14:30	07/27/11 14:20	7439-97-6	
Dry Weight	Analytical Method: % Moisture							
Percent Moisture	**13.3**	%	0.10	1		07/21/11 00:00		
Sobek Acid Base Potential	Analytical Method: Modified Sobek 3.2							
Neutralization Potential	**<0.5**	tons/1000	0.50	1		08/02/11 00:00		
Sobek Extractable Sulfur	Analytical Method: Modified Sobek 3.2							
Sulfur, HCl Extractable	**<0.050**	% (w/w)	0.050	1		08/01/11 14:22		
Sulfur, HNO3 Extractable	**<0.050**	% (w/w)	0.050	1		08/01/11 14:22		
Sulfur, Hot Water Extractable	**<0.050**	% (w/w)	0.050	1		08/01/11 14:22		
Sulfur, Residual	**<0.050**	% (w/w)	0.050	1		08/01/11 14:22		
Total Sulfur	**<0.050**	% (w/w)	0.050	1		08/01/11 14:22		
Sobek Calculations	Analytical Method: Modified Sobek 3.2							
Acid/Base Potential	**0**	tons/1000		1		08/02/11 00:00		
Acid Potential	**<4.3**	tons/1000	4.3	1		08/02/11 00:00		
Lime Requirement	**7.7**	tons/1000	5.4	1		08/02/11 00:00		
SMP Lime Requirement	**5.3**	tons/1000	0.0	1		08/02/11 00:00		
Sobek SMP Buffer pH	Analytical Method: Modified Sobek 3.2							
SMP Buffer pH	**6.2**	Std. Units	0.10	1		07/26/11 09:40		

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ANALYTICAL RESULTS

Project: Black Pine Mine REV
Pace Project No.: 10163635

Sample: HM-SS-13 **Lab ID: 10163635007** Collected: 07/14/11 08:45 Received: 07/14/11 21:00 Matrix: Solid

Results reported on a "dry-weight" basis

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
6020 MET ICPMS	Analytical Method: EPA 6020 Preparation Method: EPA 3050							
Antimony	**254**	mg/kg	0.58	20	07/25/11 08:21	07/29/11 02:20	7440-36-0	
Arsenic	**316**	mg/kg	0.58	20	07/25/11 08:21	07/29/11 02:20	7440-38-2	
Barium	**305**	mg/kg	0.35	20	07/25/11 08:21	07/29/11 02:20	7440-39-3	
Cadmium	**6.6**	mg/kg	0.092	20	07/25/11 08:21	07/29/11 02:20	7440-43-9	
Chromium	**7.2**	mg/kg	0.58	20	07/25/11 08:21	07/29/11 02:20	7440-47-3	
Cobalt	**4.3**	mg/kg	0.58	20	07/25/11 08:21	07/29/11 02:20	7440-48-4	
Copper	**1420**	mg/kg	2.9	100	07/25/11 08:21	07/29/11 02:24	7440-50-8	
Iron	**15700**	mg/kg	57.6	20	07/25/11 08:21	07/29/11 02:20	7439-89-6	
Lead	**2210**	mg/kg	0.58	100	07/25/11 08:21	07/29/11 02:24	7439-92-1	
Manganese	**1240**	mg/kg	2.9	100	07/25/11 08:21	07/29/11 02:24	7439-96-5	
Nickel	**9.2**	mg/kg	0.58	20	07/25/11 08:21	07/29/11 02:20	7440-02-0	
Zinc	**181**	mg/kg	5.8	20	07/25/11 08:21	07/29/11 02:20	7440-66-6	
7471 Mercury	Analytical Method: EPA 7471 Preparation Method: EPA 7471							
Mercury	**1.0**	mg/kg	0.023	1	07/22/11 14:30	07/27/11 14:22	7439-97-6	
Dry Weight	Analytical Method: % Moisture							
Percent Moisture	**14.0**	%	0.10	1		07/21/11 00:00		
Sobek Acid Base Potential	Analytical Method: Modified Sobek 3.2							
Neutralization Potential	**2.9**	tons/1000	0.50	1		08/02/11 00:00		
Sobek Extractable Sulfur	Analytical Method: Modified Sobek 3.2							
Sulfur, HCl Extractable	**<0.050**	% (w/w)	0.050	1		08/01/11 14:36		
Sulfur, HNO3 Extractable	**<0.050**	% (w/w)	0.050	1		08/01/11 14:36		
Sulfur, Hot Water Extractable	**<0.050**	% (w/w)	0.050	1		08/01/11 14:36		
Sulfur, Residual	**<0.050**	% (w/w)	0.050	1		08/01/11 14:36		
Total Sulfur	**<0.050**	% (w/w)	0.050	1		08/01/11 14:36		
Sobek Calculations	Analytical Method: Modified Sobek 3.2							
Acid/Base Potential	**2.9**	tons/1000		1		08/02/11 00:00		
Acid Potential	**<4.3**	tons/1000	4.3	1		08/02/11 00:00		
Lime Requirement	**<5.4**	tons/1000	5.4	1		08/02/11 00:00		
SMP Lime Requirement	**2.4**	tons/1000	0.0	1		08/02/11 00:00		
Sobek SMP Buffer pH	Analytical Method: Modified Sobek 3.2							
SMP Buffer pH	**6.6**	Std. Units	0.10	1		07/26/11 09:40		

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ANALYTICAL RESULTS

Project: Black Pine Mine REV
Pace Project No.: 10163635

Sample: HM-SS-14 **Lab ID: 10163635008** Collected: 07/14/11 08:15 Received: 07/14/11 21:00 Matrix: Solid

Results reported on a "dry-weight" basis

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
6020 MET ICPMS	Analytical Method: EPA 6020 Preparation Method: EPA 3050							
Antimony	**149**	mg/kg	0.51	20	07/25/11 08:21	07/29/11 02:29	7440-36-0	
Arsenic	**141**	mg/kg	0.51	20	07/25/11 08:21	07/29/11 02:29	7440-38-2	
Barium	**254**	mg/kg	0.31	20	07/25/11 08:21	07/29/11 02:29	7440-39-3	
Cadmium	**2.3**	mg/kg	0.082	20	07/25/11 08:21	07/29/11 02:29	7440-43-9	
Chromium	**6.5**	mg/kg	0.51	20	07/25/11 08:21	07/29/11 02:29	7440-47-3	
Cobalt	**2.8**	mg/kg	0.51	20	07/25/11 08:21	07/29/11 02:29	7440-48-4	
Copper	**662**	mg/kg	2.6	100	07/25/11 08:21	07/29/11 02:33	7440-50-8	
Iron	**12800**	mg/kg	51.4	20	07/25/11 08:21	07/29/11 02:29	7439-89-6	
Lead	**857**	mg/kg	0.51	100	07/25/11 08:21	07/29/11 02:33	7439-92-1	
Manganese	**461**	mg/kg	0.51	20	07/25/11 08:21	07/29/11 02:29	7439-96-5	
Nickel	**10.4**	mg/kg	0.51	20	07/25/11 08:21	07/29/11 02:29	7440-02-0	
Zinc	**135**	mg/kg	5.1	20	07/25/11 08:21	07/29/11 02:29	7440-66-6	
7471 Mercury	Analytical Method: EPA 7471 Preparation Method: EPA 7471							
Mercury	**0.26**	mg/kg	0.021	1	07/22/11 14:30	07/27/11 14:24	7439-97-6	
Dry Weight	Analytical Method: % Moisture							
Percent Moisture	**14.7**	%	0.10	1		07/21/11 00:00		
Sobek Acid Base Potential	Analytical Method: Modified Sobek 3.2							
Neutralization Potential	**<0.5**	tons/1000	0.50	1		08/02/11 00:00		
Sobek Extractable Sulfur	Analytical Method: Modified Sobek 3.2							
Sulfur, HCl Extractable	**<0.050**	% (w/w)	0.050	1		08/01/11 14:57		
Sulfur, HNO3 Extractable	**<0.050**	% (w/w)	0.050	1		08/01/11 14:57		
Sulfur, Hot Water Extractable	**<0.050**	% (w/w)	0.050	1		08/01/11 14:57		
Sulfur, Residual	**<0.050**	% (w/w)	0.050	1		08/01/11 14:57		
Total Sulfur	**<0.050**	% (w/w)	0.050	1		08/01/11 14:57		
Sobek Calculations	Analytical Method: Modified Sobek 3.2							
Acid/Base Potential	**0**	tons/1000		1		08/02/11 00:00		
Acid Potential	**<4.3**	tons/1000	4.3	1		08/02/11 00:00		
Lime Requirement	**<5.4**	tons/1000	5.4	1		08/02/11 00:00		
SMP Lime Requirement	**3.1**	tons/1000	0.0	1		08/02/11 00:00		
Sobek SMP Buffer pH	Analytical Method: Modified Sobek 3.2							
SMP Buffer pH	**6.5**	Std. Units	0.10	1		07/26/11 09:40		

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ANALYTICAL RESULTS

Project: Black Pine Mine REV
Pace Project No.: 10163635

Sample: HM-SS-16 **Lab ID: 10163635009** Collected: 07/14/11 10:35 Received: 07/14/11 21:00 Matrix: Solid

Results reported on a "dry-weight" basis

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
6020 MET ICPMS	Analytical Method: EPA 6020 Preparation Method: EPA 3050							
Antimony	**1160**	mg/kg	1.9	100	07/25/11 08:21	07/29/11 02:55	7440-36-0	
Arsenic	**1140**	mg/kg	1.9	100	07/25/11 08:21	07/29/11 02:55	7440-38-2	
Barium	**228**	mg/kg	0.22	20	07/25/11 08:21	07/29/11 02:51	7440-39-3	
Cadmium	**11.4**	mg/kg	0.060	20	07/25/11 08:21	07/29/11 02:51	7440-43-9	
Chromium	**2.3**	mg/kg	0.37	20	07/25/11 08:21	07/29/11 02:51	7440-47-3	
Cobalt	**0.43**	mg/kg	0.37	20	07/25/11 08:21	07/29/11 02:51	7440-48-4	
Copper	**1530**	mg/kg	1.9	100	07/25/11 08:21	07/29/11 02:55	7440-50-8	
Iron	**53600**	mg/kg	187	100	07/25/11 08:21	07/29/11 02:55	7439-89-6	
Lead	**4900**	mg/kg	1.9	500	07/25/11 08:21	07/29/11 12:43	7439-92-1	
Manganese	**64.8**	mg/kg	0.37	20	07/25/11 08:21	07/29/11 02:51	7439-96-5	
Nickel	**1.1**	mg/kg	0.37	20	07/25/11 08:21	07/29/11 02:51	7440-02-0	
Zinc	**297**	mg/kg	3.7	20	07/25/11 08:21	07/29/11 02:51	7440-66-6	
7471 Mercury	Analytical Method: EPA 7471 Preparation Method: EPA 7471							
Mercury	**13.0**	mg/kg	0.46	25	07/22/11 14:30	07/27/11 14:53	7439-97-6	M6
Dry Weight	Analytical Method: % Moisture							
Percent Moisture	**6.9**	%	0.10	1		07/21/11 00:00		
Sobek Acid Base Potential	Analytical Method: Modified Sobek 3.2							
Neutralization Potential	**<0.5**	tons/1000	0.50	1		08/02/11 00:00		
Sobek Extractable Sulfur	Analytical Method: Modified Sobek 3.2							
Sulfur, HCl Extractable	**<0.050**	% (w/w)	0.050	1		08/01/11 15:27		
Sulfur, HNO3 Extractable	**0.255**	% (w/w)	0.050	1		08/01/11 15:27		
Sulfur, Hot Water Extractable	**0.312**	% (w/w)	0.050	1		08/01/11 15:27		
Sulfur, Residual	**<0.050**	% (w/w)	0.050	1		08/01/11 15:27		
Total Sulfur	**0.452**	% (w/w)	0.050	1		08/01/11 15:27		
Sobek Calculations	Analytical Method: Modified Sobek 3.2							
Acid/Base Potential	**-8.2**	tons/1000		1		08/02/11 00:00		
Acid Potential	**8.2**	tons/1000	4.3	1		08/02/11 00:00		
Lime Requirement	**16.9**	tons/1000	5.4	1		08/02/11 00:00		
SMP Lime Requirement	**5.3**	tons/1000	0.0	1		08/02/11 00:00		
Sobek SMP Buffer pH	Analytical Method: Modified Sobek 3.2							
SMP Buffer pH	**6.2**	Std. Units	0.10	1		07/26/11 09:40		

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QUALITY CONTROL DATA

Project: Black Pine Mine REV
Pace Project No.: 10163635

QC Batch: MPRP/27162 Analysis Method: EPA 6020
QC Batch Method: EPA 3050 Analysis Description: 6020 MET
Associated Lab Samples: 10163635001, 10163635002, 10163635003, 10163635004, 10163635005, 10163635006, 10163635007, 10163635008, 10163635009

METHOD BLANK: 1014828 Matrix: Solid
Associated Lab Samples: 10163635001, 10163635002, 10163635003, 10163635004, 10163635005, 10163635006, 10163635007, 10163635008, 10163635009

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Antimony	mg/kg	<0.50	0.50	07/29/11 00:55	
Arsenic	mg/kg	<0.50	0.50	07/29/11 00:55	
Barium	mg/kg	<0.30	0.30	07/29/11 00:55	
Cadmium	mg/kg	<0.079	0.079	07/29/11 00:55	
Chromium	mg/kg	<0.50	0.50	07/29/11 00:55	
Cobalt	mg/kg	<0.50	0.50	07/29/11 00:55	
Copper	mg/kg	<0.50	0.50	07/29/11 00:55	
Iron	mg/kg	<49.5	49.5	07/29/11 00:55	
Lead	mg/kg	0.17	0.099	07/29/11 00:55	P8
Manganese	mg/kg	<0.50	0.50	07/29/11 00:55	
Nickel	mg/kg	<0.50	0.50	07/29/11 00:55	
Zinc	mg/kg	<5.0	5.0	07/29/11 00:55	

LABORATORY CONTROL SAMPLE: 1014829

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Antimony	mg/kg	14.2	15.2	107	75-125	
Arsenic	mg/kg	14.2	15.1	106	75-125	
Barium	mg/kg	14.2	15.1	106	75-125	
Cadmium	mg/kg	14.2	15.2	108	75-125	
Chromium	mg/kg	14.2	15.7	110	75-125	
Cobalt	mg/kg	14.2	15.9	112	75-125	
Copper	mg/kg	14.2	16.6	117	75-125	
Iron	mg/kg	177	197	111	75-125	
Lead	mg/kg	14.2	15.6	110	75-125	
Manganese	mg/kg	14.2	15.5	110	75-125	
Nickel	mg/kg	14.2	16.1	114	75-125	
Zinc	mg/kg	14.2	16.4	116	75-125	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 1014830 1014831

Parameter	Units	10163635001 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Antimony	mg/kg	6.6	21.3	22.2	25.5	28.1	89	97	75-125	10	20	
Arsenic	mg/kg	11.5	21.3	22.2	34.9	36.6	110	113	75-125	5	20	
Barium	mg/kg	63.6	21.3	22.2	105	111	195	213	75-125	5	20	M6
Cadmium	mg/kg	0.60	21.3	22.2	22.8	24.5	105	108	75-125	7	20	
Chromium	mg/kg	3.2	21.3	22.2	27.3	29.2	113	117	75-125	7	20	

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QUALITY CONTROL DATA

Project: Black Pine Mine REV
Pace Project No.: 10163635

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 1014830 1014831

Parameter	Units	10163635001 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Cobalt	mg/kg	2.5	21.3	22.2	25.4	26.9	108	110	75-125	6	20	
Copper	mg/kg	88.5	21.3	22.2	95.8	90.7	34	10	75-125	5	20	M6
Iron	mg/kg	4490	265	277	5620	5330	422	302	75-125	5	20	M6
Lead	mg/kg	62.1	21.3	22.2	89.9	106	131	198	75-125	17	20	M6
Manganese	mg/kg	226	21.3	22.2	385	284	748	264	75-125	30	20	D6,M6
Nickel	mg/kg	2.6	21.3	22.2	26.9	28.5	114	117	75-125	6	20	
Zinc	mg/kg	55.4	21.3	22.2	90.6	88.4	165	148	75-125	3	20	M6

MATRIX SPIKE SAMPLE: 1014832

Parameter	Units	258469017 Result	Spike Conc.	MS Result	MS % Rec	% Rec Limits	Qualifiers
Antimony	mg/kg		23.9	16.3	64	75-125	M6
Arsenic	mg/kg		23.9	60.4	38	75-125	M6
Barium	mg/kg		23.9	83.7	104	75-125	
Cadmium	mg/kg		23.9	25.1	104	75-125	
Chromium	mg/kg		23.9	77.3	81	75-125	
Cobalt	mg/kg		23.9	39.0	94	75-125	
Copper	mg/kg		23.9	118	-.4	75-125	M6
Iron	mg/kg		299	45400	-2770	75-125	M6
Lead	mg/kg	6530 ug/kg	23.9	30.3	100	75-125	
Manganese	mg/kg		23.9	1040	-232	75-125	M6
Nickel	mg/kg		23.9	61.1	83	75-125	
Zinc	mg/kg	88700 ug/kg	23.9	105	68	75-125	M6

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QUALITY CONTROL DATA

Project: Black Pine Mine REV
Pace Project No.: 10163635

QC Batch: MERP/5648 Analysis Method: EPA 7471
QC Batch Method: EPA 7471 Analysis Description: 7471 Mercury
Associated Lab Samples: 10163635001, 10163635002, 10163635003, 10163635004, 10163635005, 10163635006, 10163635007, 10163635008, 10163635009

METHOD BLANK: 1016595 Matrix: Solid
Associated Lab Samples: 10163635001, 10163635002, 10163635003, 10163635004, 10163635005, 10163635006, 10163635007, 10163635008, 10163635009

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Mercury	mg/kg	<0.019	0.019	07/27/11 13:13	

LABORATORY CONTROL SAMPLE: 1016596

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Mercury	mg/kg	.47	0.51	108	80-120	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 1016597 1016598

Parameter	Units	10163606001 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Mercury	mg/kg	0.86	.54	.57	0.77	1.3	-16	75	80-120	50	20	D6,M1

MATRIX SPIKE SAMPLE: 1016599

Parameter	Units	10163635009 Result	Spike Conc.	MS Result	MS % Rec	% Rec Limits	Qualifiers
Mercury	mg/kg	13.0	.52	13.3	53	80-120	M6

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QUALITY CONTROL DATA

Project: Black Pine Mine REV
Pace Project No.: 10163635

QC Batch: MPRP/27258 Analysis Method: % Moisture
QC Batch Method: % Moisture Analysis Description: Dry Weight/Percent Moisture
Associated Lab Samples: 10163635001, 10163635002, 10163635003, 10163635004, 10163635005, 10163635006, 10163635007, 10163635008, 10163635009

SAMPLE DUPLICATE: 1017623

Parameter	Units	10163606004 Result	Dup Result	RPD	Max RPD	Qualifiers
Percent Moisture	%	15.0	14.2	5	30	

SAMPLE DUPLICATE: 1017624

Parameter	Units	10163635009 Result	Dup Result	RPD	Max RPD	Qualifiers
Percent Moisture	%	6.9	7.6	9	30	

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QUALITY CONTROL DATA

Project: Black Pine Mine REV
Pace Project No.: 10163635

QC Batch: MT/6496 Analysis Method: Modified Sobek 3.2
QC Batch Method: Modified Sobek 3.2 Analysis Description: Sobek Acid Base Potential
Associated Lab Samples: 10163635003, 10163635004, 10163635005, 10163635006, 10163635007, 10163635008, 10163635009

METHOD BLANK: 1020547 Matrix: Solid
Associated Lab Samples: 10163635003, 10163635004, 10163635005, 10163635006, 10163635007, 10163635008, 10163635009

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Neutralization Potential	tons/1000	<0.5	0.50	08/02/11 00:00	

SAMPLE DUPLICATE: 1020546

Parameter	Units	10163635003 Result	Dup Result	RPD	Max RPD	Qualifiers
Neutralization Potential	tons/1000	<0.5	0.97			

SAMPLE DUPLICATE: 1020548

Parameter	Units	10163633009 Result	Dup Result	RPD	Max RPD	Qualifiers
Neutralization Potential	tons/1000	<0.5	6.5			

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QUALITY CONTROL DATA

Project: Black Pine Mine REV
Pace Project No.: 10163635

QC Batch: MT/6487 Analysis Method: Modified Sobek 3.2
QC Batch Method: Modified Sobek 3.2 Analysis Description: Sobek Extractable Sulfur
Associated Lab Samples: 10163635003, 10163635004, 10163635005, 10163635006, 10163635007, 10163635008, 10163635009

METHOD BLANK: 1019970 Matrix: Solid
Associated Lab Samples: 10163635003, 10163635004, 10163635005, 10163635006, 10163635007, 10163635008, 10163635009

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Total Sulfur	% (w/w)	<0.050	0.050	08/01/11 13:07	

SAMPLE DUPLICATE: 1019972

Parameter	Units	10163635003 Result	Dup Result	RPD	Max RPD	Qualifiers
Total Sulfur	% (w/w)	<0.050	<0.050			

SAMPLE DUPLICATE: 1019973

Parameter	Units	10163633008 Result	Dup Result	RPD	Max RPD	Qualifiers
Total Sulfur	% (w/w)	0.369	0.428	15		

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QUALITY CONTROL DATA

Project: Black Pine Mine REV
Pace Project No.: 10163635

QC Batch: MT/6542 Analysis Method: Modified Sobek 3.2
QC Batch Method: Modified Sobek 3.2 Analysis Description: Sobek SMP Buffer pH
Associated Lab Samples: 10163635003, 10163635004, 10163635005, 10163635006, 10163635007, 10163635008, 10163635009

SAMPLE DUPLICATE: 1022810

Parameter	Units	10163635003 Result	Dup Result	RPD	Max RPD	Qualifiers
SMP Buffer pH	Std. Units	6.4	6.4	.3	20	

SAMPLE DUPLICATE: 1026467

Parameter	Units	10163633008 Result	Dup Result	RPD	Max RPD	Qualifiers
SMP Buffer pH	Std. Units	7.4	7.4	.1	20	

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QUALIFIERS

Project: Black Pine Mine REV
Pace Project No.: 10163635

DEFINITIONS

DF - Dilution Factor, if reported, represents the factor applied to the reported data due to changes in sample preparation, dilution of the sample aliquot, or moisture content.

ND - Not Detected at or above adjusted reporting limit.

J - Estimated concentration above the adjusted method detection limit and below the adjusted reporting limit.

MDL - Adjusted Method Detection Limit.

S - Surrogate

1,2-Diphenylhydrazine (8270 listed analyte) decomposes to Azobenzene.

Consistent with EPA guidelines, unrounded data are displayed and have been used to calculate % recovery and RPD values.

LCS(D) - Laboratory Control Sample (Duplicate)

MS(D) - Matrix Spike (Duplicate)

DUP - Sample Duplicate

RPD - Relative Percent Difference

NC - Not Calculable.

SG - Silica Gel - Clean-Up

U - Indicates the compound was analyzed for, but not detected.

N-Nitrosodiphenylamine decomposes and cannot be separated from Diphenylamine using Method 8270. The result reported for each analyte is a combined concentration.

LABORATORIES

PASI-M	Pace Analytical Services - Minneapolis
PASI-MT	Pace Analytical Services - Montana

ANALYTE QUALIFIERS

D6	The relative percent difference (RPD) between the sample and sample duplicate exceeded laboratory control limits.
M1	Matrix spike recovery exceeded QC limits. Batch accepted based on laboratory control sample (LCS) recovery.
M6	Matrix spike and Matrix spike duplicate recovery not evaluated against control limits due to sample dilution.
P8	Analyte was detected in the method blank. All associated samples had concentrations of at least ten times greater than the blank or were below the reporting limit.

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QUALITY CONTROL DATA CROSS REFERENCE TABLE

Project: Black Pine Mine REV
Pace Project No.: 10163635

Lab ID	Sample ID	QC Batch Method	QC Batch	Analytical Method	Analytical Batch
10163635001	**CMN-SS-15**	EPA 3050	MPRP/27162	EPA 6020	ICPM/11086
10163635002	**CMN-SS-16**	EPA 3050	MPRP/27162	EPA 6020	ICPM/11086
10163635003	**HM-SS-10**	EPA 3050	MPRP/27162	EPA 6020	ICPM/11086
10163635004	**HM-SS-09**	EPA 3050	MPRP/27162	EPA 6020	ICPM/11086
10163635005	**HM-SS-12**	EPA 3050	MPRP/27162	EPA 6020	ICPM/11086
10163635006	**HM-SS-11**	EPA 3050	MPRP/27162	EPA 6020	ICPM/11086
10163635007	**HM-SS-13**	EPA 3050	MPRP/27162	EPA 6020	ICPM/11086
10163635008	**HM-SS-14**	EPA 3050	MPRP/27162	EPA 6020	ICPM/11086
10163635009	**HM-SS-16**	EPA 3050	MPRP/27162	EPA 6020	ICPM/11086
10163635001	**CMN-SS-15**	EPA 7471	MERP/5648	EPA 7471	MERC/6470
10163635002	**CMN-SS-16**	EPA 7471	MERP/5648	EPA 7471	MERC/6470
10163635003	**HM-SS-10**	EPA 7471	MERP/5648	EPA 7471	MERC/6470
10163635004	**HM-SS-09**	EPA 7471	MERP/5648	EPA 7471	MERC/6470
10163635005	**HM-SS-12**	EPA 7471	MERP/5648	EPA 7471	MERC/6470
10163635006	**HM-SS-11**	EPA 7471	MERP/5648	EPA 7471	MERC/6470
10163635007	**HM-SS-13**	EPA 7471	MERP/5648	EPA 7471	MERC/6470
10163635008	**HM-SS-14**	EPA 7471	MERP/5648	EPA 7471	MERC/6470
10163635009	**HM-SS-16**	EPA 7471	MERP/5648	EPA 7471	MERC/6470
10163635001	**CMN-SS-15**	% Moisture	MPRP/27258		
10163635002	**CMN-SS-16**	% Moisture	MPRP/27258		
10163635003	**HM-SS-10**	% Moisture	MPRP/27258		
10163635004	**HM-SS-09**	% Moisture	MPRP/27258		
10163635005	**HM-SS-12**	% Moisture	MPRP/27258		
10163635006	**HM-SS-11**	% Moisture	MPRP/27258		
10163635007	**HM-SS-13**	% Moisture	MPRP/27258		
10163635008	**HM-SS-14**	% Moisture	MPRP/27258		
10163635009	**HM-SS-16**	% Moisture	MPRP/27258		
10163635003	**HM-SS-10**	Modified Sobek 3.2	MT/6496		
10163635004	**HM-SS-09**	Modified Sobek 3.2	MT/6496		
10163635005	**HM-SS-12**	Modified Sobek 3.2	MT/6496		
10163635006	**HM-SS-11**	Modified Sobek 3.2	MT/6496		
10163635007	**HM-SS-13**	Modified Sobek 3.2	MT/6496		
10163635008	**HM-SS-14**	Modified Sobek 3.2	MT/6496		
10163635009	**HM-SS-16**	Modified Sobek 3.2	MT/6496		
10163635003	**HM-SS-10**	Modified Sobek 3.2	MT/6487		
10163635004	**HM-SS-09**	Modified Sobek 3.2	MT/6487		
10163635005	**HM-SS-12**	Modified Sobek 3.2	MT/6487		
10163635006	**HM-SS-11**	Modified Sobek 3.2	MT/6487		
10163635007	**HM-SS-13**	Modified Sobek 3.2	MT/6487		
10163635008	**HM-SS-14**	Modified Sobek 3.2	MT/6487		
10163635009	**HM-SS-16**	Modified Sobek 3.2	MT/6487		
10163635003	**HM-SS-10**	Modified Sobek 3.2	MT/6500		
10163635004	**HM-SS-09**	Modified Sobek 3.2	MT/6500		
10163635005	**HM-SS-12**	Modified Sobek 3.2	MT/6500		
10163635006	**HM-SS-11**	Modified Sobek 3.2	MT/6500		
10163635007	**HM-SS-13**	Modified Sobek 3.2	MT/6500		

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QUALITY CONTROL DATA CROSS REFERENCE TABLE

Project: Black Pine Mine REV
Pace Project No.: 10163635

Lab ID	Sample ID	QC Batch Method	QC Batch	Analytical Method	Analytical Batch
10163635008	**HM-SS-14**	Modified Sobek 3.2	MT/6500		
10163635009	**HM-SS-16**	Modified Sobek 3.2	MT/6500		
10163635003	**HM-SS-10**	Modified Sobek 3.2	MT/6542		
10163635004	**HM-SS-09**	Modified Sobek 3.2	MT/6542		
10163635005	**HM-SS-12**	Modified Sobek 3.2	MT/6542		
10163635006	**HM-SS-11**	Modified Sobek 3.2	MT/6542		
10163635007	**HM-SS-13**	Modified Sobek 3.2	MT/6542		
10163635008	**HM-SS-14**	Modified Sobek 3.2	MT/6542		
10163635009	**HM-SS-16**	Modified Sobek 3.2	MT/6542		

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CHAIN-OF-CUSTODY / Analytical Request Document

The Chain-of-Custody is a LEGAL DOCUMENT. All relevant fields must be completed accurately.

Page: 1 of 1

1429993

Section A Required Client Information:	Section B Required Project Information:	Section C Invoice Information:
Company: Herrera	Report To: Kevin Howe	Attention:
Address:	Copy To: Mark Donner	Company Name: DEQ
		Address:
Email To:	Purchase Order No.:	Pace Quote Reference:
Phone: Fax:	Project Name: Black Pine Mine	Pace Project Manager:
Requested Due Date/TAT:	Project Number:	Pace Profile #:

REGULATORY AGENCY

☐ NPDES ☐ GROUND WATER ☐ DRINKING WATER

☐ UST ☐ RCRA ☐ OTHER

Site Location STATE: ____

Requested Analysis Filtered (Y/N)

Section D Required Client Information

SAMPLE ID
(A-Z, 0-9 / ,-)
Sample IDs MUST BE UNIQUE

Matrix Codes — MATRIX / CODE
Drinking Water DW
Water WT
Waste Water WW
Product P
Soil/Solid SL
Oil OL
Wipe WP
Air AR
Tissue TS
Other OT

ITEM #	SAMPLE ID	MATRIX CODE (see valid codes to left)	SAMPLE TYPE (G=GRAB C=COMP)	COLLECTED COMPOSITE START DATE	COLLECTED COMPOSITE START TIME	COLLECTED COMPOSITE END/GRAB DATE	COLLECTED COMPOSITE END/GRAB TIME	SAMPLE TEMP AT COLLECTION	# OF CONTAINERS	Preservatives: Unpreserved	H_2SO_4	HNO_3	HCl	NaOH	$Na_2S_2O_3$	Methanol	Other	Analysis Test Y/N	Total Metals 1311	Residual Chlorine (Y/N)	Pace Project No./ Lab I.D.
1	CMW-SS-15	SL	G	7/13/11	1345				1	X								X	Y		001
2	CMW-SS-16			7/13/11	1355				1	X								X	Y		002
3	HM-SS-10				1425				2	X								X	Y		003
4	HM-SS-09				1440				2	X								X	Y		004
5	HM-SS-12			↓	1500				2	X								X	Y		005
6	HM-SS-11			7/13/11	1500				2	X								X	Y		006
7	HM-SS-13			7/14/11	0845				2	X								X	Y		007
8	HM-SS-14			7/14/11	0845				2	X								X	Y		008
9	HM-SS-16	↓	↓	7/14/11	1035				2	X								X	Y		009
10																					
11																					
12																					

ADDITIONAL COMMENTS	RELINQUISHED BY / AFFILIATION	DATE	TIME	ACCEPTED BY / AFFILIATION	DATE	TIME	SAMPLE CONDITIONS
	[signature] / Herrera	7/14/11	1540	[signature]	7/14/11	3:43	
	[signature]	7/14/11	9:00	Norma C. Trumble/Pace	7/14/11	2100	
							4.6 / Y / N / Y

Temp in °C | Received on Ice (Y/N) | Custody Sealed Cooler (Y/N) | Samples Intact (Y/N)

ORIGINAL

SAMPLER NAME AND SIGNATURE

PRINT Name of SAMPLER: Luke Dupree II

SIGNATURE of SAMPLER: [signature] DATE Signed (MM/DD/YY): 7/14/11

*Important Note: By signing this form you are accepting Pace's NET 30 day payment terms and agreeing to late charges of 1.5% per month for any invoices not paid within 30 days.

F-ALL-Q-020rev.07, 15-May-2007

Sample Condition Upon Receipt

Pace Analytical

Client Name: Herrera Project # 1683635

Courier: ☐ Fed Ex ☐ UPS ☐ USPS ☐ Client ☐ Commercial ☒ Pace Other _____

Tracking #: Walk in BA face

Custody Seal on Cooler/Box Present: ☐ yes ☒ no Seals intact: ☐ yes ☒ no

Packing Material: ☒ Bubble Wrap ☐ Bubble Bags ☐ None ☐ Other _____ Temp Blank: Yes ∞ No _____

Thermometer Used: 1383045 or 135 Type of Ice: (Wet) Blue None ☒ Samples on ice, cooling process has begun

Cooler Temperature: 4.6° Biological Tissue is Frozen: Yes No

Date and Initials of person examining contents: RW 7/16/11

Temp should be above freezing to 6°C

Comments:

Chain of Custody Present:	☒Yes	☐No	☐N/A
Chain of Custody Filled Out:	☒Yes	☐No	☐N/A
Chain of Custody Relinquished:	☒Yes	☐No	☐N/A
Sampler Name & Signature on COC:	☒Yes	☐No	☐N/A
Samples Arrived within Hold Time:	☒Yes	☐No	☐N/A
Short Hold Time Analysis (<72hr):	☐Yes	☒No	☐N/A
Rush Turn Around Time Requested:	☐Yes	☒No	☐N/A
Sufficient Volume:	☒Yes	☐No	☐N/A
Correct Containers Used:	☒Yes	☐No	☐N/A
-Pace Containers Used:	☒Yes	☐No	☐N/A
Containers Intact:	☒Yes	☐No	☐N/A
Filtered volume received for Dissolved tests	☐Yes	☐No	☒N/A
Sample Labels match COC: RW 7/16/11	☒Yes	☐No	☐N/A
-Includes date/time/ID/Analysis Matrix: WS SL			
All containers needing acid/base preservation have been checked. Noncompliance are noted in 13.	☐Yes	☐No	☒N/A
All containers needing preservation are found to be in compliance with EPA recommendation.	☐Yes	☐No	☒N/A
Exceptions: VOA,Coliform, TOC, Oil and Grease, WI-DRO (water)	☐Yes	☒No	N/A
Samples checked for dechlorination:	☐Yes	☐No	☒N/A
Headspace in VOA Vials (>6mm):	☐Yes	☐No	☒N/A
Trip Blank Present:	☐Yes	☐No	☒N/A
Trip Blank Custody Seals Present	☐Yes	☐No	☒N/A
Pace Trip Blank Lot # (if purchased): N/A			

1. 2. 3. 4. 5. 6. 7. 8.

9. PB

10. 11.

12. Missing ABA bags for samples 001 + 002

13. ☐ HNO3 ☐ H2SO4 ☐ NaOH ☐ HCl

Samp #

Initial when completed	Lot # of added preservative

14. 15. 16.

Client Notification/ Resolution: Field Data Required? Y / N

Person Contacted: Kevin Date/Time: 7/17/11 email

Comments/ Resolution:

Contacted Client about missing sample volume

Project Manager Review: Billy Hoyt **Date:** 7/17/11

Note: Whenever there is a discrepancy affecting North Carolina compliance samples, a copy of this form will be sent to the North Carolina DEHNR Certification Office (i.e out of hold, incorrect preservative, out of temp, incorrect containers)

Pace Analytical Services, Inc.
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(406)254-7226

October 18, 2011

Kevin Houck
Herrera Environmental Consultants
101 East Broadway, Suite 610
Missoula, MT 59802

RE: Project: Black Pine Mine REV
Pace Project No.: 10163640

Dear Kevin Houck:
Enclosed are the analytical results for sample(s) received by the laboratory on July 17, 2011. The results relate only to the samples included in this report.

This report has been revised to add Cobalt and delete Silver.

If you have any questions concerning this report, please feel free to contact me.

Sincerely,

Shawn Davis for
Sally Heinje
sally.heinje@pacelabs.com
Project Manager

Enclosures

cc: Devin Clary, Montana Dept. of Environmental Quality
Mark Donner, Trihydro
Jamie Mongoven, Montana Dept. of Environmental

REPORT OF LABORATORY ANALYSIS

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CERTIFICATIONS

Project: Black Pine Mine REV
Pace Project No.: 10163640

Minnesota Certification IDs

1700 Elm Street SE Suite 200, Minneapolis, MN 55414
A2LA Certification #: 2926.01
Alaska Certification #: UST-078
Alaska Certification #MN00064
Arizona Certification #: AZ-0014
Arkansas Certification #: 88-0680
California Certification #: 01155CA
EPA Region 8 Certification #: Pace
Florida/NELAP Certification #: E87605
Georgia Certification #: 959
Idaho Certification #: MN00064
Illinois Certification #: 200011
Iowa Certification #: 368
Kansas Certification #: E-10167
Louisiana Certification #: 03086
Louisiana Certification #: LA080009
Maine Certification #: 2007029
Maryland Certification #: 322
Michigan DEQ Certification #: 9909
Minnesota Certification #: 027-053-137
Mississippi Certification #: Pace
Montana Certification #: MT CERT0092
Nevada Certification #: MN_00064
Nebraska Certification #: Pace
New Jersey Certification #: MN-002
New Mexico Certification #: Pace
New York Certification #: 11647
North Carolina Certification #: 530
North Dakota Certification #: R-036
North Dakota Certification #: R-036A
Ohio VAP Certification #: CL101
Oklahoma Certification #: D9921
Oklahoma Certification #: 9507
Oregon Certification #: MN200001
Pennsylvania Certification #: 68-00563
Puerto Rico Certification
Tennessee Certification #: 02818
Texas Certification #: T104704192
Washington Certification #: C754
Wisconsin Certification #: 999407970

Montana Certification IDs

602 South 25th Street, Billings, MT 59101
EPA Region 8 Certification #: 8TMS-Q
Idaho Certification #: MT00012
Montana Certification #: MT CERT0040
NVLAP Certification #: 101292-0
Minnesota Dept of Health Certification #: 030-999-442

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SAMPLE SUMMARY

Project: Black Pine Mine REV
Pace Project No.: 10163640

Lab ID	Sample ID	Matrix	Date Collected	Date Received
10163640001	**BP-CML-TS-04-00**	Solid	07/15/11 11:05	07/17/11 19:19
10163640002	**BP-CML-TS-04-02**	Solid	07/15/11 11:07	07/17/11 19:19
10163640003	**BP-CML-SS-04-06**	Solid	07/15/11 11:10	07/17/11 19:19
10163640004	**BP-CML-TS-05-00**	Solid	07/15/11 11:33	07/17/11 19:19
10163640005	**BP-CML-TS-05-02**	Solid	07/15/11 11:35	07/17/11 19:19
10163640006	**BP-CML-SS-05-04**	Solid	07/15/11 11:40	07/17/11 19:19
10163640007	**BP-CML-TS-06-00**	Solid	07/15/11 12:10	07/17/11 19:19
10163640008	**BP-CML-TS-06-02**	Solid	07/15/11 12:13	07/17/11 19:19
10163640009	**BP-CML-SS-06-05**	Solid	07/15/11 12:15	07/17/11 19:19

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SAMPLE ANALYTE COUNT

Project: Black Pine Mine REV
Pace Project No.: 10163640

Lab ID	Sample ID	Method	Analysts	Analytes Reported	Laboratory
10163640001	**BP-CML-TS-04-00**	EPA 6020	RJS	12	PASI-M
		EPA 7471	TEM	1	PASI-M
		% Moisture	AMH	1	PASI-M
10163640002	**BP-CML-TS-04-02**	EPA 6020	RJS	12	PASI-M
		EPA 7471	TEM	1	PASI-M
		% Moisture	AMH	1	PASI-M
		Modified Sobek 3.2	JH1	1	PASI-MT
		Modified Sobek 3.2	JH1	5	PASI-MT
		Modified Sobek 3.2	JH1	4	PASI-MT
		Modified Sobek 3.2	JH1	1	PASI-MT
10163640003	**BP-CML-SS-04-06**	EPA 6020	RJS	12	PASI-M
		EPA 7471	TEM	1	PASI-M
		% Moisture	JDL	1	PASI-M
10163640004	**BP-CML-TS-05-00**	EPA 6020	RJS	12	PASI-M
		EPA 7471	TEM	1	PASI-M
		% Moisture	JDL	1	PASI-M
10163640005	**BP-CML-TS-05-02**	EPA 6020	CJS, TL1	12	PASI-M
		EPA 7471	TEM	1	PASI-M
		% Moisture	JDL	1	PASI-M
		Modified Sobek 3.2	JH1	1	PASI-MT
		Modified Sobek 3.2	JH1	5	PASI-MT
		Modified Sobek 3.2	JH1	4	PASI-MT
		Modified Sobek 3.2	JH1	1	PASI-MT
10163640006	**BP-CML-SS-05-04**	EPA 6020	CJS, TL1	12	PASI-M
		EPA 7471	TEM	1	PASI-M
		% Moisture	JDL	1	PASI-M
10163640007	**BP-CML-TS-06-00**	EPA 6020	CJS, TL1	12	PASI-M
		EPA 7471	TEM	1	PASI-M
		% Moisture	JDL	1	PASI-M
10163640008	**BP-CML-TS-06-02**	EPA 6020	CJS, TL1	12	PASI-M
		EPA 7471	TEM	1	PASI-M
		% Moisture	JDL	1	PASI-M
		Modified Sobek 3.2	JH1	1	PASI-MT
		Modified Sobek 3.2	JH1	5	PASI-MT
		Modified Sobek 3.2	JH1	4	PASI-MT
		Modified Sobek 3.2	JH1	1	PASI-MT
10163640009	**BP-CML-SS-06-05**	EPA 6020	TL1	12	PASI-M

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SAMPLE ANALYTE COUNT

Project: Black Pine Mine REV
Pace Project No.: 10163640

Lab ID	Sample ID	Method	Analysts	Analytes Reported	Laboratory
		EPA 7471	TEM	1	PASI-M
		% Moisture	JDL	1	PASI-M

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PROJECT NARRATIVE

Project: Black Pine Mine REV
Pace Project No.: 10163640

Method: **EPA 6020**
Description: 6020 MET ICPMS
Client: Montana Dept. of Environmental Quality
Date: October 18, 2011

General Information:
9 samples were analyzed for EPA 6020. All samples were received in acceptable condition with any exceptions noted below.

Hold Time:
The samples were analyzed within the method required hold times with any exceptions noted below.

Sample Preparation:
The samples were prepared in accordance with EPA 3050 with any exceptions noted below.

Initial Calibrations (including MS Tune as applicable):
All criteria were within method requirements with any exceptions noted below.

Continuing Calibration:
All criteria were within method requirements with any exceptions noted below.

Internal Standards:
All internal standards were within QC limits with any exceptions noted below.

Method Blank:
All analytes were below the report limit in the method blank with any exceptions noted below.

Laboratory Control Spike:
All laboratory control spike compounds were within QC limits with any exceptions noted below.

Matrix Spikes:
All percent recoveries and relative percent differences (RPDs) were within acceptance criteria with any exceptions noted below.

QC Batch: MPRP/27235

A matrix spike and matrix spike duplicate (MS/MSD) were performed on the following sample(s): 10163982001

M6: Matrix spike and Matrix spike duplicate recovery not evaluated against control limits due to sample dilution.

- MS (Lab ID: 1017007)
  - Copper
  - Iron
  - Lead
  - Manganese
  - Zinc
- MSD (Lab ID: 1017008)
  - Antimony
  - Barium
  - Copper
  - Iron
  - Lead
  - Manganese
  - Zinc

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PROJECT NARRATIVE

Project: Black Pine Mine REV
Pace Project No.: 10163640

Method: **EPA 6020**
Description: 6020 MET ICPMS
Client: Montana Dept. of Environmental Quality
Date: October 18, 2011

QC Batch: MPRP/27167

A matrix spike and matrix spike duplicate (MS/MSD) were performed on the following sample(s): 10163483007,10163634007

M6: Matrix spike and Matrix spike duplicate recovery not evaluated against control limits due to sample dilution.

- MS (Lab ID: 1014855)
  - Antimony
  - Arsenic
  - Barium
  - Cadmium
  - Chromium
  - Copper
  - Iron
  - Lead
  - Manganese
  - Nickel
  - Zinc
- MS (Lab ID: 1014857)
  - Antimony
  - Arsenic
  - Barium
  - Cadmium
  - Chromium
  - Copper
  - Iron
  - Lead
  - Manganese
  - Nickel
  - Zinc
- MSD (Lab ID: 1014856)
  - Antimony
  - Arsenic
  - Barium
  - Cadmium
  - Chromium
  - Copper
  - Iron
  - Lead
  - Manganese
  - Nickel
  - Zinc

Duplicate Sample:
All duplicate sample results were within method acceptance criteria with any exceptions noted below.

Additional Comments:

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PROJECT NARRATIVE

Project: Black Pine Mine REV
Pace Project No.: 10163640

Method: **EPA 7471**
Description: 7471 Mercury
Client: Montana Dept. of Environmental Quality
Date: October 18, 2011

General Information:
9 samples were analyzed for EPA 7471. All samples were received in acceptable condition with any exceptions noted below.

Hold Time:
The samples were analyzed within the method required hold times with any exceptions noted below.

Sample Preparation:
The samples were prepared in accordance with EPA 7471 with any exceptions noted below.

Initial Calibrations (including MS Tune as applicable):
All criteria were within method requirements with any exceptions noted below.

Continuing Calibration:
All criteria were within method requirements with any exceptions noted below.

Method Blank:
All analytes were below the report limit in the method blank with any exceptions noted below.

Laboratory Control Spike:
All laboratory control spike compounds were within QC limits with any exceptions noted below.

Matrix Spikes:
All percent recoveries and relative percent differences (RPDs) were within acceptance criteria with any exceptions noted below.

QC Batch: MERP/5650

A matrix spike and matrix spike duplicate (MS/MSD) were performed on the following sample(s): 10163634009,10163643009

M1: Matrix spike recovery exceeded QC limits. Batch accepted based on laboratory control sample (LCS) recovery.

- MS (Lab ID: 1016609)
  - Mercury
- MSD (Lab ID: 1016610)
  - Mercury

M6: Matrix spike and Matrix spike duplicate recovery not evaluated against control limits due to sample dilution.

- MS (Lab ID: 1016611)
  - Mercury

Duplicate Sample:
All duplicate sample results were within method acceptance criteria with any exceptions noted below.

Additional Comments:

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PROJECT NARRATIVE

Project: Black Pine Mine REV
Pace Project No.: 10163640

Method: **Modified Sobek 3.2**
Description: Sobek Acid Base Potential
Client: Montana Dept. of Environmental Quality
Date: October 18, 2011

General Information:
3 samples were analyzed for Modified Sobek 3.2. All samples were received in acceptable condition with any exceptions noted below.

Hold Time:
The samples were analyzed within the method required hold times with any exceptions noted below.

Initial Calibrations (including MS Tune as applicable):
All criteria were within method requirements with any exceptions noted below.

Continuing Calibration:
All criteria were within method requirements with any exceptions noted below.

Internal Standards:
All internal standards were within QC limits with any exceptions noted below.

Surrogates:
All surrogates were within QC limits with any exceptions noted below.

Method Blank:
All analytes were below the report limit in the method blank with any exceptions noted below.

Laboratory Control Spike:
All laboratory control spike compounds were within QC limits with any exceptions noted below.

Matrix Spikes:
All percent recoveries and relative percent differences (RPDs) were within acceptance criteria with any exceptions noted below.

Duplicate Sample:
All duplicate sample results were within method acceptance criteria with any exceptions noted below.

Additional Comments:

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PROJECT NARRATIVE

Project: Black Pine Mine REV
Pace Project No.: 10163640

Method: **Modified Sobek 3.2**
Description: Sobek Extractable Sulfur
Client: Montana Dept. of Environmental Quality
Date: October 18, 2011

General Information:
3 samples were analyzed for Modified Sobek 3.2. All samples were received in acceptable condition with any exceptions noted below.

Hold Time:
The samples were analyzed within the method required hold times with any exceptions noted below.

Initial Calibrations (including MS Tune as applicable):
All criteria were within method requirements with any exceptions noted below.

Continuing Calibration:
All criteria were within method requirements with any exceptions noted below.

Internal Standards:
All internal standards were within QC limits with any exceptions noted below.

Surrogates:
All surrogates were within QC limits with any exceptions noted below.

Method Blank:
All analytes were below the report limit in the method blank with any exceptions noted below.

Laboratory Control Spike:
All laboratory control spike compounds were within QC limits with any exceptions noted below.

Matrix Spikes:
All percent recoveries and relative percent differences (RPDs) were within acceptance criteria with any exceptions noted below.

Duplicate Sample:
All duplicate sample results were within method acceptance criteria with any exceptions noted below.

Additional Comments:

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PROJECT NARRATIVE

Project: Black Pine Mine REV
Pace Project No.: 10163640

Method: **Modified Sobek 3.2**
Description: Sobek Calculations
Client: Montana Dept. of Environmental Quality
Date: October 18, 2011

General Information:
3 samples were analyzed for Modified Sobek 3.2. All samples were received in acceptable condition with any exceptions noted below.

Hold Time:
The samples were analyzed within the method required hold times with any exceptions noted below.

Initial Calibrations (including MS Tune as applicable):
All criteria were within method requirements with any exceptions noted below.

Continuing Calibration:
All criteria were within method requirements with any exceptions noted below.

Internal Standards:
All internal standards were within QC limits with any exceptions noted below.

Surrogates:
All surrogates were within QC limits with any exceptions noted below.

Method Blank:
All analytes were below the report limit in the method blank with any exceptions noted below.

Laboratory Control Spike:
All laboratory control spike compounds were within QC limits with any exceptions noted below.

Matrix Spikes:
All percent recoveries and relative percent differences (RPDs) were within acceptance criteria with any exceptions noted below.

Duplicate Sample:
All duplicate sample results were within method acceptance criteria with any exceptions noted below.

Additional Comments:

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PROJECT NARRATIVE

Project: Black Pine Mine REV
Pace Project No.: 10163640

Method: **Modified Sobek 3.2**
Description: Sobek SMP Buffer pH
Client: Montana Dept. of Environmental Quality
Date: October 18, 2011

General Information:
3 samples were analyzed for Modified Sobek 3.2. All samples were received in acceptable condition with any exceptions noted below.

Hold Time:
The samples were analyzed within the method required hold times with any exceptions noted below.

Initial Calibrations (including MS Tune as applicable):
All criteria were within method requirements with any exceptions noted below.

Continuing Calibration:
All criteria were within method requirements with any exceptions noted below.

Internal Standards:
All internal standards were within QC limits with any exceptions noted below.

Surrogates:
All surrogates were within QC limits with any exceptions noted below.

Method Blank:
All analytes were below the report limit in the method blank with any exceptions noted below.

Laboratory Control Spike:
All laboratory control spike compounds were within QC limits with any exceptions noted below.

Matrix Spikes:
All percent recoveries and relative percent differences (RPDs) were within acceptance criteria with any exceptions noted below.

Duplicate Sample:
All duplicate sample results were within method acceptance criteria with any exceptions noted below.

Additional Comments:

This data package has been reviewed for quality and completeness and is approved for release.

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ANALYTICAL RESULTS

Project: Black Pine Mine REV
Pace Project No.: 10163640

Sample: BP-CML-TS-04-00 **Lab ID: 10163640001** Collected: 07/15/11 11:05 Received: 07/17/11 19:19 Matrix: Solid

Results reported on a "dry-weight" basis

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
6020 MET ICPMS	Analytical Method: EPA 6020 Preparation Method: EPA 3050							
Antimony	**548**	mg/kg	60.4	2000	08/01/11 15:14	08/04/11 19:02	7440-36-0	
Arsenic	**390**	mg/kg	60.4	2000	08/01/11 15:14	08/04/11 19:02	7440-38-2	
Barium	**434**	mg/kg	0.36	20	08/01/11 15:14	08/04/11 18:58	7440-39-3	
Cadmium	**17.3**	mg/kg	0.097	20	08/01/11 15:14	08/04/11 18:58	7440-43-9	
Chromium	**9.8**	mg/kg	0.60	20	08/01/11 15:14	08/04/11 18:58	7440-47-3	
Cobalt	**2.2**	mg/kg	0.60	20	08/01/11 15:14	08/04/11 18:58	7440-48-4	
Copper	**3240**	mg/kg	60.4	2000	08/01/11 15:14	08/04/11 19:02	7440-50-8	
Iron	**17500**	mg/kg	60.4	20	08/01/11 15:14	08/04/11 18:58	7439-89-6	
Lead	**2460**	mg/kg	12.1	2000	08/01/11 15:14	08/04/11 19:02	7439-92-1	
Manganese	**143**	mg/kg	0.60	20	08/01/11 15:14	08/04/11 18:58	7439-96-5	
Nickel	**6.0**	mg/kg	0.60	20	08/01/11 15:14	08/04/11 18:58	7440-02-0	
Zinc	**278**	mg/kg	6.0	20	08/01/11 15:14	08/04/11 18:58	7440-66-6	
7471 Mercury	Analytical Method: EPA 7471 Preparation Method: EPA 7471							
Mercury	**0.24**	mg/kg	0.025	1	07/28/11 16:35	07/31/11 11:54	7439-97-6	
Dry Weight	Analytical Method: % Moisture							
Percent Moisture	**21.2**	%	0.10	1		07/21/11 16:45		

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ANALYTICAL RESULTS

Project: Black Pine Mine REV
Pace Project No.: 10163640

Sample: BP-CML-TS-04-02 **Lab ID: 10163640002** Collected: 07/15/11 11:07 Received: 07/17/11 19:19 Matrix: Solid

Results reported on a "dry-weight" basis

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
6020 MET ICPMS	Analytical Method: EPA 6020 Preparation Method: EPA 3050							
Antimony	**52.2**	mg/kg	0.61	20	08/01/11 15:14	08/04/11 19:19	7440-36-0	
Arsenic	**50.6**	mg/kg	0.61	20	08/01/11 15:14	08/04/11 19:19	7440-38-2	
Barium	**289**	mg/kg	0.37	20	08/01/11 15:14	08/04/11 19:19	7440-39-3	
Cadmium	**7.1**	mg/kg	0.098	20	08/01/11 15:14	08/04/11 19:19	7440-43-9	
Chromium	**11.8**	mg/kg	0.61	20	08/01/11 15:14	08/04/11 19:19	7440-47-3	
Cobalt	**8.4**	mg/kg	0.61	20	08/01/11 15:14	08/04/11 19:19	7440-48-4	
Copper	**846**	mg/kg	61.3	2000	08/01/11 15:14	08/04/11 19:23	7440-50-8	
Iron	**19000**	mg/kg	61.3	20	08/01/11 15:14	08/04/11 19:19	7439-89-6	
Lead	**181**	mg/kg	0.12	20	08/01/11 15:14	08/04/11 19:19	7439-92-1	
Manganese	**298**	mg/kg	0.61	20	08/01/11 15:14	08/04/11 19:19	7439-96-5	
Nickel	**8.5**	mg/kg	0.61	20	08/01/11 15:14	08/04/11 19:19	7440-02-0	
Zinc	**139**	mg/kg	6.1	20	08/01/11 15:14	08/04/11 19:19	7440-66-6	
7471 Mercury	Analytical Method: EPA 7471 Preparation Method: EPA 7471							
Mercury	**13.1**	mg/kg	0.63	25	07/28/11 16:35	07/31/11 10:01	7439-97-6	
Dry Weight	Analytical Method: % Moisture							
Percent Moisture	**20.8**	%	0.10	1		07/21/11 16:45		
Sobek Acid Base Potential	Analytical Method: Modified Sobek 3.2							
Neutralization Potential	**1.2**	tons/1000	0.50	1		08/01/11 00:00		
Sobek Extractable Sulfur	Analytical Method: Modified Sobek 3.2							
Sulfur, HCl Extractable	**<0.050**	% (w/w)	0.050	1		08/09/11 08:10		
Sulfur, HNO3 Extractable	**<0.050**	% (w/w)	0.050	1		08/09/11 08:10		
Sulfur, Hot Water Extractable	**<0.050**	% (w/w)	0.050	1		08/09/11 08:10		
Sulfur, Residual	**<0.050**	% (w/w)	0.050	1		08/09/11 08:10		
Total Sulfur	**<0.050**	% (w/w)	0.050	1		08/09/11 08:10		
Sobek Calculations	Analytical Method: Modified Sobek 3.2							
Acid/Base Potential	**1.2**	tons/1000		1		08/01/11 00:00		
Acid Potential	**<4.3**	tons/1000	4.3	1		08/01/11 00:00		
Lime Requirement	**11**	tons/1000	5.4	1		08/01/11 00:00		
SMP Lime Requirement	**8.1**	tons/1000	0.0	1		08/01/11 00:00		
Sobek SMP Buffer pH	Analytical Method: Modified Sobek 3.2							
SMP Buffer pH	**5.8**	Std. Units	0.10	1		07/29/11 13:24		

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ANALYTICAL RESULTS

Project: Black Pine Mine REV
Pace Project No.: 10163640

Sample: BP-CML-SS-04-06 **Lab ID: 10163640003** Collected: 07/15/11 11:10 Received: 07/17/11 19:19 Matrix: Solid

Results reported on a "dry-weight" basis

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
6020 MET ICPMS	Analytical Method: EPA 6020 Preparation Method: EPA 3050							
Antimony	**164**	mg/kg	0.63	20	08/01/11 15:14	08/04/11 19:27	7440-36-0	
Arsenic	**121**	mg/kg	0.63	20	08/01/11 15:14	08/04/11 19:27	7440-38-2	
Barium	**286**	mg/kg	0.38	20	08/01/11 15:14	08/04/11 19:27	7440-39-3	
Cadmium	**9.6**	mg/kg	0.10	20	08/01/11 15:14	08/04/11 19:27	7440-43-9	
Chromium	**9.5**	mg/kg	0.63	20	08/01/11 15:14	08/04/11 19:27	7440-47-3	
Cobalt	**11.4**	mg/kg	0.63	20	08/01/11 15:14	08/04/11 19:27	7440-48-4	
Copper	**1230**	mg/kg	62.6	2000	08/01/11 15:14	08/04/11 19:32	7440-50-8	
Iron	**10700**	mg/kg	62.6	20	08/01/11 15:14	08/04/11 19:27	7439-89-6	
Lead	**393**	mg/kg	12.5	2000	08/01/11 15:14	08/04/11 19:32	7439-92-1	
Manganese	**359**	mg/kg	0.63	20	08/01/11 15:14	08/04/11 19:27	7439-96-5	
Nickel	**9.2**	mg/kg	0.63	20	08/01/11 15:14	08/04/11 19:27	7440-02-0	
Zinc	**208**	mg/kg	6.3	20	08/01/11 15:14	08/04/11 19:27	7440-66-6	
7471 Mercury	Analytical Method: EPA 7471 Preparation Method: EPA 7471							
Mercury	**81.1**	mg/kg	6.2	250	07/28/11 16:35	07/31/11 10:09	7439-97-6	
Dry Weight	Analytical Method: % Moisture							
Percent Moisture	**24.6**	%	0.10	1		07/25/11 00:00		

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ANALYTICAL RESULTS

Project: Black Pine Mine REV
Pace Project No.: 10163640

Sample: BP-CML-TS-05-00 **Lab ID: 10163640004** Collected: 07/15/11 11:33 Received: 07/17/11 19:19 Matrix: Solid

Results reported on a "dry-weight" basis

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
6020 MET ICPMS	Analytical Method: EPA 6020 Preparation Method: EPA 3050							
Antimony	**409**	mg/kg	0.62	20	08/01/11 15:14	08/04/11 19:36	7440-36-0	
Arsenic	**353**	mg/kg	0.62	20	08/01/11 15:14	08/04/11 19:36	7440-38-2	
Barium	**421**	mg/kg	0.37	20	08/01/11 15:14	08/04/11 19:36	7440-39-3	
Cadmium	**13.6**	mg/kg	0.099	20	08/01/11 15:14	08/04/11 19:36	7440-43-9	
Chromium	**11.5**	mg/kg	0.62	20	08/01/11 15:14	08/04/11 19:36	7440-47-3	
Cobalt	**7.8**	mg/kg	0.62	20	08/01/11 15:14	08/04/11 19:36	7440-48-4	
Copper	**2020**	mg/kg	62.1	2000	08/01/11 15:14	08/04/11 19:40	7440-50-8	
Iron	**17300**	mg/kg	62.1	20	08/01/11 15:14	08/04/11 19:36	7439-89-6	
Lead	**1840**	mg/kg	12.4	2000	08/01/11 15:14	08/04/11 19:40	7439-92-1	
Manganese	**418**	mg/kg	0.62	20	08/01/11 15:14	08/04/11 19:36	7439-96-5	
Nickel	**8.2**	mg/kg	0.62	20	08/01/11 15:14	08/04/11 19:36	7440-02-0	
Zinc	**311**	mg/kg	6.2	20	08/01/11 15:14	08/04/11 19:36	7440-66-6	
7471 Mercury	Analytical Method: EPA 7471 Preparation Method: EPA 7471							
Mercury	**0.80**	mg/kg	0.65	25	07/28/11 16:35	07/31/11 10:16	7439-97-6	
Dry Weight	Analytical Method: % Moisture							
Percent Moisture	**23.3**	%	0.10	1		07/25/11 00:00		

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ANALYTICAL RESULTS

Project: Black Pine Mine REV
Pace Project No.: 10163640

Sample: BP-CML-TS-05-02 **Lab ID: 10163640005** Collected: 07/15/11 11:35 Received: 07/17/11 19:19 Matrix: Solid

Results reported on a "dry-weight" basis

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
6020 MET ICPMS	Analytical Method: EPA 6020 Preparation Method: EPA 3050							
Antimony	**1190**	mg/kg	24.9	1000	07/22/11 13:36	07/23/11 20:12	7440-36-0	
Arsenic	**1020**	mg/kg	24.9	1000	07/22/11 13:36	07/23/11 20:12	7440-38-2	
Barium	**615**	mg/kg	0.75	50	07/22/11 13:36	07/23/11 19:45	7440-39-3	
Cadmium	**21.0**	mg/kg	0.080	20	07/22/11 13:36	07/23/11 01:28	7440-43-9	
Chromium	**4.9**	mg/kg	0.50	20	07/22/11 13:36	07/23/11 01:28	7440-47-3	
Cobalt	**1.1**	mg/kg	0.50	20	07/22/11 13:36	07/23/11 01:28	7440-48-4	
Copper	**3690**	mg/kg	24.9	1000	07/22/11 13:36	07/23/11 20:12	7440-50-8	
Iron	**20600**	mg/kg	49.8	20	07/22/11 13:36	07/23/11 01:28	7439-89-6	
Lead	**10000**	mg/kg	5.0	1000	07/22/11 13:36	07/26/11 20:59	7439-92-1	
Manganese	**172**	mg/kg	0.50	20	07/22/11 13:36	07/23/11 01:28	7439-96-5	
Nickel	**2.7**	mg/kg	0.50	20	07/22/11 13:36	07/23/11 01:28	7440-02-0	
Zinc	**654**	mg/kg	12.4	50	07/22/11 13:36	07/23/11 19:45	7440-66-6	
7471 Mercury	Analytical Method: EPA 7471 Preparation Method: EPA 7471							
Mercury	**2.5**	mg/kg	0.63	25	07/28/11 16:35	07/31/11 10:18	7439-97-6	
Dry Weight	Analytical Method: % Moisture							
Percent Moisture	**23.3**	%	0.10	1		07/25/11 00:00		
Sobek Acid Base Potential	Analytical Method: Modified Sobek 3.2							
Neutralization Potential	**<0.5**	tons/1000	0.50	1		08/01/11 00:00		
Sobek Extractable Sulfur	Analytical Method: Modified Sobek 3.2							
Sulfur, HCl Extractable	**<0.050**	% (w/w)	0.050	1		08/09/11 08:21		
Sulfur, HNO3 Extractable	**0.0507**	% (w/w)	0.050	1		08/09/11 08:21		
Sulfur, Hot Water Extractable	**0.106**	% (w/w)	0.050	1		08/09/11 08:21		
Sulfur, Residual	**<0.050**	% (w/w)	0.050	1		08/09/11 08:21		
Total Sulfur	**0.155**	% (w/w)	0.050	1		08/09/11 08:21		
Sobek Calculations	Analytical Method: Modified Sobek 3.2							
Acid/Base Potential	**-1.6**	tons/1000		1		08/01/11 00:00		
Acid Potential	**1.6**	tons/1000	4.3	1		08/01/11 00:00		
Lime Requirement	**5.0**	tons/1000	5.4	1		08/01/11 00:00		
SMP Lime Requirement	**2.4**	tons/1000	0.0	1		08/01/11 00:00		
Sobek SMP Buffer pH	Analytical Method: Modified Sobek 3.2							
SMP Buffer pH	**6.6**	Std. Units	0.10	1		07/29/11 13:24		

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ANALYTICAL RESULTS

Project: Black Pine Mine REV
Pace Project No.: 10163640

Sample: BP-CML-SS-05-04 **Lab ID: 10163640006** Collected: 07/15/11 11:40 Received: 07/17/11 19:19 Matrix: Solid

Results reported on a "dry-weight" basis

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
6020 MET ICPMS	Analytical Method: EPA 6020 Preparation Method: EPA 3050							
Antimony	**1260**	mg/kg	1.4	50	07/22/11 13:36	07/23/11 20:09	7440-36-0	
Arsenic	**1030**	mg/kg	1.4	50	07/22/11 13:36	07/23/11 20:09	7440-38-2	
Barium	**495**	mg/kg	0.34	20	07/22/11 13:36	07/23/11 01:31	7440-39-3	
Cadmium	**23.1**	mg/kg	0.092	20	07/22/11 13:36	07/23/11 01:31	7440-43-9	
Chromium	**4.8**	mg/kg	0.57	20	07/22/11 13:36	07/23/11 01:31	7440-47-3	
Cobalt	**1.3**	mg/kg	0.57	20	07/22/11 13:36	07/23/11 01:31	7440-48-4	
Copper	**5600**	mg/kg	28.6	1000	07/22/11 13:36	07/23/11 20:16	7440-50-8	
Iron	**18900**	mg/kg	57.2	20	07/22/11 13:36	07/23/11 01:31	7439-89-6	
Lead	**8010**	mg/kg	5.7	1000	07/22/11 13:36	07/26/11 21:03	7439-92-1	
Manganese	**155**	mg/kg	0.57	20	07/22/11 13:36	07/23/11 01:31	7439-96-5	
Nickel	**3.0**	mg/kg	0.57	20	07/22/11 13:36	07/23/11 01:31	7440-02-0	
Zinc	**371**	mg/kg	5.7	20	07/22/11 13:36	07/23/11 01:31	7440-66-6	
7471 Mercury	Analytical Method: EPA 7471 Preparation Method: EPA 7471							
Mercury	**24.7**	mg/kg	0.66	25	07/28/11 16:35	07/31/11 10:20	7439-97-6	
Dry Weight	Analytical Method: % Moisture							
Percent Moisture	**36.7**	%	0.10	1		07/25/11 00:00		

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ANALYTICAL RESULTS

Project: Black Pine Mine REV
Pace Project No.: 10163640

Sample: BP-CML-TS-06-00 **Lab ID: 10163640007** Collected: 07/15/11 12:10 Received: 07/17/11 19:19 Matrix: Solid

Results reported on a "dry-weight" basis

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
6020 MET ICPMS	Analytical Method: EPA 6020 Preparation Method: EPA 3050							
Antimony	**1040**	mg/kg	20.9	1000	07/22/11 13:36	07/23/11 20:22	7440-36-0	
Arsenic	**830**	mg/kg	1.0	50	07/22/11 13:36	07/23/11 20:19	7440-38-2	
Barium	**463**	mg/kg	0.63	50	07/22/11 13:36	07/23/11 20:19	7440-39-3	
Cadmium	**30.7**	mg/kg	0.067	20	07/22/11 13:36	07/23/11 01:35	7440-43-9	
Chromium	**5.8**	mg/kg	0.42	20	07/22/11 13:36	07/23/11 01:35	7440-47-3	
Cobalt	**2.0**	mg/kg	0.42	20	07/22/11 13:36	07/23/11 01:35	7440-48-4	
Copper	**1740**	mg/kg	20.9	1000	07/22/11 13:36	07/23/11 20:22	7440-50-8	
Iron	**15600**	mg/kg	41.9	20	07/22/11 13:36	07/23/11 01:35	7439-89-6	
Lead	**6790**	mg/kg	4.2	1000	07/22/11 13:36	07/26/11 21:06	7439-92-1	
Manganese	**190**	mg/kg	0.42	20	07/22/11 13:36	07/23/11 01:35	7439-96-5	
Nickel	**4.1**	mg/kg	0.42	20	07/22/11 13:36	07/23/11 01:35	7440-02-0	
Zinc	**220**	mg/kg	4.2	20	07/22/11 13:36	07/23/11 01:35	7440-66-6	
7471 Mercury	Analytical Method: EPA 7471 Preparation Method: EPA 7471							
Mercury	**0.40**	mg/kg	0.025	1	07/28/11 16:35	07/31/11 11:56	7439-97-6	
Dry Weight	Analytical Method: % Moisture							
Percent Moisture	**19.8**	%	0.10	1		07/25/11 00:00		

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ANALYTICAL RESULTS

Project: Black Pine Mine REV
Pace Project No.: 10163640

Sample: BP-CML-TS-06-02 **Lab ID: 10163640008** Collected: 07/15/11 12:13 Received: 07/17/11 19:19 Matrix: Solid

Results reported on a "dry-weight" basis

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
6020 MET ICPMS	Analytical Method: EPA 6020 Preparation Method: EPA 3050							
Antimony	**1410**	mg/kg	26.9	1000	07/22/11 13:36	07/23/11 20:29	7440-36-0	
Arsenic	**1070**	mg/kg	1.3	50	07/22/11 13:36	07/23/11 20:26	7440-38-2	
Barium	**397**	mg/kg	0.32	20	07/22/11 13:36	07/23/11 01:38	7440-39-3	
Cadmium	**22.0**	mg/kg	0.086	20	07/22/11 13:36	07/23/11 01:38	7440-43-9	
Chromium	**4.1**	mg/kg	0.54	20	07/22/11 13:36	07/23/11 01:38	7440-47-3	
Cobalt	**1.3**	mg/kg	0.54	20	07/22/11 13:36	07/23/11 01:38	7440-48-4	
Copper	**4040**	mg/kg	26.9	1000	07/22/11 13:36	07/23/11 20:29	7440-50-8	
Iron	**22600**	mg/kg	53.9	20	07/22/11 13:36	07/23/11 01:38	7439-89-6	
Lead	**6960**	mg/kg	5.4	1000	07/22/11 13:36	07/26/11 21:09	7439-92-1	
Manganese	**246**	mg/kg	0.54	20	07/22/11 13:36	07/23/11 01:38	7439-96-5	
Nickel	**2.4**	mg/kg	0.54	20	07/22/11 13:36	07/23/11 01:38	7440-02-0	
Zinc	**334**	mg/kg	5.4	20	07/22/11 13:36	07/23/11 01:38	7440-66-6	
7471 Mercury	Analytical Method: EPA 7471 Preparation Method: EPA 7471							
Mercury	**46.1**	mg/kg	5.1	250	07/28/11 16:35	07/31/11 10:29	7439-97-6	
Dry Weight	Analytical Method: % Moisture							
Percent Moisture	**16.4**	%	0.10	1		07/25/11 00:00		
Sobek Acid Base Potential	Analytical Method: Modified Sobek 3.2							
Neutralization Potential	**2.4**	tons/1000	0.50	1		08/01/11 00:00		
Sobek Extractable Sulfur	Analytical Method: Modified Sobek 3.2							
Sulfur, HCl Extractable	**<0.050**	% (w/w)	0.050	1		08/09/11 08:40		
Sulfur, HNO3 Extractable	**<0.050**	% (w/w)	0.050	1		08/09/11 08:40		
Sulfur, Hot Water Extractable	**<0.050**	% (w/w)	0.050	1		08/09/11 08:40		
Sulfur, Residual	**<0.050**	% (w/w)	0.050	1		08/09/11 08:40		
Total Sulfur	**0.0970**	% (w/w)	0.050	1		08/09/11 08:40		
Sobek Calculations	Analytical Method: Modified Sobek 3.2							
Acid/Base Potential	**2.4**	tons/1000		1		08/01/11 00:00		
Acid Potential	**<4.3**	tons/1000	4.3	1		08/01/11 00:00		
Lime Requirement	**<5.4**	tons/1000	5.4	1		08/01/11 00:00		
SMP Lime Requirement	**0**	tons/1000	0.0	1		08/01/11 00:00		
Sobek SMP Buffer pH	Analytical Method: Modified Sobek 3.2							
SMP Buffer pH	**7.3**	Std. Units	0.10	1		07/29/11 13:24		

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ANALYTICAL RESULTS

Project: Black Pine Mine REV
Pace Project No.: 10163640

Sample: BP-CML-SS-06-05 **Lab ID: 10163640009** Collected: 07/15/11 12:15 Received: 07/17/11 19:19 Matrix: Solid

Results reported on a "dry-weight" basis

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
6020 MET ICPMS	Analytical Method: EPA 6020 Preparation Method: EPA 3050							
Antimony	**19.2**	mg/kg	0.86	20	07/22/11 13:36	07/23/11 01:41	7440-36-0	
Arsenic	**176**	mg/kg	0.86	20	07/22/11 13:36	07/23/11 01:41	7440-38-2	
Barium	**427**	mg/kg	0.52	20	07/22/11 13:36	07/23/11 01:41	7440-39-3	
Cadmium	**63.1**	mg/kg	0.14	20	07/22/11 13:36	07/23/11 01:41	7440-43-9	
Chromium	**22.6**	mg/kg	0.86	20	07/22/11 13:36	07/23/11 01:41	7440-47-3	
Cobalt	**4.4**	mg/kg	0.86	20	07/22/11 13:36	07/23/11 01:41	7440-48-4	
Copper	**367**	mg/kg	0.86	20	07/22/11 13:36	07/23/11 01:41	7440-50-8	
Iron	**14600**	mg/kg	86.0	20	07/22/11 13:36	07/23/11 01:41	7439-89-6	
Lead	**77.1**	mg/kg	0.17	20	07/22/11 13:36	07/23/11 01:41	7439-92-1	
Manganese	**165**	mg/kg	0.86	20	07/22/11 13:36	07/23/11 01:41	7439-96-5	
Nickel	**19.9**	mg/kg	0.86	20	07/22/11 13:36	07/23/11 01:41	7440-02-0	
Zinc	**576**	mg/kg	8.6	20	07/22/11 13:36	07/23/11 01:41	7440-66-6	
7471 Mercury	Analytical Method: EPA 7471 Preparation Method: EPA 7471							
Mercury	**79.3**	mg/kg	7.9	250	07/28/11 16:35	07/31/11 10:36	7439-97-6	
Dry Weight	Analytical Method: % Moisture							
Percent Moisture	**42.4**	%	0.10	1		07/25/11 00:00		

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QUALITY CONTROL DATA

Project: Black Pine Mine REV
Pace Project No.: 10163640

QC Batch: MPRP/27167 Analysis Method: EPA 6020
QC Batch Method: EPA 3050 Analysis Description: 6020 MET
Associated Lab Samples: 10163640001, 10163640002, 10163640003, 10163640004

METHOD BLANK: 1014853 Matrix: Solid
Associated Lab Samples: 10163640001, 10163640002, 10163640003, 10163640004

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Antimony	mg/kg	<0.49	0.49	08/04/11 03:04	
Arsenic	mg/kg	<0.49	0.49	08/04/11 03:04	
Barium	mg/kg	<0.29	0.29	08/04/11 03:04	
Cadmium	mg/kg	<0.078	0.078	08/04/11 03:04	
Chromium	mg/kg	<0.49	0.49	08/04/11 03:04	
Cobalt	mg/kg	<0.49	0.49	08/04/11 03:04	
Copper	mg/kg	<0.49	0.49	08/04/11 03:04	
Iron	mg/kg	<49.0	49.0	08/04/11 03:04	
Lead	mg/kg	<0.098	0.098	08/04/11 03:04	
Manganese	mg/kg	<0.49	0.49	08/04/11 03:04	
Nickel	mg/kg	<0.49	0.49	08/04/11 03:04	
Zinc	mg/kg	<4.9	4.9	08/04/11 03:04	

LABORATORY CONTROL SAMPLE: 1014854

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Antimony	mg/kg	20	18.2	91	75-125	
Arsenic	mg/kg	20	18.3	92	75-125	
Barium	mg/kg	20	18.1	90	75-125	
Cadmium	mg/kg	20	18.4	92	75-125	
Chromium	mg/kg	20	18.8	94	75-125	
Cobalt	mg/kg	20	18.7	94	75-125	
Copper	mg/kg	20	18.9	94	75-125	
Iron	mg/kg	250	233	93	75-125	
Lead	mg/kg	20	18.8	94	75-125	
Manganese	mg/kg	20	18.4	92	75-125	
Nickel	mg/kg	20	18.8	94	75-125	
Zinc	mg/kg	20	18.8	94	75-125	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 1014855 1014856

Parameter	Units	10163483007 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Antimony	mg/kg	219	21.7	21.7	178	148	-190	-328	75-125	18	20	M6
Arsenic	mg/kg	118	21.7	21.7	202	156	386	173	75-125	26	20	D6,M6
Barium	mg/kg	49.3	21.7	21.7	115	113	302	293	75-125	2	20	M6
Cadmium	mg/kg	0.12	21.7	21.7	54.2	53.7	249	246	75-125	.9	20	M6
Chromium	mg/kg	5.4	21.7	21.7	61.4	62.0	258	260	75-125	1	20	M6
Cobalt	mg/kg	2.5	21.7	21.7	57.8	56.1	254	246	75-125	3	20	
Copper	mg/kg	31.3	21.7	21.7	88.5	89.2	263	266	75-125	.8	20	M6

REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL DATA

Project: Black Pine Mine REV
Pace Project No.: 10163640

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 1014855 1014856

Parameter	Units	10163483007 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Iron	mg/kg	17000	272	272	15300	15900	-622	-408	75-125	4	20	M6
Lead	mg/kg	162	21.7	21.7	230	269	311	490	75-125	16	20	M6
Manganese	mg/kg	67.6	21.7	21.7	169	115	467	220	75-125	38	20	D6,M6
Nickel	mg/kg	4.9	21.7	21.7	57.6	57.7	243	243	75-125	.04	20	M6
Zinc	mg/kg	18.6	21.7	21.7	76.5	80.9	266	287	75-125	6	20	M6

MATRIX SPIKE SAMPLE: 1014857

Parameter	Units	10163634007 Result	Spike Conc.	MS Result	MS % Rec	% Rec Limits	Qualifiers
Antimony	mg/kg	3.3	19.6	41.0	192	75-125	M6
Arsenic	mg/kg	14.4	19.6	69.2	279	75-125	M6
Barium	mg/kg	64.7	19.6	230	841	75-125	M6
Cadmium	mg/kg	1.6	19.6	59.5	295	75-125	M6
Chromium	mg/kg	7.6	19.6	69.5	316	75-125	M6
Cobalt	mg/kg	8.2	19.6	72.2	326	75-125	
Copper	mg/kg	220	19.6	263	220	75-125	M6
Iron	mg/kg	11000	245	13400	1010	75-125	M6
Lead	mg/kg	24.4	19.6	96.1	365	75-125	M6
Manganese	mg/kg	419	19.6	838	2130	75-125	M6
Nickel	mg/kg	4.8	19.6	62.7	295	75-125	M6
Zinc	mg/kg	101	19.6	169	345	75-125	M6

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QUALITY CONTROL DATA

Project: Black Pine Mine REV
Pace Project No.: 10163640

QC Batch: MPRP/27235 Analysis Method: EPA 6020
QC Batch Method: EPA 3050 Analysis Description: 6020 MET
Associated Lab Samples: 10163640005, 10163640006, 10163640007, 10163640008, 10163640009

METHOD BLANK: 1017005 Matrix: Solid
Associated Lab Samples: 10163640005, 10163640006, 10163640007, 10163640008, 10163640009

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Antimony	mg/kg	<0.49	0.49	07/23/11 00:44	
Arsenic	mg/kg	<0.49	0.49	07/23/11 00:44	
Barium	mg/kg	<0.29	0.29	07/23/11 00:44	
Cadmium	mg/kg	<0.078	0.078	07/23/11 00:44	
Chromium	mg/kg	<0.49	0.49	07/23/11 00:44	
Cobalt	mg/kg	<0.49	0.49	07/23/11 00:44	
Copper	mg/kg	<0.49	0.49	07/23/11 00:44	
Iron	mg/kg	<49.0	49.0	07/23/11 00:44	
Lead	mg/kg	<0.098	0.098	07/23/11 00:44	
Manganese	mg/kg	<0.49	0.49	07/23/11 00:44	
Nickel	mg/kg	<0.49	0.49	07/23/11 00:44	
Zinc	mg/kg	<4.9	4.9	07/23/11 00:44	

LABORATORY CONTROL SAMPLE: 1017006

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Antimony	mg/kg	16.7	15.8	95	75-125	
Arsenic	mg/kg	16.7	16.4	98	75-125	
Barium	mg/kg	16.7	17.3	104	75-125	
Cadmium	mg/kg	16.7	17.8	107	75-125	
Chromium	mg/kg	16.7	18.9	113	75-125	
Cobalt	mg/kg	16.7	18.9	113	75-125	
Copper	mg/kg	16.7	18.7	112	75-125	
Iron	mg/kg	208	243	117	75-125	
Lead	mg/kg	16.7	19.6	118	75-125	
Manganese	mg/kg	16.7	17.9	108	75-125	
Nickel	mg/kg	16.7	19.5	117	75-125	
Zinc	mg/kg	16.7	18.8	113	75-125	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 1017007 1017008

Parameter	Units	10163982001 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Antimony	mg/kg	59.0	17.1	20.6	74.1	85.5	88	129	75-125	14	20	M6
Arsenic	mg/kg	35.6	17.1	20.6	49.7	59.7	82	117	75-125	18	20	
Barium	mg/kg	78.6	17.1	20.6	96.1	109	102	148	75-125	13	20	M6
Cadmium	mg/kg	2.7	17.1	20.6	17.3	22.3	85	95	75-125	25	20	D6
Chromium	mg/kg	8.7	17.1	20.6	23.8	30.5	88	106	75-125	25	20	D6
Cobalt	mg/kg		17.1	20.6	17.2	22.9	73	89	75-125	29	20	
Copper	mg/kg	182	17.1	20.6	216	236	197	262	75-125	9	20	M6

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QUALITY CONTROL DATA

Project: Black Pine Mine REV
Pace Project No.: 10163640

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 1017007 1017008

Parameter	Units	10163982001 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Iron	mg/kg	65100	214	257	62600	71100	-1140	2340	75-125	13	20	M6
Lead	mg/kg	13800	17.1	20.6	11600	13200	-13000	-3080	75-125	13	20	M6
Manganese	mg/kg	1750	17.1	20.6	1910	2240	928	2420	75-125	16	20	M6
Nickel	mg/kg	7.4	17.1	20.6	20.4	26.9	76	95	75-125	28	20	D6
Zinc	mg/kg	967	17.1	20.6	936	917	-181	-243	75-125	2	20	M6

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QUALITY CONTROL DATA

Project: Black Pine Mine REV
Pace Project No.: 10163640

QC Batch: MERP/5650 Analysis Method: EPA 7471
QC Batch Method: EPA 7471 Analysis Description: 7471 Mercury
Associated Lab Samples: 10163640001, 10163640002, 10163640003, 10163640004, 10163640005, 10163640006, 10163640007, 10163640008, 10163640009

METHOD BLANK: 1016607 Matrix: Solid
Associated Lab Samples: 10163640001, 10163640002, 10163640003, 10163640004, 10163640005, 10163640006, 10163640007, 10163640008, 10163640009

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Mercury	mg/kg	<0.020	0.020	07/31/11 09:25	

LABORATORY CONTROL SAMPLE: 1016608

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Mercury	mg/kg	.44	0.45	103	80-120	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 1016609 1016610

Parameter	Units	10163634009 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Mercury	mg/kg	0.12	.45	.54	0.23	0.31	25	35	80-120	27	20	D6,M1

MATRIX SPIKE SAMPLE: 1016611

Parameter	Units	10163643009 Result	Spike Conc.	MS Result	MS % Rec	% Rec Limits	Qualifiers
Mercury	mg/kg	137	.6	137	14	80-120	M6

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QUALITY CONTROL DATA

Project: Black Pine Mine REV
Pace Project No.: 10163640

QC Batch: MPRP/27259
QC Batch Method: % Moisture
Analysis Method: % Moisture
Analysis Description: Dry Weight/Percent Moisture
Associated Lab Samples: 10163640001, 10163640002

SAMPLE DUPLICATE: 1017674

Parameter	Units	10164076001 Result	Dup Result	RPD	Max RPD	Qualifiers
Percent Moisture	%	8.0	8.4	5	30	

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QUALITY CONTROL DATA

Project: Black Pine Mine REV
Pace Project No.: 10163640

QC Batch: MPRP/27293 Analysis Method: % Moisture
QC Batch Method: % Moisture Analysis Description: Dry Weight/Percent Moisture
Associated Lab Samples: 10163640003, 10163640004, 10163640005, 10163640006, 10163640007, 10163640008, 10163640009

SAMPLE DUPLICATE: 1019403

Parameter	Units	10163634006 Result	Dup Result	RPD	Max RPD	Qualifiers
Percent Moisture	%	10.3	11.1	7	30	

SAMPLE DUPLICATE: 1019404

Parameter	Units	10163643008 Result	Dup Result	RPD	Max RPD	Qualifiers
Percent Moisture	%	18.6	18.3	2	30	

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QUALITY CONTROL DATA

Project: Black Pine Mine REV
Pace Project No.: 10163640

QC Batch: MT/6497 Analysis Method: Modified Sobek 3.2
QC Batch Method: Modified Sobek 3.2 Analysis Description: Sobek Acid Base Potential
Associated Lab Samples: 10163640002, 10163640005, 10163640008

METHOD BLANK: 1020551 Matrix: Solid
Associated Lab Samples: 10163640002, 10163640005, 10163640008

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Neutralization Potential	tons/1000	<0.5	0.50	08/01/11 00:00	

SAMPLE DUPLICATE: 1020552

Parameter	Units	10163634001 Result	Dup Result	RPD	Max RPD	Qualifiers
Neutralization Potential	tons/1000	0.73	2.2			

SAMPLE DUPLICATE: 1024994

Parameter	Units	10163640008 Result	Dup Result	RPD	Max RPD	Qualifiers
Neutralization Potential	tons/1000	2.4	5.6			

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QUALITY CONTROL DATA

Project: Black Pine Mine REV
Pace Project No.: 10163640

QC Batch: MT/6488 Analysis Method: Modified Sobek 3.2
QC Batch Method: Modified Sobek 3.2 Analysis Description: Sobek Extractable Sulfur
Associated Lab Samples: 10163640002, 10163640005, 10163640008

METHOD BLANK: 1019974 Matrix: Solid
Associated Lab Samples: 10163640002, 10163640005, 10163640008

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Total Sulfur	% (w/w)	<0.050	0.050	08/08/11 14:36	

SAMPLE DUPLICATE: 1019976

Parameter	Units	10163634001 Result	Dup Result	RPD	Max RPD	Qualifiers
Total Sulfur	% (w/w)	<0.050	<0.050			

SAMPLE DUPLICATE: 1019977

Parameter	Units	10163643005 Result	Dup Result	RPD	Max RPD	Qualifiers
Total Sulfur	% (w/w)	0.0605	0.0697	14		

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QUALITY CONTROL DATA

Project: Black Pine Mine REV
Pace Project No.: 10163640

QC Batch: MT/6543 Analysis Method: Modified Sobek 3.2
QC Batch Method: Modified Sobek 3.2 Analysis Description: Sobek SMP Buffer pH
Associated Lab Samples: 10163640002, 10163640005, 10163640008

SAMPLE DUPLICATE: 1022818

Parameter	Units	10163634001 Result	Dup Result	RPD	Max RPD	Qualifiers
SMP Buffer pH	Std. Units	7.3	7.2	.3	20	

SAMPLE DUPLICATE: 1026468

Parameter	Units	10163643005 Result	Dup Result	RPD	Max RPD	Qualifiers
SMP Buffer pH	Std. Units	7.1	7.1	.3	20	

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QUALIFIERS

Project: Black Pine Mine REV
Pace Project No.: 10163640

DEFINITIONS

DF - Dilution Factor, if reported, represents the factor applied to the reported data due to changes in sample preparation, dilution of the sample aliquot, or moisture content.

ND - Not Detected at or above adjusted reporting limit.

J - Estimated concentration above the adjusted method detection limit and below the adjusted reporting limit.

MDL - Adjusted Method Detection Limit.

S - Surrogate

1,2-Diphenylhydrazine (8270 listed analyte) decomposes to Azobenzene.

Consistent with EPA guidelines, unrounded data are displayed and have been used to calculate % recovery and RPD values.

LCS(D) - Laboratory Control Sample (Duplicate)

MS(D) - Matrix Spike (Duplicate)

DUP - Sample Duplicate

RPD - Relative Percent Difference

NC - Not Calculable.

SG - Silica Gel - Clean-Up

U - Indicates the compound was analyzed for, but not detected.

N-Nitrosodiphenylamine decomposes and cannot be separated from Diphenylamine using Method 8270. The result reported for each analyte is a combined concentration.

LABORATORIES

PASI-M	Pace Analytical Services - Minneapolis
PASI-MT	Pace Analytical Services - Montana

ANALYTE QUALIFIERS

D6	The relative percent difference (RPD) between the sample and sample duplicate exceeded laboratory control limits.
M1	Matrix spike recovery exceeded QC limits. Batch accepted based on laboratory control sample (LCS) recovery.
M6	Matrix spike and Matrix spike duplicate recovery not evaluated against control limits due to sample dilution.

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QUALITY CONTROL DATA CROSS REFERENCE TABLE

Project: Black Pine Mine REV
Pace Project No.: 10163640

Lab ID	Sample ID	QC Batch Method	QC Batch	Analytical Method	Analytical Batch
10163640001	**BP-CML-TS-04-00**	EPA 3050	MPRP/27167	EPA 6020	ICPM/11153
10163640002	**BP-CML-TS-04-02**	EPA 3050	MPRP/27167	EPA 6020	ICPM/11153
10163640003	**BP-CML-SS-04-06**	EPA 3050	MPRP/27167	EPA 6020	ICPM/11153
10163640004	**BP-CML-TS-05-00**	EPA 3050	MPRP/27167	EPA 6020	ICPM/11153
10163640005	**BP-CML-TS-05-02**	EPA 3050	MPRP/27235	EPA 6020	ICPM/11082
10163640006	**BP-CML-SS-05-04**	EPA 3050	MPRP/27235	EPA 6020	ICPM/11082
10163640007	**BP-CML-TS-06-00**	EPA 3050	MPRP/27235	EPA 6020	ICPM/11082
10163640008	**BP-CML-TS-06-02**	EPA 3050	MPRP/27235	EPA 6020	ICPM/11082
10163640009	**BP-CML-SS-06-05**	EPA 3050	MPRP/27235	EPA 6020	ICPM/11082
10163640001	**BP-CML-TS-04-00**	EPA 7471	MERP/5650	EPA 7471	MERC/6493
10163640002	**BP-CML-TS-04-02**	EPA 7471	MERP/5650	EPA 7471	MERC/6493
10163640003	**BP-CML-SS-04-06**	EPA 7471	MERP/5650	EPA 7471	MERC/6493
10163640004	**BP-CML-TS-05-00**	EPA 7471	MERP/5650	EPA 7471	MERC/6493
10163640005	**BP-CML-TS-05-02**	EPA 7471	MERP/5650	EPA 7471	MERC/6493
10163640006	**BP-CML-SS-05-04**	EPA 7471	MERP/5650	EPA 7471	MERC/6493
10163640007	**BP-CML-TS-06-00**	EPA 7471	MERP/5650	EPA 7471	MERC/6493
10163640008	**BP-CML-TS-06-02**	EPA 7471	MERP/5650	EPA 7471	MERC/6493
10163640009	**BP-CML-SS-06-05**	EPA 7471	MERP/5650	EPA 7471	MERC/6493
10163640001	**BP-CML-TS-04-00**	% Moisture	MPRP/27259		
10163640002	**BP-CML-TS-04-02**	% Moisture	MPRP/27259		
10163640003	**BP-CML-SS-04-06**	% Moisture	MPRP/27293		
10163640004	**BP-CML-TS-05-00**	% Moisture	MPRP/27293		
10163640005	**BP-CML-TS-05-02**	% Moisture	MPRP/27293		
10163640006	**BP-CML-SS-05-04**	% Moisture	MPRP/27293		
10163640007	**BP-CML-TS-06-00**	% Moisture	MPRP/27293		
10163640008	**BP-CML-TS-06-02**	% Moisture	MPRP/27293		
10163640009	**BP-CML-SS-06-05**	% Moisture	MPRP/27293		
10163640002	**BP-CML-TS-04-02**	Modified Sobek 3.2	MT/6497		
10163640005	**BP-CML-TS-05-02**	Modified Sobek 3.2	MT/6497		
10163640008	**BP-CML-TS-06-02**	Modified Sobek 3.2	MT/6497		
10163640002	**BP-CML-TS-04-02**	Modified Sobek 3.2	MT/6488		
10163640005	**BP-CML-TS-05-02**	Modified Sobek 3.2	MT/6488		
10163640008	**BP-CML-TS-06-02**	Modified Sobek 3.2	MT/6488		
10163640002	**BP-CML-TS-04-02**	Modified Sobek 3.2	MT/6501		
10163640005	**BP-CML-TS-05-02**	Modified Sobek 3.2	MT/6501		
10163640008	**BP-CML-TS-06-02**	Modified Sobek 3.2	MT/6501		
10163640002	**BP-CML-TS-04-02**	Modified Sobek 3.2	MT/6543		
10163640005	**BP-CML-TS-05-02**	Modified Sobek 3.2	MT/6543		
10163640008	**BP-CML-TS-06-02**	Modified Sobek 3.2	MT/6543		

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CHAIN-OF-CUSTODY / Analytical Request Document

The Chain-of-Custody is a LEGAL DOCUMENT. All relevant fields must be completed accurately.

Page: 1 of 1

1429909

Section A Required Client Information:	Section B Required Project Information:	Section C Invoice Information:
Company: Herrera	Report To: Kevin Hauck	Attention:
Address:	Copy To:	Company Name: DEQ
		Address:
Email To:	Purchase Order No.:	Pace Quote Reference:
Phone: Fax:	Project Name: Black Pine Mine	Pace Project Manager:
Requested Due Date/TAT:	Project Number:	Pace Profile #:

REGULATORY AGENCY

☐ NPDES ☐ GROUND WATER ☐ DRINKING WATER

☐ UST ☐ RCRA ☐ OTHER _____

Site Location STATE: _____

Section D Required Client Information

Matrix Codes — MATRIX / CODE: Drinking Water DW; Water WT; Waste Water WW; Product P; Soil/Solid SL; Oil OL; Wipe WP; Air AR; Tissue TS; Other OT

ITEM #	SAMPLE ID (A-Z, 0-9 / ,-) Sample IDs MUST BE UNIQUE	MATRIX CODE (see valid codes to left)	SAMPLE TYPE (G=GRAB C=COMP)	COLLECTED: COMPOSITE START DATE	COMPOSITE START TIME	COMPOSITE END/GRAB DATE	COMPOSITE END/GRAB TIME	SAMPLE TEMP AT COLLECTION	# OF CONTAINERS	Preservatives: Unpreserved	H_2SO_4	HNO_3	HCl	NaOH	$Na_2S_2O_3$	Methanol	Other	Requested Analysis Filtered (Y/N) Y/N	Analysis Test: Tot. Rec. Mct.	ABA	Moisture Content	Residual Chlorine (Y/N)	Pace Project No./ Lab I.D.
1	BP-CML-TS-04-00	SL	G			7/15/11	1105		1	X									X		X		001
2	BP-CML-TS-04-02	↓	↓			↓	1107		2	X									X	X	X		002
3	BP-CML-SS-04-06	↓	↓			↓	1110		1	X									X				003
4	BP-CML-TS-05-00	SL	G			7/15/11	1133		1	X									X		X		004
5	BP-CML-TS-05-02	↓	↓			↓	1135		2	X									X	X	X		005
6	BP-CML-SS-05-04	↓	↓			↓	1140		1	X									X				006
7	BP-CML-TS-06-00	SL	G			7/15/11	1210		1	X									X		X		007
8	BP-CML-TS-06-02	↓	↓			↓	1213		2	X									X	X	X		008
9	BP-CML-SS-06-05	↓	↓			↓	1215		1	X									X				009
10																							
11																							
12																							

10163640

ADDITIONAL COMMENTS	RELINQUISHED BY / AFFILIATION	DATE	TIME	ACCEPTED BY / AFFILIATION	DATE	TIME	SAMPLE CONDITIONS			
	Fedex BU pickup (E)	7/16/11	1130	[signature] Pace	7/16/11	1130	5.4	Y	Y	Y

ORIGINAL

SAMPLER NAME AND SIGNATURE

PRINT Name of SAMPLER: ALEX SWENSEN

SIGNATURE of SAMPLER: [signature] DATE Signed (MM/DD/YY): 7/15/11

Temp in °C | Received on Ice (Y/N) | Custody Sealed Cooler (Y/N) | Samples Intact (Y/N)

*Important Note: By signing this form you are accepting Pace's NET 30 day payment terms and agreeing to late charges of 1.5% per month for any invoices not paid within 30 days.

F-ALL-Q-020rev.07, 15-May-2007

Sample Condition Upon Receipt

Pace Analytical

Client Name: MDEQ - BLACK PINE Project # 10163640

Courier: [X] Fed Ex [ ] UPS [ ] USPS [ ] Client [ ] Commercial [ ] Pace Other _____

Tracking #: 876249308789

Custody Seal on Cooler/Box Present: [X] yes [ ] no Seals intact: [X] yes [ ] no

Packing Material: [ ] Bubble Wrap [X] Bubble Bags [ ] None [ ] Other _____ Temp Blank: Yes [X] No [ ]

Thermometer Used 383045 or 135 Type of Ice: (Wet) Blue None [X] Samples on ice, cooling process has begun

Cooler Temperature 5.8° Biological Tissue is Frozen: Yes No

Temp should be above freezing to 6°C

Date and Initials of person examining contents: NCT 7/17/14

Comments:

Chain of Custody Present:	[X]Yes [ ]No [ ]N/A	1.
Chain of Custody Filled Out:	[X]Yes [ ]No [ ]N/A	2.
Chain of Custody Relinquished:	[X]Yes [ ]No [ ]N/A	3.
Sampler Name & Signature on COC:	[X]Yes [ ]No [ ]N/A	4.
Samples Arrived within Hold Time:	[X]Yes [ ]No [ ]N/A	5.
Short Hold Time Analysis (<72hr):	[ ]Yes [X]No [ ]N/A	6.
Rush Turn Around Time Requested:	[ ]Yes [X]No [ ]N/A	7.
Sufficient Volume:	[X]Yes [ ]No [ ]N/A	8.
Correct Containers Used:	[X]Yes [ ]No [ ]N/A	9.
-Pace Containers Used:	[X]Yes [ ]No [ ]N/A	
Containers Intact:	[X]Yes [ ]No [ ]N/A	10.
Filtered volume received for Dissolved tests	[ ]Yes [ ]No [X]N/A	11.
Sample Labels match COC:	[X]Yes [ ]No [ ]N/A	12.
-Includes date/time/ID/Analysis Matrix: SOIL		
All containers needing acid/base preservation have been checked. Noncompliance are noted in 13.	[ ]Yes [ ]No [X]N/A	13. [ ] HNO3 [ ] H2SO4 [ ] NaOH [ ] HCl
All containers needing preservation are found to be in compliance with EPA recommendation.	[ ]Yes [ ]No [X]N/A	Samp #
Exceptions: VOA,Coliform, TOC, Oil and Grease, WI-DRO (water)	[ ]Yes [X]No	Initial when completed / Lot # of added preservative
Samples checked for dechlorination:	[ ]Yes [ ]No [X]N/A	14.
Headspace in VOA Vials (>6mm):	[ ]Yes [ ]No [X]N/A	15.
Trip Blank Present:	[ ]Yes [ ]No [X]N/A	16.
Trip Blank Custody Seals Present	[ ]Yes [ ]No [X]N/A	
Pace Trip Blank Lot # (if purchased):		

Client Notification/ Resolution: Field Data Required? Y / N

Person Contacted: _____ Date/Time: _____

Comments/ Resolution: _____

Project Manager Review: _____ **Date:** 7/17/14

Note: Whenever there is a discrepancy affecting North Carolina compliance samples, a copy of this form will be sent to the North Carolina DEHNR Certification Office (i.e out of hold, incorrect preservative, out of temp, incorrect containers)

Pace Analytical Services, Inc.
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(406)254-7226

October 18, 2011

Kevin Houck
Herrera Environmental Consultants
101 East Broadway, Suite 610
Missoula, MT 59802

RE: Project: Black Pine Mine REV
Pace Project No.: 10163643

Dear Kevin Houck:
Enclosed are the analytical results for sample(s) received by the laboratory on July 16, 2011. The results relate only to the samples included in this report.

This report has been revised to add Cobalt and delete Silver.

If you have any questions concerning this report, please feel free to contact me.

Sincerely,

Shawn Davis for
Sally Heinje
sally.heinje@pacelabs.com
Project Manager

Enclosures

cc: Devin Clary, Montana Dept. of Environmental Quality
Mark Donner, Trihydro
Jamie Mongoven, Montana Dept. of Environmental

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CERTIFICATIONS

Project: Black Pine Mine REV
Pace Project No.: 10163643

Minnesota Certification IDs

1700 Elm Street SE Suite 200, Minneapolis, MN 55414
A2LA Certification #: 2926.01
Alaska Certification #: UST-078
Alaska Certification #MN00064
Arizona Certification #: AZ-0014
Arkansas Certification #: 88-0680
California Certification #: 01155CA
EPA Region 8 Certification #: Pace
Florida/NELAP Certification #: E87605
Georgia Certification #: 959
Idaho Certification #: MN00064
Illinois Certification #: 200011
Iowa Certification #: 368
Kansas Certification #: E-10167
Louisiana Certification #: 03086
Louisiana Certification #: LA080009
Maine Certification #: 2007029
Maryland Certification #: 322
Michigan DEQ Certification #: 9909
Minnesota Certification #: 027-053-137
Mississippi Certification #: Pace
Montana Certification #: MT CERT0092
Nevada Certification #: MN_00064
Nebraska Certification #: Pace
New Jersey Certification #: MN-002
New Mexico Certification #: Pace
New York Certification #: 11647
North Carolina Certification #: 530
North Dakota Certification #: R-036
North Dakota Certification #: R-036A
Ohio VAP Certification #: CL101
Oklahoma Certification #: D9921
Oklahoma Certification #: 9507
Oregon Certification #: MN200001
Pennsylvania Certification #: 68-00563
Puerto Rico Certification
Tennessee Certification #: 02818
Texas Certification #: T104704192
Washington Certification #: C754
Wisconsin Certification #: 999407970

Montana Certification IDs

602 South 25th Street, Billings, MT 59101
EPA Region 8 Certification #: 8TMS-Q
Idaho Certification #: MT00012
Montana Certification #: MT CERT0040
NVLAP Certification #: 101292-0
Minnesota Dept of Health Certification #: 030-999-442

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SAMPLE SUMMARY

Project: Black Pine Mine REV
Pace Project No.: 10163643

Lab ID	Sample ID	Matrix	Date Collected	Date Received
10163643001	**BP-CML-TS-07-00**	Solid	07/15/11 12:32	07/16/11 11:30
10163643002	**BP-CML-TS-07-02**	Solid	07/15/11 12:35	07/16/11 11:30
10163643003	**BP-CML-SS-07-05**	Solid	07/15/11 12:37	07/16/11 11:30
10163643004	**BP-CML-TS-08-00**	Solid	07/15/11 12:55	07/16/11 11:30
10163643005	**BP-CML-TS-08-05**	Solid	07/15/11 12:58	07/16/11 11:30
10163643006	**BP-CML-SS-08-07**	Solid	07/15/11 13:00	07/16/11 11:30
10163643007	**BP-CML-TS-09-00**	Solid	07/15/11 13:35	07/16/11 11:30
10163643008	**BP-CML-TS-09-02**	Solid	07/15/11 13:37	07/16/11 11:30
10163643009	**BP-CML-TS-09-04**	Solid	07/15/11 13:39	07/16/11 11:30
10163643010	**BP-CML-TS-09-06**	Solid	07/15/11 13:40	07/16/11 11:30

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SAMPLE ANALYTE COUNT

Project: Black Pine Mine REV
Pace Project No.: 10163643

Lab ID	Sample ID	Method	Analysts	Analytes Reported	Laboratory
10163643001	**BP-CML-TS-07-00**	EPA 6020	TL1	12	PASI-M
		EPA 7471	TEM	1	PASI-M
		% Moisture	JDL	1	PASI-M
10163643002	**BP-CML-TS-07-02**	EPA 6020	TL1	12	PASI-M
		EPA 7471	TEM	1	PASI-M
		% Moisture	JDL	1	PASI-M
		Modified Sobek 3.2	JH1	1	PASI-MT
		Modified Sobek 3.2	JH1	5	PASI-MT
		Modified Sobek 3.2	JH1	4	PASI-MT
		Modified Sobek 3.2	JH1	1	PASI-MT
10163643003	**BP-CML-SS-07-05**	EPA 6020	TL1	12	PASI-M
		EPA 7471	TEM	1	PASI-M
		% Moisture	JDL	1	PASI-M
10163643004	**BP-CML-TS-08-00**	EPA 6020	TL1	12	PASI-M
		EPA 7471	TEM	1	PASI-M
		% Moisture	JDL	1	PASI-M
10163643005	**BP-CML-TS-08-05**	EPA 6020	TL1	12	PASI-M
		EPA 7471	TEM	1	PASI-M
		% Moisture	JDL	1	PASI-M
		Modified Sobek 3.2	JH1	1	PASI-MT
		Modified Sobek 3.2	JH1	5	PASI-MT
		Modified Sobek 3.2	JH1	4	PASI-MT
		Modified Sobek 3.2	JH1	1	PASI-MT
10163643006	**BP-CML-SS-08-07**	EPA 6020	TL1	12	PASI-M
		EPA 7471	TEM	1	PASI-M
		% Moisture	JDL	1	PASI-M
10163643007	**BP-CML-TS-09-00**	EPA 6020	CJS, TL1	12	PASI-M
		EPA 7471	TEM	1	PASI-M
		% Moisture	JDL	1	PASI-M
10163643008	**BP-CML-TS-09-02**	EPA 6020	TL1	12	PASI-M
		EPA 7471	TEM	1	PASI-M
		% Moisture	JDL	1	PASI-M
10163643009	**BP-CML-TS-09-04**	EPA 6020	TL1	12	PASI-M
		EPA 7471	TEM	1	PASI-M
		% Moisture	JDL	1	PASI-M
10163643010	**BP-CML-TS-09-06**	EPA 6020	TL1	12	PASI-M
		EPA 7471	TEM	1	PASI-M

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SAMPLE ANALYTE COUNT

Project: Black Pine Mine REV
Pace Project No.: 10163643

Lab ID	Sample ID	Method	Analysts	Analytes Reported	Laboratory
		% Moisture	JDL	1	PASI-M

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PROJECT NARRATIVE

Project: Black Pine Mine REV
Pace Project No.: 10163643

Method: **EPA 6020**
Description: 6020 MET ICPMS
Client: Montana Dept. of Environmental Quality
Date: October 18, 2011

General Information:
10 samples were analyzed for EPA 6020. All samples were received in acceptable condition with any exceptions noted below.

Hold Time:
The samples were analyzed within the method required hold times with any exceptions noted below.

Sample Preparation:
The samples were prepared in accordance with EPA 3050 with any exceptions noted below.

Initial Calibrations (including MS Tune as applicable):
All criteria were within method requirements with any exceptions noted below.

Continuing Calibration:
All criteria were within method requirements with any exceptions noted below.

Internal Standards:
All internal standards were within QC limits with any exceptions noted below.

Method Blank:
All analytes were below the report limit in the method blank with any exceptions noted below.

Laboratory Control Spike:
All laboratory control spike compounds were within QC limits with any exceptions noted below.

Matrix Spikes:
All percent recoveries and relative percent differences (RPDs) were within acceptance criteria with any exceptions noted below.

QC Batch: MPRP/27164

A matrix spike and matrix spike duplicate (MS/MSD) were performed on the following sample(s): 10163643001,10163644001

M6: Matrix spike and Matrix spike duplicate recovery not evaluated against control limits due to sample dilution.

- MS (Lab ID: 1014840)
  - Antimony
  - Arsenic
  - Barium
  - Copper
  - Iron
  - Lead
  - Manganese
  - Zinc
- MS (Lab ID: 1014842)
  - Antimony
  - Arsenic
  - Barium
  - Copper

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PROJECT NARRATIVE

Project: Black Pine Mine REV
Pace Project No.: 10163643

Method: **EPA 6020**
Description: 6020 MET ICPMS
Client: Montana Dept. of Environmental Quality
Date: October 18, 2011

QC Batch: MPRP/27164

A matrix spike and matrix spike duplicate (MS/MSD) were performed on the following sample(s): 10163643001,10163644001

M6: Matrix spike and Matrix spike duplicate recovery not evaluated against control limits due to sample dilution.

- Iron
- Lead
- Manganese
- Zinc

- MSD (Lab ID: 1014841)
  - Antimony
  - Arsenic
  - Barium
  - Copper
  - Iron
  - Lead
  - Manganese
  - Nickel
  - Zinc

Duplicate Sample:
All duplicate sample results were within method acceptance criteria with any exceptions noted below.

Additional Comments:

Analyte Comments:

QC Batch: MPRP/27164

E: Analyte concentration exceeded the calibration range. The reported result is estimated.

- MS (Lab ID: 1014840)
  - Copper
  - Lead
- MSD (Lab ID: 1014841)
  - Lead

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PROJECT NARRATIVE

Project: Black Pine Mine REV
Pace Project No.: 10163643

Method: **EPA 7471**
Description: 7471 Mercury
Client: Montana Dept. of Environmental Quality
Date: October 18, 2011

General Information:
10 samples were analyzed for EPA 7471. All samples were received in acceptable condition with any exceptions noted below.

Hold Time:
The samples were analyzed within the method required hold times with any exceptions noted below.

Sample Preparation:
The samples were prepared in accordance with EPA 7471 with any exceptions noted below.

Initial Calibrations (including MS Tune as applicable):
All criteria were within method requirements with any exceptions noted below.

Continuing Calibration:
All criteria were within method requirements with any exceptions noted below.

Method Blank:
All analytes were below the report limit in the method blank with any exceptions noted below.

Laboratory Control Spike:
All laboratory control spike compounds were within QC limits with any exceptions noted below.

Matrix Spikes:
All percent recoveries and relative percent differences (RPDs) were within acceptance criteria with any exceptions noted below.

QC Batch: MERP/5651

A matrix spike and matrix spike duplicate (MS/MSD) were performed on the following sample(s): 10163643010,10163645009

M1: Matrix spike recovery exceeded QC limits. Batch accepted based on laboratory control sample (LCS) recovery.

- MS (Lab ID: 1016616)
  - Mercury

M6: Matrix spike and Matrix spike duplicate recovery not evaluated against control limits due to sample dilution.

- MS (Lab ID: 1016614)
  - Mercury
- MSD (Lab ID: 1016615)
  - Mercury

QC Batch: MERP/5650

A matrix spike and matrix spike duplicate (MS/MSD) were performed on the following sample(s): 10163634009,10163643009

M1: Matrix spike recovery exceeded QC limits. Batch accepted based on laboratory control sample (LCS) recovery.

- MS (Lab ID: 1016609)
  - Mercury
- MSD (Lab ID: 1016610)
  - Mercury

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PROJECT NARRATIVE

Project: Black Pine Mine REV
Pace Project No.: 10163643

Method: **EPA 7471**
Description: 7471 Mercury
Client: Montana Dept. of Environmental Quality
Date: October 18, 2011

QC Batch: MERP/5650

A matrix spike and matrix spike duplicate (MS/MSD) were performed on the following sample(s): 10163634009,10163643009

M6: Matrix spike and Matrix spike duplicate recovery not evaluated against control limits due to sample dilution.

- MS (Lab ID: 1016611)
  - Mercury

Duplicate Sample:
All duplicate sample results were within method acceptance criteria with any exceptions noted below.

Additional Comments:

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PROJECT NARRATIVE

Project: Black Pine Mine REV
Pace Project No.: 10163643

Method: **Modified Sobek 3.2**
Description: Sobek Acid Base Potential
Client: Montana Dept. of Environmental Quality
Date: October 18, 2011

General Information:
2 samples were analyzed for Modified Sobek 3.2. All samples were received in acceptable condition with any exceptions noted below.

Hold Time:
The samples were analyzed within the method required hold times with any exceptions noted below.

Initial Calibrations (including MS Tune as applicable):
All criteria were within method requirements with any exceptions noted below.

Continuing Calibration:
All criteria were within method requirements with any exceptions noted below.

Internal Standards:
All internal standards were within QC limits with any exceptions noted below.

Surrogates:
All surrogates were within QC limits with any exceptions noted below.

Method Blank:
All analytes were below the report limit in the method blank with any exceptions noted below.

Laboratory Control Spike:
All laboratory control spike compounds were within QC limits with any exceptions noted below.

Matrix Spikes:
All percent recoveries and relative percent differences (RPDs) were within acceptance criteria with any exceptions noted below.

Duplicate Sample:
All duplicate sample results were within method acceptance criteria with any exceptions noted below.

Additional Comments:

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PROJECT NARRATIVE

Project: Black Pine Mine REV
Pace Project No.: 10163643

Method: **Modified Sobek 3.2**
Description: Sobek Extractable Sulfur
Client: Montana Dept. of Environmental Quality
Date: October 18, 2011

General Information:
2 samples were analyzed for Modified Sobek 3.2. All samples were received in acceptable condition with any exceptions noted below.

Hold Time:
The samples were analyzed within the method required hold times with any exceptions noted below.

Initial Calibrations (including MS Tune as applicable):
All criteria were within method requirements with any exceptions noted below.

Continuing Calibration:
All criteria were within method requirements with any exceptions noted below.

Internal Standards:
All internal standards were within QC limits with any exceptions noted below.

Surrogates:
All surrogates were within QC limits with any exceptions noted below.

Method Blank:
All analytes were below the report limit in the method blank with any exceptions noted below.

Laboratory Control Spike:
All laboratory control spike compounds were within QC limits with any exceptions noted below.

Matrix Spikes:
All percent recoveries and relative percent differences (RPDs) were within acceptance criteria with any exceptions noted below.

Duplicate Sample:
All duplicate sample results were within method acceptance criteria with any exceptions noted below.

Additional Comments:

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PROJECT NARRATIVE

Project: Black Pine Mine REV
Pace Project No.: 10163643

Method: **Modified Sobek 3.2**
Description: Sobek Calculations
Client: Montana Dept. of Environmental Quality
Date: October 18, 2011

General Information:
2 samples were analyzed for Modified Sobek 3.2. All samples were received in acceptable condition with any exceptions noted below.

Hold Time:
The samples were analyzed within the method required hold times with any exceptions noted below.

Initial Calibrations (including MS Tune as applicable):
All criteria were within method requirements with any exceptions noted below.

Continuing Calibration:
All criteria were within method requirements with any exceptions noted below.

Internal Standards:
All internal standards were within QC limits with any exceptions noted below.

Surrogates:
All surrogates were within QC limits with any exceptions noted below.

Method Blank:
All analytes were below the report limit in the method blank with any exceptions noted below.

Laboratory Control Spike:
All laboratory control spike compounds were within QC limits with any exceptions noted below.

Matrix Spikes:
All percent recoveries and relative percent differences (RPDs) were within acceptance criteria with any exceptions noted below.

Duplicate Sample:
All duplicate sample results were within method acceptance criteria with any exceptions noted below.

Additional Comments:

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PROJECT NARRATIVE

Project: Black Pine Mine REV
Pace Project No.: 10163643

Method: **Modified Sobek 3.2**
Description: Sobek SMP Buffer pH
Client: Montana Dept. of Environmental Quality
Date: October 18, 2011

General Information:
2 samples were analyzed for Modified Sobek 3.2. All samples were received in acceptable condition with any exceptions noted below.

Hold Time:
The samples were analyzed within the method required hold times with any exceptions noted below.

Initial Calibrations (including MS Tune as applicable):
All criteria were within method requirements with any exceptions noted below.

Continuing Calibration:
All criteria were within method requirements with any exceptions noted below.

Internal Standards:
All internal standards were within QC limits with any exceptions noted below.

Surrogates:
All surrogates were within QC limits with any exceptions noted below.

Method Blank:
All analytes were below the report limit in the method blank with any exceptions noted below.

Laboratory Control Spike:
All laboratory control spike compounds were within QC limits with any exceptions noted below.

Matrix Spikes:
All percent recoveries and relative percent differences (RPDs) were within acceptance criteria with any exceptions noted below.

Duplicate Sample:
All duplicate sample results were within method acceptance criteria with any exceptions noted below.

Additional Comments:

This data package has been reviewed for quality and completeness and is approved for release.

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ANALYTICAL RESULTS

Project: Black Pine Mine REV
Pace Project No.: 10163643

Sample: BP-CML-TS-07-00 **Lab ID: 10163643001** Collected: 07/15/11 12:32 Received: 07/16/11 11:30 Matrix: Solid

Results reported on a "dry-weight" basis

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
6020 MET ICPMS	Analytical Method: EPA 6020 Preparation Method: EPA 3050							
Antimony	**529**	mg/kg	2.5	100	07/25/11 09:00	07/29/11 19:03	7440-36-0	M6
Arsenic	**496**	mg/kg	2.5	100	07/25/11 09:00	07/29/11 19:03	7440-38-2	M6
Barium	**289**	mg/kg	0.30	20	07/25/11 09:00	07/29/11 18:59	7440-39-3	M6
Cadmium	**7.5**	mg/kg	0.080	20	07/25/11 09:00	07/29/11 18:59	7440-43-9	
Chromium	**3.7**	mg/kg	0.50	20	07/25/11 09:00	07/29/11 18:59	7440-47-3	
Cobalt	**4.3**	mg/kg	0.50	20	07/25/11 09:00	07/29/11 18:59	7440-48-4	
Copper	**1110**	mg/kg	2.5	100	07/25/11 09:00	07/29/11 19:03	7440-50-8	M6
Iron	**27600**	mg/kg	249	100	07/25/11 09:00	07/29/11 19:03	7439-89-6	M6
Lead	**2650**	mg/kg	1.0	200	07/25/11 09:00	07/30/11 19:59	7439-92-1	M6
Manganese	**315**	mg/kg	0.50	20	07/25/11 09:00	07/29/11 18:59	7439-96-5	M6
Nickel	**9.3**	mg/kg	2.5	100	07/25/11 09:00	07/29/11 19:03	7440-02-0	M6
Zinc	**250**	mg/kg	24.9	100	07/25/11 09:00	07/29/11 19:03	7440-66-6	M6
7471 Mercury	Analytical Method: EPA 7471 Preparation Method: EPA 7471							
Mercury	**215**	mg/kg	6.1	250	07/28/11 16:35	07/31/11 10:43	7439-97-6	
Dry Weight	Analytical Method: % Moisture							
Percent Moisture	**20.4**	%	0.10	1		07/25/11 00:00		

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ANALYTICAL RESULTS

Project: Black Pine Mine REV
Pace Project No.: 10163643

Sample: BP-CML-TS-07-02 **Lab ID: 10163643002** Collected: 07/15/11 12:35 Received: 07/16/11 11:30 Matrix: Solid

Results reported on a "dry-weight" basis

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
6020 MET ICPMS	Analytical Method: EPA 6020 Preparation Method: EPA 3050							
Antimony	**690**	mg/kg	2.6	100	07/25/11 09:00	07/29/11 19:10	7440-36-0	
Arsenic	**633**	mg/kg	2.6	100	07/25/11 09:00	07/29/11 19:10	7440-38-2	
Barium	**207**	mg/kg	0.31	20	07/25/11 09:00	07/29/11 19:06	7440-39-3	
Cadmium	**12.5**	mg/kg	0.084	20	07/25/11 09:00	07/29/11 19:06	7440-43-9	
Chromium	**<0.52**	mg/kg	0.52	20	07/25/11 09:00	07/29/11 19:06	7440-47-3	
Cobalt	**0.93**	mg/kg	0.52	20	07/25/11 09:00	07/29/11 19:06	7440-48-4	
Copper	**941**	mg/kg	2.6	100	07/25/11 09:00	07/29/11 19:10	7440-50-8	
Iron	**15500**	mg/kg	52.4	20	07/25/11 09:00	07/29/11 19:06	7439-89-6	
Lead	**3290**	mg/kg	1.0	200	07/25/11 09:00	07/30/11 20:03	7439-92-1	
Manganese	**289**	mg/kg	0.52	20	07/25/11 09:00	07/29/11 19:06	7439-96-5	
Nickel	**1.6**	mg/kg	0.52	20	07/25/11 09:00	07/29/11 19:06	7440-02-0	
Zinc	**334**	mg/kg	5.2	20	07/25/11 09:00	07/29/11 19:06	7440-66-6	
7471 Mercury	Analytical Method: EPA 7471 Preparation Method: EPA 7471							
Mercury	**221**	mg/kg	5.4	250	07/28/11 16:35	07/31/11 10:55	7439-97-6	
Dry Weight	Analytical Method: % Moisture							
Percent Moisture	**8.2**	%	0.10	1		07/25/11 00:00		
Sobek Acid Base Potential	Analytical Method: Modified Sobek 3.2							
Neutralization Potential	**0.73**	tons/1000	0.50	1		08/01/11 00:00		
Sobek Extractable Sulfur	Analytical Method: Modified Sobek 3.2							
Sulfur, HCl Extractable	**<0.050**	% (w/w)	0.050	1		08/09/11 09:58		
Sulfur, HNO3 Extractable	**<0.050**	% (w/w)	0.050	1		08/09/11 09:58		
Sulfur, Hot Water Extractable	**<0.050**	% (w/w)	0.050	1		08/09/11 09:58		
Sulfur, Residual	**<0.050**	% (w/w)	0.050	1		08/09/11 09:58		
Total Sulfur	**0.0530**	% (w/w)	0.050	1		08/09/11 09:58		
Sobek Calculations	Analytical Method: Modified Sobek 3.2							
Acid/Base Potential	**0.73**	tons/1000		1		08/01/11 00:00		
Acid Potential	**<4.3**	tons/1000	4.3	1		08/01/11 00:00		
Lime Requirement	**<5.4**	tons/1000	5.4	1		08/01/11 00:00		
SMP Lime Requirement	**0**	tons/1000	0.0	1		08/01/11 00:00		
Sobek SMP Buffer pH	Analytical Method: Modified Sobek 3.2							
SMP Buffer pH	**7.3**	Std. Units	0.10	1		07/29/11 13:24		

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ANALYTICAL RESULTS

Project: Black Pine Mine REV
Pace Project No.: 10163643

Sample: BP-CML-SS-07-05 **Lab ID: 10163643003** Collected: 07/15/11 12:37 Received: 07/16/11 11:30 Matrix: Solid

Results reported on a "dry-weight" basis

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
6020 MET ICPMS	Analytical Method: EPA 6020 Preparation Method: EPA 3050							
Antimony	**30.3**	mg/kg	0.43	20	07/25/11 09:00	07/29/11 19:13	7440-36-0	
Arsenic	**39.5**	mg/kg	0.43	20	07/25/11 09:00	07/29/11 19:13	7440-38-2	
Barium	**151**	mg/kg	0.26	20	07/25/11 09:00	07/29/11 19:13	7440-39-3	
Cadmium	**1.5**	mg/kg	0.069	20	07/25/11 09:00	07/29/11 19:13	7440-43-9	
Chromium	**5.2**	mg/kg	0.43	20	07/25/11 09:00	07/29/11 19:13	7440-47-3	
Cobalt	**43.1**	mg/kg	0.43	20	07/25/11 09:00	07/29/11 19:13	7440-48-4	
Copper	**231**	mg/kg	0.43	20	07/25/11 09:00	07/29/11 19:13	7440-50-8	
Iron	**22400**	mg/kg	216	100	07/25/11 09:00	07/29/11 19:17	7439-89-6	
Lead	**167**	mg/kg	0.086	20	07/25/11 09:00	07/29/11 19:13	7439-92-1	
Manganese	**1600**	mg/kg	2.2	100	07/25/11 09:00	07/29/11 19:17	7439-96-5	
Nickel	**8.0**	mg/kg	0.43	20	07/25/11 09:00	07/29/11 19:13	7440-02-0	
Zinc	**80.7**	mg/kg	4.3	20	07/25/11 09:00	07/29/11 19:13	7440-66-6	
7471 Mercury	Analytical Method: EPA 7471 Preparation Method: EPA 7471							
Mercury	**67.5**	mg/kg	5.2	250	07/28/11 16:35	07/31/11 11:02	7439-97-6	
Dry Weight	Analytical Method: % Moisture							
Percent Moisture	**13.1**	%	0.10	1		07/25/11 00:00		

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ANALYTICAL RESULTS

Project: Black Pine Mine REV
Pace Project No.: 10163643

Sample: BP-CML-TS-08-00 **Lab ID: 10163643004** Collected: 07/15/11 12:55 Received: 07/16/11 11:30 Matrix: Solid

Results reported on a "dry-weight" basis

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
6020 MET ICPMS	Analytical Method: EPA 6020 Preparation Method: EPA 3050							
Antimony	**233**	mg/kg	0.47	20	07/25/11 09:00	07/29/11 19:41	7440-36-0	
Arsenic	**188**	mg/kg	0.47	20	07/25/11 09:00	07/29/11 19:41	7440-38-2	
Barium	**146**	mg/kg	0.28	20	07/25/11 09:00	07/29/11 19:41	7440-39-3	
Cadmium	**4.3**	mg/kg	0.075	20	07/25/11 09:00	07/29/11 19:41	7440-43-9	
Chromium	**2.8**	mg/kg	0.47	20	07/25/11 09:00	07/29/11 19:41	7440-47-3	
Cobalt	**2.3**	mg/kg	0.47	20	07/25/11 09:00	07/29/11 19:41	7440-48-4	
Copper	**687**	mg/kg	1.2	50	07/25/11 09:00	07/30/11 20:06	7440-50-8	
Iron	**16000**	mg/kg	46.9	20	07/25/11 09:00	07/29/11 19:41	7439-89-6	
Lead	**1290**	mg/kg	0.47	100	07/25/11 09:00	07/29/11 19:45	7439-92-1	
Manganese	**183**	mg/kg	0.47	20	07/25/11 09:00	07/29/11 19:41	7439-96-5	
Nickel	**3.4**	mg/kg	0.47	20	07/25/11 09:00	07/29/11 19:41	7440-02-0	
Zinc	**118**	mg/kg	4.7	20	07/25/11 09:00	07/29/11 19:41	7440-66-6	
7471 Mercury	Analytical Method: EPA 7471 Preparation Method: EPA 7471							
Mercury	**10.8**	mg/kg	0.56	25	07/28/11 16:35	07/31/11 11:04	7439-97-6	
Dry Weight	Analytical Method: % Moisture							
Percent Moisture	**25.4**	%	0.10	1		07/25/11 00:00		

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ANALYTICAL RESULTS

Project: Black Pine Mine REV
Pace Project No.: 10163643

Sample: BP-CML-TS-08-05 **Lab ID: 10163643005** Collected: 07/15/11 12:58 Received: 07/16/11 11:30 Matrix: Solid

Results reported on a "dry-weight" basis

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
6020 MET ICPMS	Analytical Method: EPA 6020 Preparation Method: EPA 3050							
Antimony	**360**	mg/kg	0.52	20	07/25/11 09:00	07/29/11 19:48	7440-36-0	
Arsenic	**340**	mg/kg	0.52	20	07/25/11 09:00	07/29/11 19:48	7440-38-2	
Barium	**337**	mg/kg	0.31	20	07/25/11 09:00	07/29/11 19:48	7440-39-3	
Cadmium	**8.2**	mg/kg	0.083	20	07/25/11 09:00	07/29/11 19:48	7440-43-9	
Chromium	**<0.52**	mg/kg	0.52	20	07/25/11 09:00	07/29/11 19:48	7440-47-3	
Cobalt	**4.2**	mg/kg	0.52	20	07/25/11 09:00	07/29/11 19:48	7440-48-4	
Copper	**1610**	mg/kg	5.2	200	07/25/11 09:00	07/30/11 20:13	7440-50-8	
Iron	**26600**	mg/kg	520	200	07/25/11 09:00	07/30/11 20:13	7439-89-6	
Lead	**2990**	mg/kg	1.0	200	07/25/11 09:00	07/30/11 20:13	7439-92-1	
Manganese	**1120**	mg/kg	5.2	200	07/25/11 09:00	07/30/11 20:13	7439-96-5	
Nickel	**3.7**	mg/kg	0.52	20	07/25/11 09:00	07/29/11 19:48	7440-02-0	
Zinc	**194**	mg/kg	5.2	20	07/25/11 09:00	07/29/11 19:48	7440-66-6	
7471 Mercury	Analytical Method: EPA 7471 Preparation Method: EPA 7471							
Mercury	**7.4**	mg/kg	0.76	25	07/28/11 16:35	07/31/11 11:06	7439-97-6	
Dry Weight	Analytical Method: % Moisture							
Percent Moisture	**34.5**	%	0.10	1		07/25/11 00:00		
Sobek Acid Base Potential	Analytical Method: Modified Sobek 3.2							
Neutralization Potential	**8.3**	tons/1000	0.50	1		08/01/11 00:00		
Sobek Extractable Sulfur	Analytical Method: Modified Sobek 3.2							
Sulfur, HCl Extractable	**<0.050**	% (w/w)	0.050	1		08/09/11 10:34		
Sulfur, HNO3 Extractable	**<0.050**	% (w/w)	0.050	1		08/09/11 10:34		
Sulfur, Hot Water Extractable	**<0.050**	% (w/w)	0.050	1		08/09/11 10:34		
Sulfur, Residual	**<0.050**	% (w/w)	0.050	1		08/09/11 10:34		
Total Sulfur	**0.0605**	% (w/w)	0.050	1		08/09/11 10:34		
Sobek Calculations	Analytical Method: Modified Sobek 3.2							
Acid/Base Potential	**8.3**	tons/1000		1		08/01/11 00:00		
Acid Potential	**<4.3**	tons/1000	4.3	1		08/01/11 00:00		
Lime Requirement	**<5.4**	tons/1000	5.4	1		08/01/11 00:00		
SMP Lime Requirement	**0**	tons/1000	0.0	1		08/01/11 00:00		
Sobek SMP Buffer pH	Analytical Method: Modified Sobek 3.2							
SMP Buffer pH	**7.1**	Std. Units	0.10	1		07/29/11 13:24		

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ANALYTICAL RESULTS

Project: Black Pine Mine REV
Pace Project No.: 10163643

Sample: BP-CML-SS-08-07 **Lab ID: 10163643006** Collected: 07/15/11 13:00 Received: 07/16/11 11:30 Matrix: Solid

Results reported on a "dry-weight" basis

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
6020 MET ICPMS	Analytical Method: EPA 6020 Preparation Method: EPA 3050							
Antimony	**1.9**	mg/kg	0.56	20	07/25/11 09:00	07/29/11 19:55	7440-36-0	
Arsenic	**8.3**	mg/kg	0.56	20	07/25/11 09:00	07/29/11 19:55	7440-38-2	
Barium	**156**	mg/kg	0.33	20	07/25/11 09:00	07/29/11 19:55	7440-39-3	
Cadmium	**0.12**	mg/kg	0.089	20	07/25/11 09:00	07/29/11 19:55	7440-43-9	
Chromium	**5.4**	mg/kg	0.56	20	07/25/11 09:00	07/29/11 19:55	7440-47-3	
Cobalt	**14.4**	mg/kg	0.56	20	07/25/11 09:00	07/29/11 19:55	7440-48-4	
Copper	**35.1**	mg/kg	0.56	20	07/25/11 09:00	07/29/11 19:55	7440-50-8	
Iron	**18800**	mg/kg	55.5	20	07/25/11 09:00	07/29/11 19:55	7439-89-6	
Lead	**20.1**	mg/kg	0.11	20	07/25/11 09:00	07/29/11 19:55	7439-92-1	
Manganese	**457**	mg/kg	0.56	20	07/25/11 09:00	07/29/11 19:55	7439-96-5	
Nickel	**7.0**	mg/kg	0.56	20	07/25/11 09:00	07/29/11 19:55	7440-02-0	
Zinc	**178**	mg/kg	5.6	20	07/25/11 09:00	07/29/11 19:55	7440-66-6	
7471 Mercury	Analytical Method: EPA 7471 Preparation Method: EPA 7471							
Mercury	**130**	mg/kg	6.5	250	07/28/11 16:35	07/31/11 11:14	7439-97-6	
Dry Weight	Analytical Method: % Moisture							
Percent Moisture	**23.7**	%	0.10	1		07/25/11 00:00		

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ANALYTICAL RESULTS

Project: Black Pine Mine REV
Pace Project No.: 10163643

Sample: BP-CML-TS-09-00 **Lab ID: 10163643007** Collected: 07/15/11 13:35 Received: 07/16/11 11:30 Matrix: Solid

Results reported on a "dry-weight" basis

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
6020 MET ICPMS	Analytical Method: EPA 6020 Preparation Method: EPA 3050							
Antimony	**3210**	mg/kg	6.4	200	07/25/11 09:00	07/30/11 20:20	7440-36-0	
Arsenic	**2440**	mg/kg	3.2	100	07/25/11 09:00	07/29/11 20:06	7440-38-2	
Barium	**424**	mg/kg	0.39	20	07/25/11 09:00	07/29/11 20:02	7440-39-3	
Cadmium	**49.2**	mg/kg	0.10	20	07/25/11 09:00	07/29/11 20:02	7440-43-9	
Chromium	**<0.64**	mg/kg	0.64	20	07/25/11 09:00	07/29/11 20:02	7440-47-3	
Cobalt	**4.8**	mg/kg	0.64	20	07/25/11 09:00	07/29/11 20:02	7440-48-4	
Copper	**6630**	mg/kg	12.8	400	07/25/11 09:00	07/31/11 14:39	7440-50-8	
Iron	**52500**	mg/kg	321	100	07/25/11 09:00	07/29/11 20:06	7439-89-6	
Lead	**9520**	mg/kg	2.6	400	07/25/11 09:00	07/31/11 14:39	7439-92-1	
Manganese	**439**	mg/kg	0.64	20	07/25/11 09:00	07/29/11 20:02	7439-96-5	
Nickel	**6.2**	mg/kg	0.64	20	07/25/11 09:00	07/29/11 20:02	7440-02-0	
Zinc	**1110**	mg/kg	32.1	100	07/25/11 09:00	07/29/11 20:06	7440-66-6	
7471 Mercury	Analytical Method: EPA 7471 Preparation Method: EPA 7471							
Mercury	**<0.024**	mg/kg	0.024	1	07/28/11 16:35	07/31/11 11:30	7439-97-6	
Dry Weight	Analytical Method: % Moisture							
Percent Moisture	**34.5**	%	0.10	1		07/25/11 00:00		

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ANALYTICAL RESULTS

Project: Black Pine Mine REV
Pace Project No.: 10163643

Sample: BP-CML-TS-09-02 **Lab ID: 10163643008** Collected: 07/15/11 13:37 Received: 07/16/11 11:30 Matrix: Solid

Results reported on a "dry-weight" basis

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
6020 MET ICPMS	Analytical Method: EPA 6020 Preparation Method: EPA 3050							
Antimony	**1280**	mg/kg	2.5	100	07/25/11 09:00	07/29/11 20:13	7440-36-0	
Arsenic	**5140**	mg/kg	9.8	400	07/25/11 09:00	07/30/11 20:24	7440-38-2	
Barium	**464**	mg/kg	1.5	100	07/25/11 09:00	07/29/11 20:13	7440-39-3	
Cadmium	**13.2**	mg/kg	0.079	20	07/25/11 09:00	07/29/11 20:09	7440-43-9	
Chromium	**<0.49**	mg/kg	0.49	20	07/25/11 09:00	07/29/11 20:09	7440-47-3	
Cobalt	**2.5**	mg/kg	0.49	20	07/25/11 09:00	07/29/11 20:09	7440-48-4	
Copper	**3120**	mg/kg	9.8	400	07/25/11 09:00	07/30/11 20:24	7440-50-8	
Iron	**60700**	mg/kg	246	100	07/25/11 09:00	07/29/11 20:13	7439-89-6	
Lead	**23600**	mg/kg	4.9	1000	07/25/11 09:00	07/30/11 20:27	7439-92-1	
Manganese	**84.4**	mg/kg	0.49	20	07/25/11 09:00	07/29/11 20:09	7439-96-5	
Nickel	**3.6**	mg/kg	0.49	20	07/25/11 09:00	07/29/11 20:09	7440-02-0	
Zinc	**122**	mg/kg	4.9	20	07/25/11 09:00	07/29/11 20:09	7440-66-6	
7471 Mercury	Analytical Method: EPA 7471 Preparation Method: EPA 7471							
Mercury	**0.64**	mg/kg	0.54	25	07/28/11 16:35	07/31/11 11:32	7439-97-6	
Dry Weight	Analytical Method: % Moisture							
Percent Moisture	**18.6**	%	0.10	1		07/25/11 00:00		

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ANALYTICAL RESULTS

Project: Black Pine Mine REV
Pace Project No.: 10163643

Sample: BP-CML-TS-09-04 **Lab ID: 10163643009** Collected: 07/15/11 13:39 Received: 07/16/11 11:30 Matrix: Solid

Results reported on a "dry-weight" basis

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
6020 MET ICPMS	Analytical Method: EPA 6020 Preparation Method: EPA 3050							
Antimony	**2540**	mg/kg	10.7	400	07/25/11 09:00	07/30/11 20:31	7440-36-0	
Arsenic	**4980**	mg/kg	10.7	400	07/25/11 09:00	07/30/11 20:31	7440-38-2	
Barium	**315**	mg/kg	0.32	20	07/25/11 09:00	07/29/11 20:27	7440-39-3	
Cadmium	**35.2**	mg/kg	0.086	20	07/25/11 09:00	07/29/11 20:27	7440-43-9	
Chromium	**<0.54**	mg/kg	0.54	20	07/25/11 09:00	07/29/11 20:27	7440-47-3	
Cobalt	**1.7**	mg/kg	0.54	20	07/25/11 09:00	07/29/11 20:27	7440-48-4	
Copper	**5580**	mg/kg	10.7	400	07/25/11 09:00	07/30/11 20:31	7440-50-8	
Iron	**67700**	mg/kg	269	100	07/25/11 09:00	07/29/11 20:30	7439-89-6	
Lead	**15100**	mg/kg	5.4	1000	07/25/11 09:00	07/30/11 20:55	7439-92-1	
Manganese	**234**	mg/kg	0.54	20	07/25/11 09:00	07/29/11 20:27	7439-96-5	
Nickel	**2.2**	mg/kg	0.54	20	07/25/11 09:00	07/29/11 20:27	7440-02-0	
Zinc	**273**	mg/kg	5.4	20	07/25/11 09:00	07/29/11 20:27	7440-66-6	
7471 Mercury	Analytical Method: EPA 7471 Preparation Method: EPA 7471							
Mercury	**137**	mg/kg	5.1	250	07/28/11 16:35	07/31/11 11:40	7439-97-6	M6
Dry Weight	Analytical Method: % Moisture							
Percent Moisture	**16.2**	%	0.10	1		07/25/11 00:00		

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ANALYTICAL RESULTS

Project: Black Pine Mine REV
Pace Project No.: 10163643

Sample: BP-CML-TS-09-06 **Lab ID: 10163643010** Collected: 07/15/11 13:40 Received: 07/16/11 11:30 Matrix: Solid

Results reported on a "dry-weight" basis

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
6020 MET ICPMS	Analytical Method: EPA 6020 Preparation Method: EPA 3050							
Antimony	**15700**	mg/kg	27.8	1000	07/25/11 09:00	07/30/11 21:02	7440-36-0	
Arsenic	**4200**	mg/kg	11.1	400	07/25/11 09:00	07/30/11 20:59	7440-38-2	
Barium	**390**	mg/kg	0.33	20	07/25/11 09:00	07/29/11 20:34	7440-39-3	
Cadmium	**99.9**	mg/kg	0.089	20	07/25/11 09:00	07/29/11 20:34	7440-43-9	
Chromium	**<0.56**	mg/kg	0.56	20	07/25/11 09:00	07/29/11 20:34	7440-47-3	
Cobalt	**14.6**	mg/kg	0.56	20	07/25/11 09:00	07/29/11 20:34	7440-48-4	
Copper	**22700**	mg/kg	27.8	1000	07/25/11 09:00	07/30/11 21:02	7440-50-8	
Iron	**50700**	mg/kg	278	100	07/25/11 09:00	07/29/11 20:37	7439-89-6	
Lead	**12600**	mg/kg	5.6	1000	07/25/11 09:00	07/30/11 21:02	7439-92-1	
Manganese	**815**	mg/kg	2.8	100	07/25/11 09:00	07/29/11 20:37	7439-96-5	
Nickel	**20.7**	mg/kg	0.56	20	07/25/11 09:00	07/29/11 20:34	7440-02-0	
Zinc	**1570**	mg/kg	27.8	100	07/25/11 09:00	07/29/11 20:37	7440-66-6	
7471 Mercury	Analytical Method: EPA 7471 Preparation Method: EPA 7471							
Mercury	**4.1**	mg/kg	0.26	10	07/22/11 14:31	08/01/11 13:40	7439-97-6	M6
Dry Weight	Analytical Method: % Moisture							
Percent Moisture	**22.6**	%	0.10	1		07/25/11 00:00		

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QUALITY CONTROL DATA

Project: Black Pine Mine REV
Pace Project No.: 10163643

QC Batch: MPRP/27164 Analysis Method: EPA 6020
QC Batch Method: EPA 3050 Analysis Description: 6020 MET
Associated Lab Samples: 10163643001, 10163643002, 10163643003, 10163643004, 10163643005, 10163643006, 10163643007, 10163643008

METHOD BLANK: 1014838 Matrix: Solid
Associated Lab Samples: 10163643001, 10163643002, 10163643003, 10163643004, 10163643005, 10163643006, 10163643007, 10163643008, 10163643009, 10163643010

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Antimony	mg/kg	<0.49	0.49	07/29/11 18:56	
Arsenic	mg/kg	<0.49	0.49	07/29/11 18:56	
Barium	mg/kg	<0.29	0.29	07/29/11 18:56	
Cadmium	mg/kg	<0.078	0.078	07/29/11 18:56	
Chromium	mg/kg	<0.49	0.49	07/29/11 18:56	
Cobalt	mg/kg	<0.49	0.49	07/29/11 18:56	
Copper	mg/kg	<0.49	0.49	07/29/11 18:56	
Iron	mg/kg	<49.0	49.0	07/29/11 18:56	
Lead	mg/kg	<0.098	0.098	07/29/11 18:56	
Manganese	mg/kg	<0.49	0.49	07/29/11 18:56	
Nickel	mg/kg	<0.49	0.49	07/29/11 18:56	
Zinc	mg/kg	<4.9	4.9	07/29/11 18:56	

LABORATORY CONTROL SAMPLE: 1014839

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Antimony	mg/kg	19.4	21.2	109	75-125	
Arsenic	mg/kg	19.4	21.1	109	75-125	
Barium	mg/kg	19.4	20.1	104	75-125	
Cadmium	mg/kg	19.4	19.8	102	75-125	
Chromium	mg/kg	19.4	20.5	105	75-125	
Cobalt	mg/kg	19.4	21.2	109	75-125	
Copper	mg/kg	19.4	20.6	106	75-125	
Iron	mg/kg	243	258	106	75-125	
Lead	mg/kg	19.4	20.2	104	75-125	
Manganese	mg/kg	19.4	20.1	104	75-125	
Nickel	mg/kg	19.4	21.5	111	75-125	
Zinc	mg/kg	19.4	20.7	106	75-125	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 1014840 1014841

Parameter	Units	10163643001 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Antimony	mg/kg	529	23.7	19.3	523	420	-26	-566	75-125	22	20	D6,M6
Arsenic	mg/kg	496	23.7	19.3	469	395	-115	-522	75-125	17	20	M6
Barium	mg/kg	289	23.7	19.3	332	266	181	-122	75-125	22	20	D6,M6
Cadmium	mg/kg	7.5	23.7	19.3	31.5	22.4	101	77	75-125	33	20	D6
Chromium	mg/kg	3.7	23.7	19.3	27.8	19.4	101	81	75-125	35	20	D6

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QUALITY CONTROL DATA

Project: Black Pine Mine REV
Pace Project No.: 10163643

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 1014840 1014841

Parameter	Units	10163643001 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Cobalt	mg/kg	4.3	23.7	19.3	26.2	18.1	92	71	75-125	36	20	
Copper	mg/kg	1110	23.7	19.3	1140	860	146	-1290	75-125	28	20	D6,E, M6
Iron	mg/kg	27600	296	241	25900	21300	-570	-2590	75-125	19	20	M6
Lead	mg/kg	2650	23.7	19.3	2410	2110	-978	-2760	75-125	13	20	E,M6
Manganese	mg/kg	315	23.7	19.3	281	249	-143	-341	75-125	12	20	M6
Nickel	mg/kg	9.3	23.7	19.3	32.8	21.8	99	65	75-125	40	20	D6,M6
Zinc	mg/kg	250	23.7	19.3	314	224	268	-136	75-125	33	20	D6,M6

MATRIX SPIKE SAMPLE: 1014842

Parameter	Units	10163644001 Result	Spike Conc.	MS Result	MS % Rec	% Rec Limits	Qualifiers
Antimony	mg/kg	15.0	19.3	18.9	20	75-125	M6
Arsenic	mg/kg	8.6	19.3	34.2	133	75-125	M6
Barium	mg/kg	237	19.3	177	-308	75-125	M6
Cadmium	mg/kg	1.4	19.3	19.4	93	75-125	
Chromium	mg/kg	3.3	19.3	21.8	96	75-125	
Cobalt	mg/kg	4.7	19.3	21.5	87	75-125	
Copper	mg/kg	139	19.3	128	-56	75-125	M6
Iron	mg/kg	6800	241	12300	2300	75-125	M6
Lead	mg/kg	15.8	19.3	52.5	191	75-125	M6
Manganese	mg/kg	1170	19.3	464	-3680	75-125	M6
Nickel	mg/kg	6.1	19.3	22.8	87	75-125	
Zinc	mg/kg	93.2	19.3	132	204	75-125	M6

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QUALITY CONTROL DATA

Project: Black Pine Mine REV
Pace Project No.: 10163643

QC Batch: MERP/5650 Analysis Method: EPA 7471
QC Batch Method: EPA 7471 Analysis Description: 7471 Mercury
Associated Lab Samples: 10163643001, 10163643002, 10163643003, 10163643004, 10163643005, 10163643006, 10163643007, 10163643008, 10163643009

METHOD BLANK: 1016607 Matrix: Solid
Associated Lab Samples: 10163643001, 10163643002, 10163643003, 10163643004, 10163643005, 10163643006, 10163643007, 10163643008, 10163643009

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Mercury	mg/kg	<0.020	0.020	07/31/11 09:25	

LABORATORY CONTROL SAMPLE: 1016608

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Mercury	mg/kg	.44	0.45	103	80-120	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 1016609 1016610

Parameter	Units	10163634009 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Mercury	mg/kg	0.12	.45	.54	0.23	0.31	25	35	80-120	27	20	D6,M1

MATRIX SPIKE SAMPLE: 1016611

Parameter	Units	10163643009 Result	Spike Conc.	MS Result	MS % Rec	% Rec Limits	Qualifiers
Mercury	mg/kg	137	.6	137	14	80-120	M6

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QUALITY CONTROL DATA

Project: Black Pine Mine REV
Pace Project No.: 10163643

QC Batch: MERP/5651
QC Batch Method: EPA 7471
Analysis Method: EPA 7471
Analysis Description: 7471 Mercury
Associated Lab Samples: 10163643010

METHOD BLANK: 1016612 Matrix: Solid
Associated Lab Samples: 10163643010

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Mercury	mg/kg	<0.018	0.018	08/01/11 13:16	

LABORATORY CONTROL SAMPLE: 1016613

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Mercury	mg/kg	.45	0.46	102	80-120	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 1016614 1016615

Parameter	Units	10163643010 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Mercury	mg/kg	4.1	.62	.65	3.8	3.9	-53	-36	80-120	3	20	M6

MATRIX SPIKE SAMPLE: 1016616

Parameter	Units	10163645009 Result	Spike Conc.	MS Result	MS % Rec	% Rec Limits	Qualifiers
Mercury	mg/kg	0.30	.44	0.47	39	80-120	M1

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QUALITY CONTROL DATA

Project: Black Pine Mine REV
Pace Project No.: 10163643

QC Batch: MPRP/27293 Analysis Method: % Moisture
QC Batch Method: % Moisture Analysis Description: Dry Weight/Percent Moisture
Associated Lab Samples: 10163643001, 10163643002, 10163643003, 10163643004, 10163643005, 10163643006, 10163643007, 10163643008

SAMPLE DUPLICATE: 1019403

Parameter	Units	10163634006 Result	Dup Result	RPD	Max RPD	Qualifiers
Percent Moisture	%	10.3	11.1	7	30	

SAMPLE DUPLICATE: 1019404

Parameter	Units	10163643008 Result	Dup Result	RPD	Max RPD	Qualifiers
Percent Moisture	%	18.6	18.3	2	30	

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QUALITY CONTROL DATA

Project: Black Pine Mine REV
Pace Project No.: 10163643

QC Batch: MPRP/27306
QC Batch Method: % Moisture
Analysis Method: % Moisture
Analysis Description: Dry Weight/Percent Moisture
Associated Lab Samples: 10163643009, 10163643010

SAMPLE DUPLICATE: 1019478

Parameter	Units	10163643009 Result	Dup Result	RPD	Max RPD	Qualifiers
Percent Moisture	%	16.2	16.3	1	30	

SAMPLE DUPLICATE: 1019479

Parameter	Units	10163645008 Result	Dup Result	RPD	Max RPD	Qualifiers
Percent Moisture	%	37.2	40.7	9	30	

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QUALITY CONTROL DATA

Project: Black Pine Mine REV
Pace Project No.: 10163643

QC Batch: MT/6497 Analysis Method: Modified Sobek 3.2
QC Batch Method: Modified Sobek 3.2 Analysis Description: Sobek Acid Base Potential
Associated Lab Samples: 10163643002, 10163643005

METHOD BLANK: 1020551 Matrix: Solid
Associated Lab Samples: 10163643002, 10163643005

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Neutralization Potential	tons/1000	<0.5	0.50	08/01/11 00:00	

SAMPLE DUPLICATE: 1020552

Parameter	Units	10163634001 Result	Dup Result	RPD	Max RPD	Qualifiers
Neutralization Potential	tons/1000	0.73	2.2			

SAMPLE DUPLICATE: 1024994

Parameter	Units	10163640008 Result	Dup Result	RPD	Max RPD	Qualifiers
Neutralization Potential	tons/1000	2.4	5.6			

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QUALITY CONTROL DATA

Project: Black Pine Mine REV
Pace Project No.: 10163643

QC Batch: MT/6488 Analysis Method: Modified Sobek 3.2
QC Batch Method: Modified Sobek 3.2 Analysis Description: Sobek Extractable Sulfur
Associated Lab Samples: 10163643002, 10163643005

METHOD BLANK: 1019974 Matrix: Solid
Associated Lab Samples: 10163643002, 10163643005

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Total Sulfur	% (w/w)	<0.050	0.050	08/08/11 14:36	

SAMPLE DUPLICATE: 1019976

Parameter	Units	10163634001 Result	Dup Result	RPD	Max RPD	Qualifiers
Total Sulfur	% (w/w)	<0.050	<0.050			

SAMPLE DUPLICATE: 1019977

Parameter	Units	10163643005 Result	Dup Result	RPD	Max RPD	Qualifiers
Total Sulfur	% (w/w)	0.0605	0.0697	14		

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QUALITY CONTROL DATA

Project: Black Pine Mine REV
Pace Project No.: 10163643

QC Batch: MT/6543 Analysis Method: Modified Sobek 3.2
QC Batch Method: Modified Sobek 3.2 Analysis Description: Sobek SMP Buffer pH
Associated Lab Samples: 10163643002, 10163643005

SAMPLE DUPLICATE: 1022818

Parameter	Units	10163634001 Result	Dup Result	RPD	Max RPD	Qualifiers
SMP Buffer pH	Std. Units	7.3	7.2	.3	20	

SAMPLE DUPLICATE: 1026468

Parameter	Units	10163643005 Result	Dup Result	RPD	Max RPD	Qualifiers
SMP Buffer pH	Std. Units	7.1	7.1	.3	20	

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QUALIFIERS

Project: Black Pine Mine REV
Pace Project No.: 10163643

DEFINITIONS

DF - Dilution Factor, if reported, represents the factor applied to the reported data due to changes in sample preparation, dilution of the sample aliquot, or moisture content.

ND - Not Detected at or above adjusted reporting limit.

J - Estimated concentration above the adjusted method detection limit and below the adjusted reporting limit.

MDL - Adjusted Method Detection Limit.

S - Surrogate

1,2-Diphenylhydrazine (8270 listed analyte) decomposes to Azobenzene.

Consistent with EPA guidelines, unrounded data are displayed and have been used to calculate % recovery and RPD values.

LCS(D) - Laboratory Control Sample (Duplicate)

MS(D) - Matrix Spike (Duplicate)

DUP - Sample Duplicate

RPD - Relative Percent Difference

NC - Not Calculable.

SG - Silica Gel - Clean-Up

U - Indicates the compound was analyzed for, but not detected.

N-Nitrosodiphenylamine decomposes and cannot be separated from Diphenylamine using Method 8270. The result reported for each analyte is a combined concentration.

LABORATORIES

PASI-M	Pace Analytical Services - Minneapolis
PASI-MT	Pace Analytical Services - Montana

ANALYTE QUALIFIERS

D6	The relative percent difference (RPD) between the sample and sample duplicate exceeded laboratory control limits.
E	Analyte concentration exceeded the calibration range. The reported result is estimated.
M1	Matrix spike recovery exceeded QC limits. Batch accepted based on laboratory control sample (LCS) recovery.
M6	Matrix spike and Matrix spike duplicate recovery not evaluated against control limits due to sample dilution.

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QUALITY CONTROL DATA CROSS REFERENCE TABLE

Project: Black Pine Mine REV
Pace Project No.: 10163643

Lab ID	Sample ID	QC Batch Method	QC Batch	Analytical Method	Analytical Batch
10163643001	**BP-CML-TS-07-00**	EPA 3050	MPRP/27164	EPA 6020	ICPM/11124
10163643002	**BP-CML-TS-07-02**	EPA 3050	MPRP/27164	EPA 6020	ICPM/11124
10163643003	**BP-CML-SS-07-05**	EPA 3050	MPRP/27164	EPA 6020	ICPM/11124
10163643004	**BP-CML-TS-08-00**	EPA 3050	MPRP/27164	EPA 6020	ICPM/11124
10163643005	**BP-CML-TS-08-05**	EPA 3050	MPRP/27164	EPA 6020	ICPM/11124
10163643006	**BP-CML-SS-08-07**	EPA 3050	MPRP/27164	EPA 6020	ICPM/11124
10163643007	**BP-CML-TS-09-00**	EPA 3050	MPRP/27164	EPA 6020	ICPM/11124
10163643008	**BP-CML-TS-09-02**	EPA 3050	MPRP/27164	EPA 6020	ICPM/11124
10163643009	**BP-CML-TS-09-04**	EPA 3050	MPRP/27164	EPA 6020	ICPM/11124
10163643010	**BP-CML-TS-09-06**	EPA 3050	MPRP/27164	EPA 6020	ICPM/11124
10163643001	**BP-CML-TS-07-00**	EPA 7471	MERP/5650	EPA 7471	MERC/6493
10163643002	**BP-CML-TS-07-02**	EPA 7471	MERP/5650	EPA 7471	MERC/6493
10163643003	**BP-CML-SS-07-05**	EPA 7471	MERP/5650	EPA 7471	MERC/6493
10163643004	**BP-CML-TS-08-00**	EPA 7471	MERP/5650	EPA 7471	MERC/6493
10163643005	**BP-CML-TS-08-05**	EPA 7471	MERP/5650	EPA 7471	MERC/6493
10163643006	**BP-CML-SS-08-07**	EPA 7471	MERP/5650	EPA 7471	MERC/6493
10163643007	**BP-CML-TS-09-00**	EPA 7471	MERP/5650	EPA 7471	MERC/6493
10163643008	**BP-CML-TS-09-02**	EPA 7471	MERP/5650	EPA 7471	MERC/6493
10163643009	**BP-CML-TS-09-04**	EPA 7471	MERP/5650	EPA 7471	MERC/6493
10163643010	**BP-CML-TS-09-06**	EPA 7471	MERP/5651	EPA 7471	MERC/6471
10163643001	**BP-CML-TS-07-00**	% Moisture	MPRP/27293		
10163643002	**BP-CML-TS-07-02**	% Moisture	MPRP/27293		
10163643003	**BP-CML-SS-07-05**	% Moisture	MPRP/27293		
10163643004	**BP-CML-TS-08-00**	% Moisture	MPRP/27293		
10163643005	**BP-CML-TS-08-05**	% Moisture	MPRP/27293		
10163643006	**BP-CML-SS-08-07**	% Moisture	MPRP/27293		
10163643007	**BP-CML-TS-09-00**	% Moisture	MPRP/27293		
10163643008	**BP-CML-TS-09-02**	% Moisture	MPRP/27293		
10163643009	**BP-CML-TS-09-04**	% Moisture	MPRP/27306		
10163643010	**BP-CML-TS-09-06**	% Moisture	MPRP/27306		
10163643002	**BP-CML-TS-07-02**	Modified Sobek 3.2	MT/6497		
10163643005	**BP-CML-TS-08-05**	Modified Sobek 3.2	MT/6497		
10163643002	**BP-CML-TS-07-02**	Modified Sobek 3.2	MT/6488		
10163643005	**BP-CML-TS-08-05**	Modified Sobek 3.2	MT/6488		
10163643002	**BP-CML-TS-07-02**	Modified Sobek 3.2	MT/6501		
10163643005	**BP-CML-TS-08-05**	Modified Sobek 3.2	MT/6501		
10163643002	**BP-CML-TS-07-02**	Modified Sobek 3.2	MT/6543		
10163643005	**BP-CML-TS-08-05**	Modified Sobek 3.2	MT/6543		

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CHAIN-OF-CUSTODY / Analytical Request Document

The Chain-of-Custody is a LEGAL DOCUMENT. All relevant fields must be completed accurately.

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1429995

Section A Required Client Information:

Company: Herrera
Address:
Email To:
Phone: Fax:
Requested Due Date/TAT:

Section B Required Project Information:

Report To: Kevin Houck
Copy To:
Purchase Order No.:
Project Name:
Project Number:

Section C Invoice Information:

Attention:
Company Name: DEQ
Address:
Pace Quote Reference:
Pace Project Manager:
Pace Profile #:

REGULATORY AGENCY

☐ NPDES ☐ GROUND WATER ☐ DRINKING WATER
☐ UST ☐ RCRA ☐ OTHER

Site Location STATE:

Section D Required Client Information

SAMPLE ID
(A-Z, 0-9 / ,-)
Sample IDs MUST BE UNIQUE

Matrix Codes MATRIX / CODE

Drinking Water	DW
Water	WT
Waste Water	WW
Product	P
Soil/Solid	SL
Oil	OL
Wipe	WP
Air	AR
Tissue	TS
Other	OT

ITEM #	SAMPLE ID	MATRIX CODE (see valid codes to left)	SAMPLE TYPE (G=GRAB C=COMP)	COLLECTED COMPOSITE START DATE	COMPOSITE START TIME	COMPOSITE END/GRAB DATE	COMPOSITE END/GRAB TIME	SAMPLE TEMP AT COLLECTION	# OF CONTAINERS	Preservatives: Unpreserved	H_2SO_4	HNO_3	HCl	NaOH	$Na_2S_2O_3$	Methanol	Other	Analysis Test Y/N	Tot. Rec Met	ABA	Moisture content	Residual Chlorine (Y/N)	Pace Project No./ Lab I.D.
1	BP-CML-TS-07-00	SL	G			7/15/11	1232		1	X									X				001
2	BP-CML-TS-07-02	↓	↓			↓	1235		2	X									X	X	X		002
3	BP-CML-SS-07-05						1237		1	X									X				003
4	BP-CML-TS-08-00	SL	G			7/15/11	1255		1	X									X		X		004
5	BP-CML-TS-08-05	↓	↓			↓	1258		2	X									X	X	X		005
6	BP-CML-SS-08-07						1300		1	X									X				006
7	BP-CML-TS-09-00	SL	G			7/15/11	1335		1	X									X				007
8	BP-CML-TS-09-02	↓	↓			↓	1337		1	X									X				008
9	BP-CML-TS-09-04						1339		1	X									X				009
10	BP-CML-TS-09-06	↓	↓			↓	1340		1	X									X				010
11																							
12																							

Requested Analysis Filtered (Y/N)

10163643

ADDITIONAL COMMENTS	RELINQUISHED BY / AFFILIATION	DATE	TIME	ACCEPTED BY / AFFILIATION	DATE	TIME	SAMPLE CONDITIONS: Temp in °C	Received on Ice (Y/N)	Custody Sealed Cooler (Y/N)	Samples Intact (Y/N)
	DD Cox / Herrera	7/15/11	1630	BL Noz / Pace	7/16/11	1136	4.4	Y	Y	X

ORIGINAL

SAMPLER NAME AND SIGNATURE
PRINT Name of SAMPLER:
SIGNATURE of SAMPLER: DATE Signed (MM/DD/YY):

*Important Note: By signing this form you are accepting Pace's NET 30 day payment terms and agreeing to late charges of 1.5% per month for any invoices not paid within 30 days.

F-ALL-Q-020rev.07, 15-May-2007

Sample Condition Upon Receipt

Pace Analytical

Client Name: MDEQ - BLACK PINE Project # 10163643

Courier: [X] Fed Ex [ ] UPS [ ] USPS [ ] Client [ ] Commercial [ ] Pace Other _____

Tracking #: 876249308789

Custody Seal on Cooler/Box Present: [X] yes [ ] no Seals intact: [X] yes [ ] no

Packing Material: [ ] Bubble Wrap [X] Bubble Bags [ ] None [ ] Other _____ Temp Blank: Yes X No _____

Thermometer Used 383045 or 135 Type of Ice: (Wet) Blue None [X] Samples on ice, cooling process has begun

Cooler Temperature 4.4° Biological Tissue is Frozen: Yes No

Temp should be above freezing to 6°C

Date and Initials of person examining contents: NCC 7/17/11

Comments:

Chain of Custody Present:	[X] Yes [ ] No [ ] N/A	1.
Chain of Custody Filled Out:	[X] Yes [ ] No [ ] N/A	2.
Chain of Custody Relinquished:	[X] Yes [ ] No [ ] N/A	3.
Sampler Name & Signature on COC:	[X] Yes [ ] No [ ] N/A	4.
Samples Arrived within Hold Time:	[X] Yes [ ] No [ ] N/A	5.
Short Hold Time Analysis (<72hr):	[ ] Yes [X] No [ ] N/A	6.
Rush Turn Around Time Requested:	[ ] Yes [X] No [ ] N/A	7.
Sufficient Volume:	[X] Yes [ ] No [ ] N/A	8.
Correct Containers Used:	[X] Yes [ ] No [ ] N/A	9.
-Pace Containers Used:	[X] Yes [ ] No [ ] N/A	
Containers Intact:	[X] Yes [ ] No [ ] N/A	10.
Filtered volume received for Dissolved tests	[ ] Yes [ ] No [X] N/A	11.
Sample Labels match COC:	[X] Yes [ ] No [ ] N/A	12.
-Includes date/time/ID/Analysis Matrix: SOIL		
All containers needing acid/base preservation have been checked. Noncompliance are noted in 13.	[ ] Yes [ ] No [X] N/A	13. [ ] HNO3 [ ] H2SO4 [ ] NaOH [ ] HCl
All containers needing preservation are found to be in compliance with EPA recommendation.	[ ] Yes [ ] No [X] N/A	Samp #
Exceptions: VOA,Coliform, TOC, Oil and Grease, WI-DRO (water)	[ ] Yes [X] No	Initial when completed / Lot # of added preservative
Samples checked for dechlorination:	[ ] Yes [ ] No [X] N/A	14.
Headspace in VOA Vials (>6mm):	[ ] Yes [ ] No [X] N/A	15.
Trip Blank Present:	[ ] Yes [ ] No [X] N/A	16.
Trip Blank Custody Seals Present	[ ] Yes [ ] No [X] N/A	
Pace Trip Blank Lot # (if purchased):		

Client Notification/ Resolution: Field Data Required? Y / N

Person Contacted: _____ Date/Time: _____

Comments/ Resolution: _____

Project Manager Review: _____ **Date:** 7/17/11

Note: Whenever there is a discrepancy affecting North Carolina compliance samples, a copy of this form will be sent to the North Carolina DEHNR Certification Office (i.e out of hold, incorrect preservative, out of temp, incorrect containers)

Pace Analytical Services, Inc.
602 S 25th Street
Billings, MT 591014549
(406)254-7226

October 18, 2011

Kevin Houck
Herrera Environmental Consultants
101 East Broadway, Suite 610
Missoula, MT 59802

RE: Project: Black Pine Mine REV
Pace Project No.: 10163644

Dear Kevin Houck:
Enclosed are the analytical results for sample(s) received by the laboratory on July 16, 2011. The results relate only to the samples included in this report.

This report has been revised to add Cobalt and delete Silver.

If you have any questions concerning this report, please feel free to contact me.

Sincerely,

Shawn Davis for
Sally Heinje
sally.heinje@pacelabs.com
Project Manager

Enclosures

cc: Devin Clary, Montana Dept. of Environmental Quality
Mark Donner, Trihydro
Jamie Mongoven, Montana Dept. of Environmental

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CERTIFICATIONS

Project: Black Pine Mine REV
Pace Project No.: 10163644

Minnesota Certification IDs

1700 Elm Street SE Suite 200, Minneapolis, MN 55414
A2LA Certification #: 2926.01
Alaska Certification #: UST-078
Alaska Certification #MN00064
Arizona Certification #: AZ-0014
Arkansas Certification #: 88-0680
California Certification #: 01155CA
EPA Region 8 Certification #: Pace
Florida/NELAP Certification #: E87605
Georgia Certification #: 959
Idaho Certification #: MN00064
Illinois Certification #: 200011
Iowa Certification #: 368
Kansas Certification #: E-10167
Louisiana Certification #: 03086
Louisiana Certification #: LA080009
Maine Certification #: 2007029
Maryland Certification #: 322
Michigan DEQ Certification #: 9909
Minnesota Certification #: 027-053-137
Mississippi Certification #: Pace
Montana Certification #: MT CERT0092
Nebraska Certification #: Pace
Nevada Certification #: MN_00064
New Jersey Certification #: MN-002
New Mexico Certification #: Pace
New York Certification #: 11647
North Carolina Certification #: 530
North Dakota Certification #: R-036
North Dakota Certification #: R-036A
Ohio VAP Certification #: CL101
Oklahoma Certification #: D9921
Oklahoma Certification #: 9507
Oregon Certification #: MN200001
Pennsylvania Certification #: 68-00563
Puerto Rico Certification
Tennessee Certification #: 02818
Texas Certification #: T104704192
Washington Certification #: C754
Wisconsin Certification #: 999407970

Montana Certification IDs

602 South 25th Street, Billings, MT 59101
EPA Region 8 Certification #: 8TMS-Q
Idaho Certification #: MT00012
Montana Certification #: MT CERT0040
NVLAP Certification #: 101292-0
Minnesota Dept of Health Certification #: 030-999-442

Kansas Certification IDs

9608 Loiret Boulevard, Lenexa, KS 66219
A2LA Certification #: 2456.01
Arkansas Certification #: 05-008-0
Illinois Certification #: 001191
Iowa Certification #: 118
Kansas/NELAP Certification #: E-10116
Louisiana Certification #: 03055
Nevada Certification #: KS000212008A
Oklahoma Certification #: 9205/9935
Texas Certification #: T104704407-08-TX
Utah Certification #: 9135995665

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SAMPLE SUMMARY

Project: Black Pine Mine REV
Pace Project No.: 10163644

Lab ID	Sample ID	Matrix	Date Collected	Date Received
10163644001	**BP-CMN-SS-10-00**	Solid	07/14/11 14:55	07/16/11 11:30
10163644002	**BP-CMN-SS-10-04**	Solid	07/14/11 15:00	07/16/11 11:30
10163644003	**BP-CMN-SS-14-00**	Solid	07/14/11 15:15	07/16/11 11:30
10163644004	**BP-CMN-SS-14-04**	Solid	07/14/11 15:20	07/16/11 11:30
10163644005	**BP-CMN-SS-13-00**	Solid	07/14/11 15:50	07/16/11 11:30
10163644006	**BP-CMN-SS-13-04**	Solid	07/14/11 15:55	07/16/11 11:30
10163644007	**BP-CMN-SS-12-00**	Solid	07/14/11 16:15	07/16/11 11:30
10163644008	**BP-CMN-SS-12-04**	Solid	07/14/11 16:20	07/16/11 11:30
10163644009	**BP-CMN-SS-11-00**	Solid	07/14/11 16:40	07/16/11 11:30
10163644010	**BP-CMN-SS-11-04**	Solid	07/14/11 16:45	07/16/11 11:30

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SAMPLE ANALYTE COUNT

Project: Black Pine Mine REV
Pace Project No.: 10163644

Lab ID	Sample ID	Method	Analysts	Analytes Reported	Laboratory
10163644001	**BP-CMN-SS-10-00**	EPA 6020	TL1	12	PASI-M
		EPA 7471	TEM	1	PASI-M
		% Moisture	JDL	1	PASI-M
		Modified Sobek 3.2	JH1	1	PASI-MT
		Modified Sobek 3.2	JH1	5	PASI-MT
		Modified Sobek 3.2	JH1	4	PASI-MT
		Modified Sobek 3.2	JH1	1	PASI-MT
10163644002	**BP-CMN-SS-10-04**	EPA 6020	TL1	12	PASI-M
		EPA 7471	TEM	1	PASI-M
		% Moisture	JDL	1	PASI-M
10163644003	**BP-CMN-SS-14-00**	EPA 6020	TL1	12	PASI-M
		EPA 7471	TEM	1	PASI-M
		% Moisture	JDL	1	PASI-M
		Modified Sobek 3.2	JH1	1	PASI-MT
		Modified Sobek 3.2	JH1	5	PASI-MT
		Modified Sobek 3.2	JH1	4	PASI-MT
		Modified Sobek 3.2	KB2	1	PASI-MT
10163644004	**BP-CMN-SS-14-04**	EPA 6020	TL1	12	PASI-M
		EPA 7471	TEM	1	PASI-M
		% Moisture	JDL	1	PASI-M
10163644005	**BP-CMN-SS-13-00**	EPA 6020	TL1	12	PASI-M
		EPA 7471	TEM	1	PASI-M
		% Moisture	JDL	1	PASI-M
		Modified Sobek 3.2	JH1	1	PASI-MT
		Modified Sobek 3.2	JH1	5	PASI-MT
		Modified Sobek 3.2	JH1	4	PASI-MT
		Modified Sobek 3.2	JH1	1	PASI-MT
10163644006	**BP-CMN-SS-13-04**	CLPICPAES	IP	1	PASI-M
		EPA 9081	SMW	1	PASI-K
		EPA 6020	TL1	12	PASI-M
		EPA 7471	TEM	1	PASI-M
		% Moisture	JDL	1	PASI-M
		ASA 33-3.2/EPA 353.2	CAC	1	PASI-MT
		ASTM D421	CAC	1	PASI-MT
		ASA 29-3.5.2	CAC	1	PASI-MT
		ASA 10-3.2	CAC	1	PASI-MT
		ASA 24-5.4/SM4500	SA1	1	PASI-MT

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SAMPLE ANALYTE COUNT

Project: Black Pine Mine REV
Pace Project No.: 10163644

Lab ID	Sample ID	Method	Analysts	Analytes Reported	Laboratory
		Modified Sobek 3.2	JH1	1	PASI-MT
		Modified Sobek 3.2	JH1	5	PASI-MT
		Modified Sobek 3.2	JH1	4	PASI-MT
		Modified Sobek 3.2	JH1	1	PASI-MT
		ASA 10-3.3	SR1	1	PASI-MT
10163644007	**BP-CMN-SS-12-00**	EPA 6020	TL1	12	PASI-M
		EPA 7471	TEM	1	PASI-M
		% Moisture	JDL	1	PASI-M
		Modified Sobek 3.2	JH1	1	PASI-MT
		Modified Sobek 3.2	JH1	5	PASI-MT
		Modified Sobek 3.2	JH1	4	PASI-MT
		Modified Sobek 3.2	JH1	1	PASI-MT
10163644008	**BP-CMN-SS-12-04**	CLPICPAES	IP	1	PASI-M
		EPA 9081	SMW	1	PASI-K
		EPA 6020	TL1	12	PASI-M
		EPA 7471	TEM	1	PASI-M
		% Moisture	JDL	1	PASI-M
		ASA 33-3.2/EPA 353.2	CAC	1	PASI-MT
		ASTM D421	CAC	1	PASI-MT
		ASA 29-3.5.2	CAC	1	PASI-MT
		ASA 10-3.2	CAC	1	PASI-MT
		ASA 24-5.4/SM4500	SA1	1	PASI-MT
		Modified Sobek 3.2	JH1	1	PASI-MT
		Modified Sobek 3.2	JH1	5	PASI-MT
		Modified Sobek 3.2	JH1	4	PASI-MT
		Modified Sobek 3.2	JH1	1	PASI-MT
		ASA 10-3.3	SR1	1	PASI-MT
10163644009	**BP-CMN-SS-11-00**	EPA 6020	TL1	12	PASI-M
		EPA 7471	TEM	1	PASI-M
		% Moisture	JDL	1	PASI-M
		Modified Sobek 3.2	JH1	1	PASI-MT
		Modified Sobek 3.2	JH1	5	PASI-MT
		Modified Sobek 3.2	JH1	4	PASI-MT
		Modified Sobek 3.2	JH1	1	PASI-MT
10163644010	**BP-CMN-SS-11-04**	CLPICPAES	IP	1	PASI-M
		EPA 9081	SMW	1	PASI-K
		EPA 6020	TL1	12	PASI-M

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SAMPLE ANALYTE COUNT

Project: Black Pine Mine REV
Pace Project No.: 10163644

Lab ID	Sample ID	Method	Analysts	Analytes Reported	Laboratory
		EPA 7471	TEM	1	PASI-M
		% Moisture	JDL	1	PASI-M
		ASA 33-3.2/EPA 353.2	CAC	1	PASI-MT
		ASTM D421	CAC	1	PASI-MT
		ASA 29-3.5.2	CAC	1	PASI-MT
		ASA 10-3.2	CAC	1	PASI-MT
		ASA 24-5.4/SM4500	SA1	1	PASI-MT
		Modified Sobek 3.2	JH1	1	PASI-MT
		Modified Sobek 3.2	JH1	5	PASI-MT
		Modified Sobek 3.2	JH1	4	PASI-MT
		Modified Sobek 3.2	JH1	1	PASI-MT
		ASA 10-3.3	SR1	1	PASI-MT

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PROJECT NARRATIVE

Project: Black Pine Mine REV
Pace Project No.: 10163644

Method: **CLPICPAES**
Description: 6010 MET ICP, MDEQ Potassium
Client: Montana Dept. of Environmental Quality
Date: October 18, 2011

General Information:
3 samples were analyzed for CLPICPAES. All samples were received in acceptable condition with any exceptions noted below.

Hold Time:
The samples were analyzed within the method required hold times with any exceptions noted below.

Sample Preparation:
The samples were prepared in accordance with ASA 13-3.5.2.2 with any exceptions noted below.

Initial Calibrations (including MS Tune as applicable):
All criteria were within method requirements with any exceptions noted below.

Continuing Calibration:
All criteria were within method requirements with any exceptions noted below.

Method Blank:
All analytes were below the report limit in the method blank with any exceptions noted below.

Laboratory Control Spike:
All laboratory control spike compounds were within QC limits with any exceptions noted below.

Matrix Spikes:
All percent recoveries and relative percent differences (RPDs) were within acceptance criteria with any exceptions noted below.

Duplicate Sample:
All duplicate sample results were within method acceptance criteria with any exceptions noted below.

Additional Comments:

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PROJECT NARRATIVE

Project: Black Pine Mine REV
Pace Project No.: 10163644

Method: **EPA 9081**
Description: Cation Exchange Capacity
Client: Montana Dept. of Environmental Quality
Date: October 18, 2011

General Information:
3 samples were analyzed for EPA 9081. All samples were received in acceptable condition with any exceptions noted below.

Hold Time:
The samples were analyzed within the method required hold times with any exceptions noted below.

Initial Calibrations (including MS Tune as applicable):
All criteria were within method requirements with any exceptions noted below.

Continuing Calibration:
All criteria were within method requirements with any exceptions noted below.

Method Blank:
All analytes were below the report limit in the method blank with any exceptions noted below.

Laboratory Control Spike:
All laboratory control spike compounds were within QC limits with any exceptions noted below.

Matrix Spikes:
All percent recoveries and relative percent differences (RPDs) were within acceptance criteria with any exceptions noted below.

Duplicate Sample:
All duplicate sample results were within method acceptance criteria with any exceptions noted below.

Additional Comments:

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PROJECT NARRATIVE

Project: Black Pine Mine REV
Pace Project No.: 10163644

Method: **EPA 6020**
Description: 6020 MET ICPMS
Client: Montana Dept. of Environmental Quality
Date: October 18, 2011

General Information:
10 samples were analyzed for EPA 6020. All samples were received in acceptable condition with any exceptions noted below.

Hold Time:
The samples were analyzed within the method required hold times with any exceptions noted below.

Sample Preparation:
The samples were prepared in accordance with EPA 3050 with any exceptions noted below.

Initial Calibrations (including MS Tune as applicable):
All criteria were within method requirements with any exceptions noted below.

Continuing Calibration:
All criteria were within method requirements with any exceptions noted below.

Internal Standards:
All internal standards were within QC limits with any exceptions noted below.

Method Blank:
All analytes were below the report limit in the method blank with any exceptions noted below.

Laboratory Control Spike:
All laboratory control spike compounds were within QC limits with any exceptions noted below.

Matrix Spikes:
All percent recoveries and relative percent differences (RPDs) were within acceptance criteria with any exceptions noted below.

QC Batch: MPRP/27164

A matrix spike and matrix spike duplicate (MS/MSD) were performed on the following sample(s): 10163643001,10163644001

M6: Matrix spike and Matrix spike duplicate recovery not evaluated against control limits due to sample dilution.

- MS (Lab ID: 1014840)
  - Antimony
  - Arsenic
  - Barium
  - Copper
  - Iron
  - Lead
  - Manganese
  - Zinc
- MS (Lab ID: 1014842)
  - Antimony
  - Arsenic
  - Barium
  - Copper

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PROJECT NARRATIVE

Project: Black Pine Mine REV
Pace Project No.: 10163644

Method: **EPA 6020**
Description: 6020 MET ICPMS
Client: Montana Dept. of Environmental Quality
Date: October 18, 2011

QC Batch: MPRP/27164

A matrix spike and matrix spike duplicate (MS/MSD) were performed on the following sample(s): 10163643001,10163644001

M6: Matrix spike and Matrix spike duplicate recovery not evaluated against control limits due to sample dilution.

- Iron
- Lead
- Manganese
- Zinc

- MSD (Lab ID: 1014841)
  - Antimony
  - Arsenic
  - Barium
  - Copper
  - Iron
  - Lead
  - Manganese
  - Nickel
  - Zinc

Duplicate Sample:
All duplicate sample results were within method acceptance criteria with any exceptions noted below.

Additional Comments:

Analyte Comments:

QC Batch: MPRP/27164

E: Analyte concentration exceeded the calibration range. The reported result is estimated.

- MS (Lab ID: 1014840)
  - Copper
  - Lead
- MSD (Lab ID: 1014841)
  - Lead

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PROJECT NARRATIVE

Project: Black Pine Mine REV
Pace Project No.: 10163644

Method: **EPA 7471**
Description: 7471 Mercury
Client: Montana Dept. of Environmental Quality
Date: October 18, 2011

General Information:
10 samples were analyzed for EPA 7471. All samples were received in acceptable condition with any exceptions noted below.

Hold Time:
The samples were analyzed within the method required hold times with any exceptions noted below.

Sample Preparation:
The samples were prepared in accordance with EPA 7471 with any exceptions noted below.

Initial Calibrations (including MS Tune as applicable):
All criteria were within method requirements with any exceptions noted below.

Continuing Calibration:
All criteria were within method requirements with any exceptions noted below.

Method Blank:
All analytes were below the report limit in the method blank with any exceptions noted below.

Laboratory Control Spike:
All laboratory control spike compounds were within QC limits with any exceptions noted below.

Matrix Spikes:
All percent recoveries and relative percent differences (RPDs) were within acceptance criteria with any exceptions noted below.

QC Batch: MERP/5651

A matrix spike and matrix spike duplicate (MS/MSD) were performed on the following sample(s): 10163643010,10163645009

M1: Matrix spike recovery exceeded QC limits. Batch accepted based on laboratory control sample (LCS) recovery.

- MS (Lab ID: 1016616)
  - Mercury

M6: Matrix spike and Matrix spike duplicate recovery not evaluated against control limits due to sample dilution.

- MS (Lab ID: 1016614)
  - Mercury
- MSD (Lab ID: 1016615)
  - Mercury

Duplicate Sample:
All duplicate sample results were within method acceptance criteria with any exceptions noted below.

Additional Comments:

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PROJECT NARRATIVE

Project: Black Pine Mine REV
Pace Project No.: 10163644

Method: **ASA 33-3.2/EPA 353.2**
Description: 353.2 Nitrate + Nitrite pres.
Client: Montana Dept. of Environmental Quality
Date: October 18, 2011

General Information:
3 samples were analyzed for ASA 33-3.2/EPA 353.2. All samples were received in acceptable condition with any exceptions noted below.

Hold Time:
The samples were analyzed within the method required hold times with any exceptions noted below.

Initial Calibrations (including MS Tune as applicable):
All criteria were within method requirements with any exceptions noted below.

Continuing Calibration:
All criteria were within method requirements with any exceptions noted below.

Internal Standards:
All internal standards were within QC limits with any exceptions noted below.

Surrogates:
All surrogates were within QC limits with any exceptions noted below.

Method Blank:
All analytes were below the report limit in the method blank with any exceptions noted below.

Laboratory Control Spike:
All laboratory control spike compounds were within QC limits with any exceptions noted below.

Matrix Spikes:
All percent recoveries and relative percent differences (RPDs) were within acceptance criteria with any exceptions noted below.

Duplicate Sample:
All duplicate sample results were within method acceptance criteria with any exceptions noted below.

Additional Comments:

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PROJECT NARRATIVE

Project: Black Pine Mine REV
Pace Project No.: 10163644

Method: **ASTM D421**
Description: Coarse
Client: Montana Dept. of Environmental Quality
Date: October 18, 2011

General Information:
3 samples were analyzed for ASTM D421. All samples were received in acceptable condition with any exceptions noted below.

Hold Time:
The samples were analyzed within the method required hold times with any exceptions noted below.

Initial Calibrations (including MS Tune as applicable):
All criteria were within method requirements with any exceptions noted below.

Continuing Calibration:
All criteria were within method requirements with any exceptions noted below.

Internal Standards:
All internal standards were within QC limits with any exceptions noted below.

Surrogates:
All surrogates were within QC limits with any exceptions noted below.

Method Blank:
All analytes were below the report limit in the method blank with any exceptions noted below.

Laboratory Control Spike:
All laboratory control spike compounds were within QC limits with any exceptions noted below.

Matrix Spikes:
All percent recoveries and relative percent differences (RPDs) were within acceptance criteria with any exceptions noted below.

Duplicate Sample:
All duplicate sample results were within method acceptance criteria with any exceptions noted below.

Additional Comments:

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PROJECT NARRATIVE

Project: Black Pine Mine REV
Pace Project No.: 10163644

Method: **ASA 29-3.5.2**
Description: Organic Matter MT ASA 29
Client: Montana Dept. of Environmental Quality
Date: October 18, 2011

General Information:
3 samples were analyzed for ASA 29-3.5.2. All samples were received in acceptable condition with any exceptions noted below.

Hold Time:
The samples were analyzed within the method required hold times with any exceptions noted below.

Initial Calibrations (including MS Tune as applicable):
All criteria were within method requirements with any exceptions noted below.

Continuing Calibration:
All criteria were within method requirements with any exceptions noted below.

Internal Standards:
All internal standards were within QC limits with any exceptions noted below.

Surrogates:
All surrogates were within QC limits with any exceptions noted below.

Method Blank:
All analytes were below the report limit in the method blank with any exceptions noted below.

Laboratory Control Spike:
All laboratory control spike compounds were within QC limits with any exceptions noted below.

Matrix Spikes:
All percent recoveries and relative percent differences (RPDs) were within acceptance criteria with any exceptions noted below.

Duplicate Sample:
All duplicate sample results were within method acceptance criteria with any exceptions noted below.

Additional Comments:

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PROJECT NARRATIVE

Project: Black Pine Mine REV
Pace Project No.: 10163644

Method: **ASA 10-3.2**
Description: ASA 10-3.2 pH
Client: Montana Dept. of Environmental Quality
Date: October 18, 2011

General Information:
3 samples were analyzed for ASA 10-3.2. All samples were received in acceptable condition with any exceptions noted below.

Hold Time:
The samples were analyzed within the method required hold times with any exceptions noted below.

Initial Calibrations (including MS Tune as applicable):
All criteria were within method requirements with any exceptions noted below.

Continuing Calibration:
All criteria were within method requirements with any exceptions noted below.

Internal Standards:
All internal standards were within QC limits with any exceptions noted below.

Surrogates:
All surrogates were within QC limits with any exceptions noted below.

Method Blank:
All analytes were below the report limit in the method blank with any exceptions noted below.

Laboratory Control Spike:
All laboratory control spike compounds were within QC limits with any exceptions noted below.

Matrix Spikes:
All percent recoveries and relative percent differences (RPDs) were within acceptance criteria with any exceptions noted below.

Duplicate Sample:
All duplicate sample results were within method acceptance criteria with any exceptions noted below.

Additional Comments:

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PROJECT NARRATIVE

Project: Black Pine Mine REV
Pace Project No.: 10163644

Method: **ASA 24-5.4/SM4500**
Description: SM4500P-E, Total Phosphorus
Client: Montana Dept. of Environmental Quality
Date: October 18, 2011

General Information:
3 samples were analyzed for ASA 24-5.4/SM4500. All samples were received in acceptable condition with any exceptions noted below.

Hold Time:
The samples were analyzed within the method required hold times with any exceptions noted below.

Initial Calibrations (including MS Tune as applicable):
All criteria were within method requirements with any exceptions noted below.

Continuing Calibration:
All criteria were within method requirements with any exceptions noted below.

Internal Standards:
All internal standards were within QC limits with any exceptions noted below.

Surrogates:
All surrogates were within QC limits with any exceptions noted below.

Method Blank:
All analytes were below the report limit in the method blank with any exceptions noted below.

Laboratory Control Spike:
All laboratory control spike compounds were within QC limits with any exceptions noted below.

Matrix Spikes:
All percent recoveries and relative percent differences (RPDs) were within acceptance criteria with any exceptions noted below.

Duplicate Sample:
All duplicate sample results were within method acceptance criteria with any exceptions noted below.

Additional Comments:

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PROJECT NARRATIVE

Project: Black Pine Mine REV
Pace Project No.: 10163644

Method: **Modified Sobek 3.2**
Description: Sobek Acid Base Potential
Client: Montana Dept. of Environmental Quality
Date: October 18, 2011

General Information:
8 samples were analyzed for Modified Sobek 3.2. All samples were received in acceptable condition with any exceptions noted below.

Hold Time:
The samples were analyzed within the method required hold times with any exceptions noted below.

Initial Calibrations (including MS Tune as applicable):
All criteria were within method requirements with any exceptions noted below.

Continuing Calibration:
All criteria were within method requirements with any exceptions noted below.

Internal Standards:
All internal standards were within QC limits with any exceptions noted below.

Surrogates:
All surrogates were within QC limits with any exceptions noted below.

Method Blank:
All analytes were below the report limit in the method blank with any exceptions noted below.

Laboratory Control Spike:
All laboratory control spike compounds were within QC limits with any exceptions noted below.

Matrix Spikes:
All percent recoveries and relative percent differences (RPDs) were within acceptance criteria with any exceptions noted below.

Duplicate Sample:
All duplicate sample results were within method acceptance criteria with any exceptions noted below.

Additional Comments:

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PROJECT NARRATIVE

Project: Black Pine Mine REV
Pace Project No.: 10163644

Method: **Modified Sobek 3.2**
Description: Sobek Extractable Sulfur
Client: Montana Dept. of Environmental Quality
Date: October 18, 2011

General Information:
8 samples were analyzed for Modified Sobek 3.2. All samples were received in acceptable condition with any exceptions noted below.

Hold Time:
The samples were analyzed within the method required hold times with any exceptions noted below.

Initial Calibrations (including MS Tune as applicable):
All criteria were within method requirements with any exceptions noted below.

Continuing Calibration:
All criteria were within method requirements with any exceptions noted below.

Internal Standards:
All internal standards were within QC limits with any exceptions noted below.

Surrogates:
All surrogates were within QC limits with any exceptions noted below.

Method Blank:
All analytes were below the report limit in the method blank with any exceptions noted below.

Laboratory Control Spike:
All laboratory control spike compounds were within QC limits with any exceptions noted below.

Matrix Spikes:
All percent recoveries and relative percent differences (RPDs) were within acceptance criteria with any exceptions noted below.

Duplicate Sample:
All duplicate sample results were within method acceptance criteria with any exceptions noted below.

Additional Comments:

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PROJECT NARRATIVE

Project: Black Pine Mine REV
Pace Project No.: 10163644

Method: **Modified Sobek 3.2**
Description: Sobek Calculations
Client: Montana Dept. of Environmental Quality
Date: October 18, 2011

General Information:
8 samples were analyzed for Modified Sobek 3.2. All samples were received in acceptable condition with any exceptions noted below.

Hold Time:
The samples were analyzed within the method required hold times with any exceptions noted below.

Initial Calibrations (including MS Tune as applicable):
All criteria were within method requirements with any exceptions noted below.

Continuing Calibration:
All criteria were within method requirements with any exceptions noted below.

Internal Standards:
All internal standards were within QC limits with any exceptions noted below.

Surrogates:
All surrogates were within QC limits with any exceptions noted below.

Method Blank:
All analytes were below the report limit in the method blank with any exceptions noted below.

Laboratory Control Spike:
All laboratory control spike compounds were within QC limits with any exceptions noted below.

Matrix Spikes:
All percent recoveries and relative percent differences (RPDs) were within acceptance criteria with any exceptions noted below.

Duplicate Sample:
All duplicate sample results were within method acceptance criteria with any exceptions noted below.

Additional Comments:

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PROJECT NARRATIVE

Project: Black Pine Mine REV
Pace Project No.: 10163644

Method: **Modified Sobek 3.2**
Description: Sobek SMP Buffer pH
Client: Montana Dept. of Environmental Quality
Date: October 18, 2011

General Information:
8 samples were analyzed for Modified Sobek 3.2. All samples were received in acceptable condition with any exceptions noted below.

Hold Time:
The samples were analyzed within the method required hold times with any exceptions noted below.

Initial Calibrations (including MS Tune as applicable):
All criteria were within method requirements with any exceptions noted below.

Continuing Calibration:
All criteria were within method requirements with any exceptions noted below.

Internal Standards:
All internal standards were within QC limits with any exceptions noted below.

Surrogates:
All surrogates were within QC limits with any exceptions noted below.

Method Blank:
All analytes were below the report limit in the method blank with any exceptions noted below.

Laboratory Control Spike:
All laboratory control spike compounds were within QC limits with any exceptions noted below.

Matrix Spikes:
All percent recoveries and relative percent differences (RPDs) were within acceptance criteria with any exceptions noted below.

Duplicate Sample:
All duplicate sample results were within method acceptance criteria with any exceptions noted below.

Additional Comments:

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PROJECT NARRATIVE

Project: Black Pine Mine REV
Pace Project No.: 10163644

Method: **ASA 10-3.3**
Description: ASA10-3.3 Specific Conductance
Client: Montana Dept. of Environmental Quality
Date: October 18, 2011

General Information:
3 samples were analyzed for ASA 10-3.3. All samples were received in acceptable condition with any exceptions noted below.

Hold Time:
The samples were analyzed within the method required hold times with any exceptions noted below.

Initial Calibrations (including MS Tune as applicable):
All criteria were within method requirements with any exceptions noted below.

Continuing Calibration:
All criteria were within method requirements with any exceptions noted below.

Internal Standards:
All internal standards were within QC limits with any exceptions noted below.

Surrogates:
All surrogates were within QC limits with any exceptions noted below.

Method Blank:
All analytes were below the report limit in the method blank with any exceptions noted below.

Laboratory Control Spike:
All laboratory control spike compounds were within QC limits with any exceptions noted below.

Matrix Spikes:
All percent recoveries and relative percent differences (RPDs) were within acceptance criteria with any exceptions noted below.

Duplicate Sample:
All duplicate sample results were within method acceptance criteria with any exceptions noted below.

QC Batch: MT/6547

D6: The relative percent difference (RPD) between the sample and sample duplicate exceeded laboratory control limits.

- DUP (Lab ID: 1022943)
  - Sp.Conductance Saturated Paste

Additional Comments:

This data package has been reviewed for quality and completeness and is approved for release.

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ANALYTICAL RESULTS

Project: Black Pine Mine REV
Pace Project No.: 10163644

Sample: BP-CMN-SS-10-00 **Lab ID: 10163644001** Collected: 07/14/11 14:55 Received: 07/16/11 11:30 Matrix: Solid

Results reported on a "dry-weight" basis

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
6020 MET ICPMS	Analytical Method: EPA 6020 Preparation Method: EPA 3050							
Antimony	**15.0**	mg/kg	0.41	20	07/25/11 09:00	07/29/11 20:41	7440-36-0	M6
Arsenic	**8.6**	mg/kg	0.41	20	07/25/11 09:00	07/29/11 20:41	7440-38-2	M6
Barium	**237**	mg/kg	0.25	20	07/25/11 09:00	07/29/11 20:41	7440-39-3	M6
Cadmium	**1.4**	mg/kg	0.066	20	07/25/11 09:00	07/29/11 20:41	7440-43-9	
Chromium	**3.3**	mg/kg	0.41	20	07/25/11 09:00	07/29/11 20:41	7440-47-3	
Cobalt	**4.7**	mg/kg	0.41	20	07/25/11 09:00	07/29/11 20:41	7440-48-4	
Copper	**139**	mg/kg	0.41	20	07/25/11 09:00	07/29/11 20:41	7440-50-8	M6
Iron	**6800**	mg/kg	41.4	20	07/25/11 09:00	07/29/11 20:41	7439-89-6	M6
Lead	**15.8**	mg/kg	0.083	20	07/25/11 09:00	07/29/11 20:41	7439-92-1	M6
Manganese	**1170**	mg/kg	2.1	100	07/25/11 09:00	07/29/11 20:44	7439-96-5	M6
Nickel	**6.1**	mg/kg	0.41	20	07/25/11 09:00	07/29/11 20:41	7440-02-0	
Zinc	**93.2**	mg/kg	4.1	20	07/25/11 09:00	07/29/11 20:41	7440-66-6	M6
7471 Mercury	Analytical Method: EPA 7471 Preparation Method: EPA 7471							
Mercury	**0.044**	mg/kg	0.020	1	07/22/11 14:31	08/01/11 13:46	7439-97-6	
Dry Weight	Analytical Method: % Moisture							
Percent Moisture	**15.0**	%	0.10	1		07/25/11 00:00		
Sobek Acid Base Potential	Analytical Method: Modified Sobek 3.2							
Neutralization Potential	**2.4**	tons/1000	0.50	1		08/01/11 00:00		
Sobek Extractable Sulfur	Analytical Method: Modified Sobek 3.2							
Sulfur, HCl Extractable	**<0.050**	% (w/w)	0.050	1		08/09/11 08:54		
Sulfur, HNO3 Extractable	**<0.050**	% (w/w)	0.050	1		08/09/11 08:54		
Sulfur, Hot Water Extractable	**<0.050**	% (w/w)	0.050	1		08/09/11 08:54		
Sulfur, Residual	**<0.050**	% (w/w)	0.050	1		08/09/11 08:54		
Total Sulfur	**<0.050**	% (w/w)	0.050	1		08/09/11 08:54		
Sobek Calculations	Analytical Method: Modified Sobek 3.2							
Acid/Base Potential	**2.4**	tons/1000		1		08/01/11 00:00		
Acid Potential	**<4.3**	tons/1000	4.3	1		08/01/11 00:00		
Lime Requirement	**<5.4**	tons/1000	5.4	1		08/01/11 00:00		
SMP Lime Requirement	**2.4**	tons/1000	0.0	1		08/01/11 00:00		
Sobek SMP Buffer pH	Analytical Method: Modified Sobek 3.2							
SMP Buffer pH	**6.6**	Std. Units	0.10	1		07/29/11 13:24		

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ANALYTICAL RESULTS

Project: Black Pine Mine REV
Pace Project No.: 10163644

Sample: BP-CMN-SS-10-04 **Lab ID: 10163644002** Collected: 07/14/11 15:00 Received: 07/16/11 11:30 Matrix: Solid

Results reported on a "dry-weight" basis

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
6020 MET ICPMS	Analytical Method: EPA 6020 Preparation Method: EPA 3050							
Antimony	**5.4**	mg/kg	0.60	20	07/25/11 09:00	07/29/11 20:48	7440-36-0	
Arsenic	**14.1**	mg/kg	0.60	20	07/25/11 09:00	07/29/11 20:48	7440-38-2	
Barium	**136**	mg/kg	0.36	20	07/25/11 09:00	07/29/11 20:48	7440-39-3	
Cadmium	**0.32**	mg/kg	0.095	20	07/25/11 09:00	07/29/11 20:48	7440-43-9	
Chromium	**4.8**	mg/kg	0.60	20	07/25/11 09:00	07/29/11 20:48	7440-47-3	
Cobalt	**12.7**	mg/kg	0.60	20	07/25/11 09:00	07/29/11 20:48	7440-48-4	
Copper	**38.1**	mg/kg	0.60	20	07/25/11 09:00	07/29/11 20:48	7440-50-8	
Iron	**17100**	mg/kg	59.6	20	07/25/11 09:00	07/29/11 20:48	7439-89-6	
Lead	**24.9**	mg/kg	0.12	20	07/25/11 09:00	07/29/11 20:48	7439-92-1	
Manganese	**510**	mg/kg	0.60	20	07/25/11 09:00	07/29/11 20:48	7439-96-5	
Nickel	**7.8**	mg/kg	0.60	20	07/25/11 09:00	07/29/11 20:48	7440-02-0	
Zinc	**44.8**	mg/kg	6.0	20	07/25/11 09:00	07/29/11 20:48	7440-66-6	
7471 Mercury	Analytical Method: EPA 7471 Preparation Method: EPA 7471							
Mercury	**0.043**	mg/kg	0.021	1	07/22/11 14:31	08/01/11 13:48	7439-97-6	
Dry Weight	Analytical Method: % Moisture							
Percent Moisture	**20.1**	%	0.10	1		07/25/11 00:00		

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ANALYTICAL RESULTS

Project: Black Pine Mine REV
Pace Project No.: 10163644

Sample: BP-CMN-SS-14-00 **Lab ID: 10163644003** Collected: 07/14/11 15:15 Received: 07/16/11 11:30 Matrix: Solid

Results reported on a "dry-weight" basis

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
6020 MET ICPMS	Analytical Method: EPA 6020 Preparation Method: EPA 3050							
Antimony	**3.1**	mg/kg	0.50	20	07/25/11 09:00	07/29/11 20:55	7440-36-0	
Arsenic	**19.1**	mg/kg	2.5	100	07/25/11 09:00	07/29/11 21:13	7440-38-2	
Barium	**177**	mg/kg	0.30	20	07/25/11 09:00	07/29/11 20:55	7440-39-3	
Cadmium	**2.8**	mg/kg	0.079	20	07/25/11 09:00	07/29/11 20:55	7440-43-9	
Chromium	**6.8**	mg/kg	0.50	20	07/25/11 09:00	07/29/11 20:55	7440-47-3	
Cobalt	**5.6**	mg/kg	0.50	20	07/25/11 09:00	07/29/11 20:55	7440-48-4	
Copper	**321**	mg/kg	2.5	100	07/25/11 09:00	07/29/11 21:13	7440-50-8	
Iron	**15700**	mg/kg	49.5	20	07/25/11 09:00	07/29/11 20:55	7439-89-6	
Lead	**19.3**	mg/kg	0.099	20	07/25/11 09:00	07/29/11 20:55	7439-92-1	
Manganese	**298**	mg/kg	0.50	20	07/25/11 09:00	07/29/11 20:55	7439-96-5	
Nickel	**6.7**	mg/kg	2.5	100	07/25/11 09:00	07/29/11 21:13	7440-02-0	
Zinc	**163**	mg/kg	24.8	100	07/25/11 09:00	07/29/11 21:13	7440-66-6	
7471 Mercury	Analytical Method: EPA 7471 Preparation Method: EPA 7471							
Mercury	**0.13**	mg/kg	0.024	1	07/22/11 14:31	08/01/11 13:50	7439-97-6	
Dry Weight	Analytical Method: % Moisture							
Percent Moisture	**30.4**	%	0.10	1		07/25/11 00:00		
Sobek Acid Base Potential	Analytical Method: Modified Sobek 3.2							
Neutralization Potential	**1.5**	tons/1000	0.50	1		08/01/11 00:00		
Sobek Extractable Sulfur	Analytical Method: Modified Sobek 3.2							
Sulfur, HCl Extractable	**<0.050**	% (w/w)	0.050	1		08/09/11 09:09		
Sulfur, HNO3 Extractable	**<0.050**	% (w/w)	0.050	1		08/09/11 09:09		
Sulfur, Hot Water Extractable	**<0.050**	% (w/w)	0.050	1		08/09/11 09:09		
Sulfur, Residual	**<0.050**	% (w/w)	0.050	1		08/09/11 09:09		
Total Sulfur	**<0.050**	% (w/w)	0.050	1		08/09/11 09:09		
Sobek Calculations	Analytical Method: Modified Sobek 3.2							
Acid/Base Potential	**1.5**	tons/1000		1		08/01/11 00:00		
Acid Potential	**<4.3**	tons/1000	4.3	1		08/01/11 00:00		
Lime Requirement	**8.3**	tons/1000	5.4	1		08/01/11 00:00		
SMP Lime Requirement	**6.0**	tons/1000	0.0	1		08/01/11 00:00		
Sobek SMP Buffer pH	Analytical Method: Modified Sobek 3.2							
SMP Buffer pH	**6.0**	Std. Units	0.10	1		07/29/11 03:24		

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ANALYTICAL RESULTS

Project: Black Pine Mine REV
Pace Project No.: 10163644

Sample: BP-CMN-SS-14-04 **Lab ID: 10163644004** Collected: 07/14/11 15:20 Received: 07/16/11 11:30 Matrix: Solid

Results reported on a "dry-weight" basis

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
6020 MET ICPMS	Analytical Method: EPA 6020 Preparation Method: EPA 3050							
Antimony	**17.4**	mg/kg	0.57	20	07/25/11 09:00	07/29/11 21:16	7440-36-0	
Arsenic	**19.9**	mg/kg	0.57	20	07/25/11 09:00	07/29/11 21:16	7440-38-2	
Barium	**312**	mg/kg	0.34	20	07/25/11 09:00	07/29/11 21:16	7440-39-3	
Cadmium	**6.9**	mg/kg	0.091	20	07/25/11 09:00	07/29/11 21:16	7440-43-9	
Chromium	**4.3**	mg/kg	0.57	20	07/25/11 09:00	07/29/11 21:16	7440-47-3	
Cobalt	**5.1**	mg/kg	0.57	20	07/25/11 09:00	07/29/11 21:16	7440-48-4	
Copper	**917**	mg/kg	2.8	100	07/25/11 09:00	07/29/11 21:20	7440-50-8	
Iron	**7080**	mg/kg	56.9	20	07/25/11 09:00	07/29/11 21:16	7439-89-6	
Lead	**108**	mg/kg	0.11	20	07/25/11 09:00	07/29/11 21:16	7439-92-1	
Manganese	**602**	mg/kg	2.8	100	07/25/11 09:00	07/29/11 21:20	7439-96-5	
Nickel	**7.3**	mg/kg	0.57	20	07/25/11 09:00	07/29/11 21:16	7440-02-0	
Zinc	**279**	mg/kg	5.7	20	07/25/11 09:00	07/29/11 21:16	7440-66-6	
7471 Mercury	Analytical Method: EPA 7471 Preparation Method: EPA 7471							
Mercury	**0.022**	mg/kg	0.022	1	07/22/11 14:31	08/01/11 13:56	7439-97-6	
Dry Weight	Analytical Method: % Moisture							
Percent Moisture	**15.6**	%	0.10	1		07/25/11 00:00		

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ANALYTICAL RESULTS

Project: Black Pine Mine REV
Pace Project No.: 10163644

Sample: BP-CMN-SS-13-00 **Lab ID: 10163644005** Collected: 07/14/11 15:50 Received: 07/16/11 11:30 Matrix: Solid

Results reported on a "dry-weight" basis

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
6020 MET ICPMS	Analytical Method: EPA 6020 Preparation Method: EPA 3050							
Antimony	**396**	mg/kg	0.59	20	07/25/11 09:00	07/29/11 21:23	7440-36-0	
Arsenic	**250**	mg/kg	0.59	20	07/25/11 09:00	07/29/11 21:23	7440-38-2	
Barium	**254**	mg/kg	0.35	20	07/25/11 09:00	07/29/11 21:23	7440-39-3	
Cadmium	**11.2**	mg/kg	0.095	20	07/25/11 09:00	07/29/11 21:23	7440-43-9	
Chromium	**<3.0**	mg/kg	3.0	100	07/25/11 09:00	07/29/11 21:27	7440-47-3	
Cobalt	**4.2**	mg/kg	0.59	20	07/25/11 09:00	07/29/11 21:23	7440-48-4	
Copper	**885**	mg/kg	3.0	100	07/25/11 09:00	07/29/11 21:27	7440-50-8	
Iron	**11700**	mg/kg	59.1	20	07/25/11 09:00	07/29/11 21:23	7439-89-6	
Lead	**1890**	mg/kg	0.59	100	07/25/11 09:00	07/29/11 21:27	7439-92-1	
Manganese	**540**	mg/kg	3.0	100	07/25/11 09:00	07/29/11 21:27	7439-96-5	
Nickel	**5.8**	mg/kg	3.0	100	07/25/11 09:00	07/29/11 21:27	7440-02-0	
Zinc	**877**	mg/kg	29.6	100	07/25/11 09:00	07/29/11 21:27	7440-66-6	
7471 Mercury	Analytical Method: EPA 7471 Preparation Method: EPA 7471							
Mercury	**1.4**	mg/kg	0.031	1	07/22/11 14:31	08/01/11 13:58	7439-97-6	
Dry Weight	Analytical Method: % Moisture							
Percent Moisture	**33.9**	%	0.10	1		07/25/11 00:00		
Sobek Acid Base Potential	Analytical Method: Modified Sobek 3.2							
Neutralization Potential	**1.5**	tons/1000	0.50	1		08/01/11 00:00		
Sobek Extractable Sulfur	Analytical Method: Modified Sobek 3.2							
Sulfur, HCl Extractable	**<0.050**	% (w/w)	0.050	1		08/09/11 09:19		
Sulfur, HNO3 Extractable	**<0.050**	% (w/w)	0.050	1		08/09/11 09:19		
Sulfur, Hot Water Extractable	**<0.050**	% (w/w)	0.050	1		08/09/11 09:19		
Sulfur, Residual	**<0.050**	% (w/w)	0.050	1		08/09/11 09:19		
Total Sulfur	**0.0751**	% (w/w)	0.050	1		08/09/11 09:19		
Sobek Calculations	Analytical Method: Modified Sobek 3.2							
Acid/Base Potential	**1.5**	tons/1000		1		08/01/11 00:00		
Acid Potential	**<4.3**	tons/1000	4.3	1		08/01/11 00:00		
Lime Requirement	**13**	tons/1000	5.4	1		08/01/11 00:00		
SMP Lime Requirement	**8.9**	tons/1000	0.0	1		08/01/11 00:00		
Sobek SMP Buffer pH	Analytical Method: Modified Sobek 3.2							
SMP Buffer pH	**5.7**	Std. Units	0.10	1		07/29/11 13:24		

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ANALYTICAL RESULTS

Project: Black Pine Mine REV
Pace Project No.: 10163644

Sample: BP-CMN-SS-13-04 **Lab ID: 10163644006** Collected: 07/14/11 15:55 Received: 07/16/11 11:30 Matrix: Solid

Results reported on a "dry-weight" basis

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
6010 MET ICP, MDEQ Potassium	Analytical Method: CLPICPAES Preparation Method: ASA 13-3.5.2.2							
Potassium	**<121**	mg/kg	121	5	08/01/11 17:34	08/01/11 19:16	7440-09-7	
Cation Exchange Capacity	Analytical Method: EPA 9081							
Cation Exchange Capacity	**24.6**	meq/100g	1.0	10	08/03/11 14:00	08/05/11 13:57		
6020 MET ICPMS	Analytical Method: EPA 6020 Preparation Method: EPA 3050							
Antimony	**2.4**	mg/kg	0.58	20	07/25/11 09:00	07/29/11 21:30	7440-36-0	
Arsenic	**8.3**	mg/kg	2.9	100	07/25/11 09:00	07/29/11 21:34	7440-38-2	
Barium	**173**	mg/kg	0.35	20	07/25/11 09:00	07/29/11 21:30	7440-39-3	
Cadmium	**<0.093**	mg/kg	0.093	20	07/25/11 09:00	07/29/11 21:30	7440-43-9	
Chromium	**9.4**	mg/kg	2.9	100	07/25/11 09:00	07/29/11 21:34	7440-47-3	
Cobalt	**4.3**	mg/kg	0.58	20	07/25/11 09:00	07/29/11 21:30	7440-48-4	
Copper	**14.5**	mg/kg	2.9	100	07/25/11 09:00	07/29/11 21:34	7440-50-8	
Iron	**13400**	mg/kg	58.0	20	07/25/11 09:00	07/29/11 21:30	7439-89-6	
Lead	**24.4**	mg/kg	0.12	20	07/25/11 09:00	07/29/11 21:30	7439-92-1	
Manganese	**170**	mg/kg	2.9	100	07/25/11 09:00	07/29/11 21:34	7439-96-5	
Nickel	**8.0**	mg/kg	2.9	100	07/25/11 09:00	07/29/11 21:34	7440-02-0	
Zinc	**41.4**	mg/kg	29.0	100	07/25/11 09:00	07/29/11 21:34	7440-66-6	
7471 Mercury	Analytical Method: EPA 7471 Preparation Method: EPA 7471							
Mercury	**0.026**	mg/kg	0.022	1	07/22/11 14:31	08/01/11 14:00	7439-97-6	
Dry Weight	Analytical Method: % Moisture							
Percent Moisture	**20.2**	%	0.10	1		07/25/11 00:00		
353.2 Nitrate + Nitrite pres.	Analytical Method: ASA 33-3.2/EPA 353.2							
Available Nitrate	**<5.0**	mg/kg	5.0	1		07/26/11 18:15		
Coarse	Analytical Method: ASTM D421							
Coarse Fragment	**33.4**	% (w/w)	0.10	1		07/26/11 12:15		
Organic Matter MT ASA 29	Analytical Method: ASA 29-3.5.2							
Organic Matter	**<0.10**	% (w/w)	0.10	1		07/21/11 16:50		
ASA 10-3.2 pH	Analytical Method: ASA 10-3.2							
pH, Saturated Paste	**7.2**	Std. Units	0.10	1		07/27/11 17:38		
SM4500P-E, Total Phosphorus	Analytical Method: ASA 24-5.4/SM4500							
Available Phosphorus	**1.4**	mg/kg	1.0	1		07/25/11 14:48	7723-14-0	
Sobek Acid Base Potential	Analytical Method: Modified Sobek 3.2							
Neutralization Potential	**3.3**	tons/1000	0.50	1		07/29/11 00:00		

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ANALYTICAL RESULTS

Project: Black Pine Mine REV
Pace Project No.: 10163644

Sample: BP-CMN-SS-13-04 **Lab ID: 10163644006** Collected: 07/14/11 15:55 Received: 07/16/11 11:30 Matrix: Solid

Results reported on a "dry-weight" basis

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
Sobek Extractable Sulfur	Analytical Method: Modified Sobek 3.2							
Sulfur, HCl Extractable	**<0.050**	% (w/w)	0.050	1		07/26/11 15:00		
Sulfur, HNO3 Extractable	**<0.050**	% (w/w)	0.050	1		07/26/11 15:00		
Sulfur, Hot Water Extractable	**<0.050**	% (w/w)	0.050	1		07/26/11 15:00		
Sulfur, Residual	**<0.050**	% (w/w)	0.050	1		07/26/11 15:00		
Total Sulfur	**<0.050**	% (w/w)	0.050	1		07/26/11 15:00		
Sobek Calculations	Analytical Method: Modified Sobek 3.2							
Acid/Base Potential	**3.3**	tons/1000		1		07/26/11 15:00		
Acid Potential	**<4.3**	tons/1000	4.3	1		07/26/11 15:00		
Lime Requirement	**<5.4**	tons/1000	5.4	1		07/26/11 15:00		
SMP Lime Requirement	**0.3**	tons/1000	0.0	1		07/26/11 15:00		
Sobek SMP Buffer pH	Analytical Method: Modified Sobek 3.2							
SMP Buffer pH	**6.9**	Std. Units	0.10	1		07/26/11 15:00		
ASA10-3.3 Specific Conductance	Analytical Method: ASA 10-3.3							
Sp.Conductance Saturated Paste	**204**	mmhos/cm	0.010	1		08/03/11 19:49		

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ANALYTICAL RESULTS

Project: Black Pine Mine REV
Pace Project No.: 10163644

Sample: BP-CMN-SS-12-00 **Lab ID: 10163644007** Collected: 07/14/11 16:15 Received: 07/16/11 11:30 Matrix: Solid

Results reported on a "dry-weight" basis

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
6020 MET ICPMS	Analytical Method: EPA 6020 Preparation Method: EPA 3050							
Antimony	**9.1**	mg/kg	0.60	20	07/25/11 09:00	07/29/11 21:37	7440-36-0	
Arsenic	**12.3**	mg/kg	3.0	100	07/25/11 09:00	07/29/11 21:41	7440-38-2	
Barium	**160**	mg/kg	0.36	20	07/25/11 09:00	07/29/11 21:37	7440-39-3	
Cadmium	**1.1**	mg/kg	0.097	20	07/25/11 09:00	07/29/11 21:37	7440-43-9	
Chromium	**4.3**	mg/kg	3.0	100	07/25/11 09:00	07/29/11 21:41	7440-47-3	
Cobalt	**2.5**	mg/kg	0.60	20	07/25/11 09:00	07/29/11 21:37	7440-48-4	
Copper	**105**	mg/kg	3.0	100	07/25/11 09:00	07/29/11 21:41	7440-50-8	
Iron	**6400**	mg/kg	60.3	20	07/25/11 09:00	07/29/11 21:37	7439-89-6	
Lead	**59.0**	mg/kg	0.12	20	07/25/11 09:00	07/29/11 21:37	7439-92-1	
Manganese	**316**	mg/kg	3.0	100	07/25/11 09:00	07/29/11 21:41	7439-96-5	
Nickel	**14.8**	mg/kg	3.0	100	07/25/11 09:00	07/29/11 21:41	7440-02-0	
Zinc	**127**	mg/kg	30.2	100	07/25/11 09:00	07/29/11 21:41	7440-66-6	
7471 Mercury	Analytical Method: EPA 7471 Preparation Method: EPA 7471							
Mercury	**0.062**	mg/kg	0.024	1	07/22/11 14:31	08/01/11 14:02	7439-97-6	
Dry Weight	Analytical Method: % Moisture							
Percent Moisture	**20.3**	%	0.10	1		07/25/11 00:00		
Sobek Acid Base Potential	Analytical Method: Modified Sobek 3.2							
Neutralization Potential	**2.2**	tons/1000	0.50	1		08/01/11 00:00		
Sobek Extractable Sulfur	Analytical Method: Modified Sobek 3.2							
Sulfur, HCl Extractable	**<0.050**	% (w/w)	0.050	1		08/09/11 09:31		
Sulfur, HNO3 Extractable	**<0.050**	% (w/w)	0.050	1		08/09/11 09:31		
Sulfur, Hot Water Extractable	**<0.050**	% (w/w)	0.050	1		08/09/11 09:31		
Sulfur, Residual	**<0.050**	% (w/w)	0.050	1		08/09/11 09:31		
Total Sulfur	**<0.050**	% (w/w)	0.050	1		08/09/11 09:31		
Sobek Calculations	Analytical Method: Modified Sobek 3.2							
Acid/Base Potential	**2.2**	tons/1000		1		08/01/11 00:00		
Acid Potential	**<4.3**	tons/1000	4.3	1		08/01/11 00:00		
Lime Requirement	**<5.4**	tons/1000	5.4	1		08/01/11 00:00		
SMP Lime Requirement	**1.0**	tons/1000	0.0	1		08/01/11 00:00		
Sobek SMP Buffer pH	Analytical Method: Modified Sobek 3.2							
SMP Buffer pH	**6.8**	Std. Units	0.10	1		07/29/11 13:24		

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ANALYTICAL RESULTS

Project: Black Pine Mine REV
Pace Project No.: 10163644

Sample: BP-CMN-SS-12-04 **Lab ID: 10163644008** Collected: 07/14/11 16:20 Received: 07/16/11 11:30 Matrix: Solid

Results reported on a "dry-weight" basis

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
6010 MET ICP, MDEQ Potassium	Analytical Method: CLPICPAES Preparation Method: ASA 13-3.5.2.2							
Potassium	**<120**	mg/kg	120	5	08/01/11 17:34	08/01/11 19:20	7440-09-7	
Cation Exchange Capacity	Analytical Method: EPA 9081							
Cation Exchange Capacity	**23.0**	meq/100g	0.98	10	08/03/11 14:00	08/05/11 14:00		
6020 MET ICPMS	Analytical Method: EPA 6020 Preparation Method: EPA 3050							
Antimony	**2.1**	mg/kg	0.50	20	07/25/11 09:00	07/29/11 21:44	7440-36-0	
Arsenic	**10.4**	mg/kg	2.5	100	07/25/11 09:00	07/29/11 21:58	7440-38-2	
Barium	**222**	mg/kg	0.30	20	07/25/11 09:00	07/29/11 21:44	7440-39-3	
Cadmium	**0.19**	mg/kg	0.080	20	07/25/11 09:00	07/29/11 21:44	7440-43-9	
Chromium	**8.2**	mg/kg	2.5	100	07/25/11 09:00	07/29/11 21:58	7440-47-3	
Cobalt	**7.5**	mg/kg	0.50	20	07/25/11 09:00	07/29/11 21:44	7440-48-4	
Copper	**22.3**	mg/kg	2.5	100	07/25/11 09:00	07/29/11 21:58	7440-50-8	
Iron	**13300**	mg/kg	50.1	20	07/25/11 09:00	07/29/11 21:44	7439-89-6	
Lead	**23.3**	mg/kg	0.10	20	07/25/11 09:00	07/29/11 21:44	7439-92-1	
Manganese	**239**	mg/kg	2.5	100	07/25/11 09:00	07/29/11 21:58	7439-96-5	
Nickel	**8.9**	mg/kg	2.5	100	07/25/11 09:00	07/29/11 21:58	7440-02-0	
Zinc	**54.0**	mg/kg	25.1	100	07/25/11 09:00	07/29/11 21:58	7440-66-6	
7471 Mercury	Analytical Method: EPA 7471 Preparation Method: EPA 7471							
Mercury	**0.029**	mg/kg	0.025	1	07/22/11 14:31	08/01/11 14:04	7439-97-6	
Dry Weight	Analytical Method: % Moisture							
Percent Moisture	**20.2**	%	0.10	1		07/25/11 00:00		
353.2 Nitrate + Nitrite pres.	Analytical Method: ASA 33-3.2/EPA 353.2							
Available Nitrate	**<5.0**	mg/kg	5.0	1		07/26/11 18:17		
Coarse	Analytical Method: ASTM D421							
Coarse Fragment	**11.7**	% (w/w)	0.10	1		07/26/11 12:15		
Organic Matter MT ASA 29	Analytical Method: ASA 29-3.5.2							
Organic Matter	**<0.10**	% (w/w)	0.10	1		07/21/11 16:50		
ASA 10-3.2 pH	Analytical Method: ASA 10-3.2							
pH, Saturated Paste	**6.8**	Std. Units	0.10	1		07/27/11 17:39		
SM4500P-E, Total Phosphorus	Analytical Method: ASA 24-5.4/SM4500							
Available Phosphorus	**<1.0**	mg/kg	1.0	1		07/25/11 14:49	7723-14-0	
Sobek Acid Base Potential	Analytical Method: Modified Sobek 3.2							
Neutralization Potential	**3.5**	tons/1000	0.50	1		07/29/11 00:00		

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ANALYTICAL RESULTS

Project: Black Pine Mine REV
Pace Project No.: 10163644

Sample: BP-CMN-SS-12-04 **Lab ID: 10163644008** Collected: 07/14/11 16:20 Received: 07/16/11 11:30 Matrix: Solid

Results reported on a "dry-weight" basis

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
Sobek Extractable Sulfur	Analytical Method: Modified Sobek 3.2							
Sulfur, HCl Extractable	**<0.050**	% (w/w)	0.050	1		07/26/11 15:00		
Sulfur, HNO3 Extractable	**<0.050**	% (w/w)	0.050	1		07/26/11 15:00		
Sulfur, Hot Water Extractable	**<0.050**	% (w/w)	0.050	1		07/26/11 15:00		
Sulfur, Residual	**<0.050**	% (w/w)	0.050	1		07/26/11 15:00		
Total Sulfur	**<0.050**	% (w/w)	0.050	1		07/26/11 15:00		
Sobek Calculations	Analytical Method: Modified Sobek 3.2							
Acid/Base Potential	**3.5**	tons/1000		1		07/26/11 15:00		
Acid Potential	**<4.3**	tons/1000	4.3	1		07/26/11 15:00		
Lime Requirement	**<5.4**	tons/1000	5.4	1		07/26/11 15:00		
SMP Lime Requirement	**0**	tons/1000	0.0	1		07/26/11 15:00		
Sobek SMP Buffer pH	Analytical Method: Modified Sobek 3.2							
SMP Buffer pH	**7.0**	Std. Units	0.10	1		07/26/11 15:00		
ASA10-3.3 Specific Conductance	Analytical Method: ASA 10-3.3							
Sp.Conductance Saturated Paste	**0.91**	mmhos/cm	0.010	1		07/27/11 12:56		

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ANALYTICAL RESULTS

Project: Black Pine Mine REV
Pace Project No.: 10163644

Sample: BP-CMN-SS-11-00 **Lab ID: 10163644009** Collected: 07/14/11 16:40 Received: 07/16/11 11:30 Matrix: Solid

Results reported on a "dry-weight" basis

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
6020 MET ICPMS	Analytical Method: EPA 6020 Preparation Method: EPA 3050							
Antimony	**16.2**	mg/kg	0.51	20	07/25/11 09:00	07/29/11 22:02	7440-36-0	
Arsenic	**22.5**	mg/kg	0.51	20	07/25/11 09:00	07/29/11 22:02	7440-38-2	
Barium	**130**	mg/kg	0.31	20	07/25/11 09:00	07/29/11 22:02	7440-39-3	
Cadmium	**1.2**	mg/kg	0.082	20	07/25/11 09:00	07/29/11 22:02	7440-43-9	
Chromium	**4.8**	mg/kg	0.51	20	07/25/11 09:00	07/29/11 22:02	7440-47-3	
Cobalt	**4.3**	mg/kg	0.51	20	07/25/11 09:00	07/29/11 22:02	7440-48-4	
Copper	**64.2**	mg/kg	0.51	20	07/25/11 09:00	07/29/11 22:02	7440-50-8	
Iron	**8570**	mg/kg	51.5	20	07/25/11 09:00	07/29/11 22:02	7439-89-6	
Lead	**110**	mg/kg	0.10	20	07/25/11 09:00	07/29/11 22:02	7439-92-1	
Manganese	**311**	mg/kg	0.51	20	07/25/11 09:00	07/29/11 22:02	7439-96-5	
Nickel	**5.5**	mg/kg	0.51	20	07/25/11 09:00	07/29/11 22:02	7440-02-0	
Zinc	**133**	mg/kg	5.1	20	07/25/11 09:00	07/29/11 22:02	7440-66-6	
7471 Mercury	Analytical Method: EPA 7471 Preparation Method: EPA 7471							
Mercury	**0.070**	mg/kg	0.021	1	07/22/11 14:31	08/01/11 14:07	7439-97-6	
Dry Weight	Analytical Method: % Moisture							
Percent Moisture	**9.2**	%	0.10	1		07/25/11 00:00		
Sobek Acid Base Potential	Analytical Method: Modified Sobek 3.2							
Neutralization Potential	**1.5**	tons/1000	0.50	1		08/01/11 00:00		
Sobek Extractable Sulfur	Analytical Method: Modified Sobek 3.2							
Sulfur, HCl Extractable	**<0.050**	% (w/w)	0.050	1		08/09/11 09:47		
Sulfur, HNO3 Extractable	**<0.050**	% (w/w)	0.050	1		08/09/11 09:47		
Sulfur, Hot Water Extractable	**<0.050**	% (w/w)	0.050	1		08/09/11 09:47		
Sulfur, Residual	**<0.050**	% (w/w)	0.050	1		08/09/11 09:47		
Total Sulfur	**<0.050**	% (w/w)	0.050	1		08/09/11 09:47		
Sobek Calculations	Analytical Method: Modified Sobek 3.2							
Acid/Base Potential	**1.5**	tons/1000		1		08/01/11 00:00		
Acid Potential	**<4.3**	tons/1000	4.3	1		08/01/11 00:00		
Lime Requirement	**<5.4**	tons/1000	5.4	1		08/01/11 00:00		
SMP Lime Requirement	**0**	tons/1000	0.0	1		08/01/11 00:00		
Sobek SMP Buffer pH	Analytical Method: Modified Sobek 3.2							
SMP Buffer pH	**7.2**	Std. Units	0.10	1		07/29/11 13:24		

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(406)254-7226

ANALYTICAL RESULTS

Project: Black Pine Mine REV
Pace Project No.: 10163644

Sample: BP-CMN-SS-11-04 **Lab ID: 10163644010** Collected: 07/14/11 16:45 Received: 07/16/11 11:30 Matrix: Solid

Results reported on a "dry-weight" basis

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
6010 MET ICP, MDEQ Potassium	Analytical Method: CLPICPAES Preparation Method: ASA 13-3.5.2.2							
Potassium	**<123**	mg/kg	123	5	08/01/11 17:34	08/01/11 19:25	7440-09-7	
Cation Exchange Capacity	Analytical Method: EPA 9081							
Cation Exchange Capacity	**21.7**	meq/100g	0.99	10	08/03/11 14:00	08/05/11 14:04		
6020 MET ICPMS	Analytical Method: EPA 6020 Preparation Method: EPA 3050							
Antimony	**4.1**	mg/kg	0.49	20	07/25/11 09:00	07/29/11 22:09	7440-36-0	
Arsenic	**29.5**	mg/kg	2.5	100	07/25/11 09:00	07/29/11 22:12	7440-38-2	
Barium	**116**	mg/kg	0.30	20	07/25/11 09:00	07/29/11 22:09	7440-39-3	
Cadmium	**<0.079**	mg/kg	0.079	20	07/25/11 09:00	07/29/11 22:09	7440-43-9	
Chromium	**6.2**	mg/kg	0.49	20	07/25/11 09:00	07/29/11 22:09	7440-47-3	
Cobalt	**12.6**	mg/kg	0.49	20	07/25/11 09:00	07/29/11 22:09	7440-48-4	
Copper	**18.4**	mg/kg	2.5	100	07/25/11 09:00	07/29/11 22:12	7440-50-8	
Iron	**27500**	mg/kg	247	100	07/25/11 09:00	07/29/11 22:12	7439-89-6	
Lead	**55.4**	mg/kg	0.099	20	07/25/11 09:00	07/29/11 22:09	7439-92-1	
Manganese	**610**	mg/kg	2.5	100	07/25/11 09:00	07/29/11 22:12	7439-96-5	
Nickel	**7.2**	mg/kg	2.5	100	07/25/11 09:00	07/29/11 22:12	7440-02-0	
Zinc	**43.1**	mg/kg	24.7	100	07/25/11 09:00	07/29/11 22:12	7440-66-6	
7471 Mercury	Analytical Method: EPA 7471 Preparation Method: EPA 7471							
Mercury	**0.030**	mg/kg	0.021	1	07/22/11 14:31	08/01/11 14:13	7439-97-6	
Dry Weight	Analytical Method: % Moisture							
Percent Moisture	**9.8**	%	0.10	1		07/25/11 00:00		
353.2 Nitrate + Nitrite pres.	Analytical Method: ASA 33-3.2/EPA 353.2							
Available Nitrate	**<5.0**	mg/kg	5.0	1		07/26/11 18:20		
Coarse	Analytical Method: ASTM D421							
Coarse Fragment	**10.9**	% (w/w)	0.10	1		07/26/11 12:15		
Organic Matter MT ASA 29	Analytical Method: ASA 29-3.5.2							
Organic Matter	**<0.10**	% (w/w)	0.10	1		07/21/11 16:50		
ASA 10-3.2 pH	Analytical Method: ASA 10-3.2							
pH, Saturated Paste	**7.2**	Std. Units	0.10	1		07/27/11 17:41		
SM4500P-E, Total Phosphorus	Analytical Method: ASA 24-5.4/SM4500							
Available Phosphorus	**<1.0**	mg/kg	1.0	1		07/25/11 14:50	7723-14-0	
Sobek Acid Base Potential	Analytical Method: Modified Sobek 3.2							
Neutralization Potential	**3.2**	tons/1000	0.50	1		07/29/11 00:00		

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ANALYTICAL RESULTS

Project: Black Pine Mine REV
Pace Project No.: 10163644

Sample: BP-CMN-SS-11-04 **Lab ID: 10163644010** Collected: 07/14/11 16:45 Received: 07/16/11 11:30 Matrix: Solid

Results reported on a "dry-weight" basis

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
Sobek Extractable Sulfur	Analytical Method: Modified Sobek 3.2							
Sulfur, HCl Extractable	**<0.050**	% (w/w)	0.050	1		07/26/11 15:00		
Sulfur, HNO3 Extractable	**<0.050**	% (w/w)	0.050	1		07/26/11 15:00		
Sulfur, Hot Water Extractable	**<0.050**	% (w/w)	0.050	1		07/26/11 15:00		
Sulfur, Residual	**<0.050**	% (w/w)	0.050	1		07/26/11 15:00		
Total Sulfur	**<0.050**	% (w/w)	0.050	1		07/26/11 15:00		
Sobek Calculations	Analytical Method: Modified Sobek 3.2							
Acid/Base Potential	**3.2**	tons/1000		1		07/26/11 15:00		
Acid Potential	**<4.3**	tons/1000	4.3	1		07/26/11 15:00		
Lime Requirement	**<5.4**	tons/1000	5.4	1		07/26/11 15:00		
SMP Lime Requirement	**0.3**	tons/1000	0.0	1		07/26/11 15:00		
Sobek SMP Buffer pH	Analytical Method: Modified Sobek 3.2							
SMP Buffer pH	**6.9**	Std. Units	0.10	1		07/26/11 15:00		
ASA10-3.3 Specific Conductance	Analytical Method: ASA 10-3.3							
Sp.Conductance Saturated Paste	**0.37**	mmhos/cm	0.010	1		07/27/11 12:56		

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QUALITY CONTROL DATA

Project: Black Pine Mine REV
Pace Project No.: 10163644

QC Batch: MPRP/27469 Analysis Method: CLPICPAES
QC Batch Method: ASA 13-3.5.2.2 Analysis Description: CLPICPAES MET
Associated Lab Samples: 10163644006, 10163644008, 10163644010

METHOD BLANK: 1024549 Matrix: Solid
Associated Lab Samples: 10163644006, 10163644008, 10163644010

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Potassium	mg/kg	<124	124	08/01/11 17:43	

LABORATORY CONTROL SAMPLE & LCSD: 1024550 1024551

Parameter	Units	Spike Conc.	LCS Result	LCSD Result	LCS % Rec	LCSD % Rec	% Rec Limits	RPD	Max RPD	Qualifiers
Potassium	mg/kg	156	177	210	114	135	80-120	17	20	

SAMPLE DUPLICATE: 1024552

Parameter	Units	10163634008 Result	Dup Result	RPD	Max RPD	Qualifiers
Potassium	mg/kg	<116	<125		30	

SAMPLE DUPLICATE: 1024553

Parameter	Units	10163644010 Result	Dup Result	RPD	Max RPD	Qualifiers
Potassium	mg/kg	<123	<125		30	

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QUALITY CONTROL DATA

Project: Black Pine Mine REV
Pace Project No.: 10163644

QC Batch: ICP/14917 Analysis Method: EPA 9081
QC Batch Method: EPA 9081 Analysis Description: Cation Exchange Capacity
Associated Lab Samples: 10163644006, 10163644008, 10163644010

METHOD BLANK: 853094 Matrix: Solid
Associated Lab Samples: 10163644006, 10163644008, 10163644010

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Cation Exchange Capacity	meq/100g	<1.0	1.0	08/05/11 13:25	

LABORATORY CONTROL SAMPLE: 853095

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Cation Exchange Capacity	meq/100g	53.2	53.1	100	62-138	

SAMPLE DUPLICATE: 853096

Parameter	Units	10163645001 Result	Dup Result	RPD	Max RPD	Qualifiers
Cation Exchange Capacity	meq/100g	14.7	14.1	4	47	

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QUALITY CONTROL DATA

Project: Black Pine Mine REV
Pace Project No.: 10163644

QC Batch: MPRP/27164 Analysis Method: EPA 6020
QC Batch Method: EPA 3050 Analysis Description: 6020 MET
Associated Lab Samples: 10163644001, 10163644002, 10163644003, 10163644004, 10163644005, 10163644006, 10163644007, 10163644008, 10163644009, 10163644010

METHOD BLANK: 1014838 Matrix: Solid
Associated Lab Samples: 10163644001, 10163644002, 10163644003, 10163644004, 10163644005, 10163644006, 10163644007, 10163644008, 10163644009, 10163644010

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Antimony	mg/kg	<0.49	0.49	07/29/11 18:56	
Arsenic	mg/kg	<0.49	0.49	07/29/11 18:56	
Barium	mg/kg	<0.29	0.29	07/29/11 18:56	
Cadmium	mg/kg	<0.078	0.078	07/29/11 18:56	
Chromium	mg/kg	<0.49	0.49	07/29/11 18:56	
Cobalt	mg/kg	<0.49	0.49	07/29/11 18:56	
Copper	mg/kg	<0.49	0.49	07/29/11 18:56	
Iron	mg/kg	<49.0	49.0	07/29/11 18:56	
Lead	mg/kg	<0.098	0.098	07/29/11 18:56	
Manganese	mg/kg	<0.49	0.49	07/29/11 18:56	
Nickel	mg/kg	<0.49	0.49	07/29/11 18:56	
Zinc	mg/kg	<4.9	4.9	07/29/11 18:56	

LABORATORY CONTROL SAMPLE: 1014839

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Antimony	mg/kg	19.4	21.2	109	75-125	
Arsenic	mg/kg	19.4	21.1	109	75-125	
Barium	mg/kg	19.4	20.1	104	75-125	
Cadmium	mg/kg	19.4	19.8	102	75-125	
Chromium	mg/kg	19.4	20.5	105	75-125	
Cobalt	mg/kg	19.4	21.2	109	75-125	
Copper	mg/kg	19.4	20.6	106	75-125	
Iron	mg/kg	243	258	106	75-125	
Lead	mg/kg	19.4	20.2	104	75-125	
Manganese	mg/kg	19.4	20.1	104	75-125	
Nickel	mg/kg	19.4	21.5	111	75-125	
Zinc	mg/kg	19.4	20.7	106	75-125	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 1014840 1014841

Parameter	Units	10163643001 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Antimony	mg/kg	529	23.7	19.3	523	420	-26	-566	75-125	22	20	D6,M6
Arsenic	mg/kg	496	23.7	19.3	469	395	-115	-522	75-125	17	20	M6
Barium	mg/kg	289	23.7	19.3	332	266	181	-122	75-125	22	20	D6,M6
Cadmium	mg/kg	7.5	23.7	19.3	31.5	22.4	101	77	75-125	33	20	D6
Chromium	mg/kg	3.7	23.7	19.3	27.8	19.4	101	81	75-125	35	20	D6

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QUALITY CONTROL DATA

Project: Black Pine Mine REV
Pace Project No.: 10163644

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 1014840 1014841

Parameter	Units	10163643001 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Cobalt	mg/kg	4.3	23.7	19.3	26.2	18.1	92	71	75-125	36	20	
Copper	mg/kg	1110	23.7	19.3	1140	860	146	-1290	75-125	28	20	D6,E, M6
Iron	mg/kg	27600	296	241	25900	21300	-570	-2590	75-125	19	20	M6
Lead	mg/kg	2650	23.7	19.3	2410	2110	-978	-2760	75-125	13	20	E,M6
Manganese	mg/kg	315	23.7	19.3	281	249	-143	-341	75-125	12	20	M6
Nickel	mg/kg	9.3	23.7	19.3	32.8	21.8	99	65	75-125	40	20	D6,M6
Zinc	mg/kg	250	23.7	19.3	314	224	268	-136	75-125	33	20	D6,M6

MATRIX SPIKE SAMPLE: 1014842

Parameter	Units	10163644001 Result	Spike Conc.	MS Result	MS % Rec	% Rec Limits	Qualifiers
Antimony	mg/kg	15.0	19.3	18.9	20	75-125	M6
Arsenic	mg/kg	8.6	19.3	34.2	133	75-125	M6
Barium	mg/kg	237	19.3	177	-308	75-125	M6
Cadmium	mg/kg	1.4	19.3	19.4	93	75-125	
Chromium	mg/kg	3.3	19.3	21.8	96	75-125	
Cobalt	mg/kg	4.7	19.3	21.5	87	75-125	
Copper	mg/kg	139	19.3	128	-56	75-125	M6
Iron	mg/kg	6800	241	12300	2300	75-125	M6
Lead	mg/kg	15.8	19.3	52.5	191	75-125	M6
Manganese	mg/kg	1170	19.3	464	-3680	75-125	M6
Nickel	mg/kg	6.1	19.3	22.8	87	75-125	
Zinc	mg/kg	93.2	19.3	132	204	75-125	M6

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QUALITY CONTROL DATA

Project: Black Pine Mine REV
Pace Project No.: 10163644

QC Batch: MERP/5651 Analysis Method: EPA 7471
QC Batch Method: EPA 7471 Analysis Description: 7471 Mercury
Associated Lab Samples: 10163644001, 10163644002, 10163644003, 10163644004, 10163644005, 10163644006, 10163644007, 10163644008, 10163644009, 10163644010

METHOD BLANK: 1016612 Matrix: Solid
Associated Lab Samples: 10163644001, 10163644002, 10163644003, 10163644004, 10163644005, 10163644006, 10163644007, 10163644008, 10163644009, 10163644010

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Mercury	mg/kg	<0.018	0.018	08/01/11 13:16	

LABORATORY CONTROL SAMPLE: 1016613

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Mercury	mg/kg	.45	0.46	102	80-120	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 1016614 1016615

Parameter	Units	10163643010 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Mercury	mg/kg	4.1	.62	.65	3.8	3.9	-53	-36	80-120	3	20	M6

MATRIX SPIKE SAMPLE: 1016616

Parameter	Units	10163645009 Result	Spike Conc.	MS Result	MS % Rec	% Rec Limits	Qualifiers
Mercury	mg/kg	0.30	.44	0.47	39	80-120	M1

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QUALITY CONTROL DATA

Project: Black Pine Mine REV
Pace Project No.: 10163644

QC Batch: MPRP/27306 Analysis Method: % Moisture
QC Batch Method: % Moisture Analysis Description: Dry Weight/Percent Moisture
Associated Lab Samples: 10163644001, 10163644002, 10163644003, 10163644004, 10163644005, 10163644006, 10163644007, 10163644008, 10163644009, 10163644010

SAMPLE DUPLICATE: 1019478

Parameter	Units	10163643009 Result	Dup Result	RPD	Max RPD	Qualifiers
Percent Moisture	%	16.2	16.3	1	30	

SAMPLE DUPLICATE: 1019479

Parameter	Units	10163645008 Result	Dup Result	RPD	Max RPD	Qualifiers
Percent Moisture	%	37.2	40.7	9	30	

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QUALITY CONTROL DATA

Project: Black Pine Mine REV
Pace Project No.: 10163644

QC Batch: MT/6442 Analysis Method: ASA 33-3.2/EPA 353.2
QC Batch Method: ASA 33-3.2/EPA 353.2 Analysis Description: 353.2 Nitrate + Nitrite
Associated Lab Samples: 10163644006, 10163644008, 10163644010

METHOD BLANK: 1016641 Matrix: Solid
Associated Lab Samples: 10163644006, 10163644008, 10163644010

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Available Nitrate	mg/kg	<5.0	5.0	07/26/11 17:37	

LABORATORY CONTROL SAMPLE: 1016642

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Available Nitrate	mg/kg	25	24.0	96	76-124	

SAMPLE DUPLICATE: 1016643

Parameter	Units	10163246004 Result	Dup Result	RPD	Max RPD	Qualifiers
Available Nitrate	mg/kg	<5.0	<5.0		30	

SAMPLE DUPLICATE: 1016644

Parameter	Units	10163644008 Result	Dup Result	RPD	Max RPD	Qualifiers
Available Nitrate	mg/kg	<5.0	<5.0		30	

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QUALITY CONTROL DATA

Project: Black Pine Mine REV
Pace Project No.: 10163644

QC Batch: MT/6438 Analysis Method: ASA 29-3.5.2
QC Batch Method: ASA 29-3.5.2 Analysis Description: Organic Matter ASA 29
Associated Lab Samples: 10163644006, 10163644008, 10163644010

METHOD BLANK: 1016290 Matrix: Solid
Associated Lab Samples: 10163644006, 10163644008, 10163644010

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Organic Matter	% (w/w)	<0.10	0.10	07/21/11 16:50	

LABORATORY CONTROL SAMPLE: 1016291

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Organic Matter	% (w/w)	3.1	3.3	107	69-131	

SAMPLE DUPLICATE: 1016293

Parameter	Units	10163634008 Result	Dup Result	RPD	Max RPD	Qualifiers
Organic Matter	% (w/w)	0.13	<0.10		30	

SAMPLE DUPLICATE: 1018103

Parameter	Units	10163246002 Result	Dup Result	RPD	Max RPD	Qualifiers
Organic Matter	% (w/w)	3.3	3.2	2	30	

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QUALITY CONTROL DATA

Project: Black Pine Mine REV
Pace Project No.: 10163644

QC Batch: MT/6426 Analysis Method: ASA 10-3.2
QC Batch Method: ASA 10-3.2 Analysis Description: ASA 10-3.2 pH saturated paste
Associated Lab Samples: 10163644006, 10163644008, 10163644010

SAMPLE DUPLICATE: 1017424

Parameter	Units	10163246004 Result	Dup Result	RPD	Max RPD	Qualifiers
pH, Saturated Paste	Std. Units	7.0	6.9	.7	20	

SAMPLE DUPLICATE: 1017425

Parameter	Units	10163645001 Result	Dup Result	RPD	Max RPD	Qualifiers
pH, Saturated Paste	Std. Units	6.9	6.7	2	20	

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QUALITY CONTROL DATA

Project: Black Pine Mine REV
Pace Project No.: 10163644

QC Batch: MT/6443 Analysis Method: ASA 24-5.4/SM4500
QC Batch Method: ASA 24-5.4/SM4500 Analysis Description: SM4500P-E, Total Phosphorus
Associated Lab Samples: 10163644006, 10163644008, 10163644010

METHOD BLANK: 1016645 Matrix: Solid
Associated Lab Samples: 10163644006, 10163644008, 10163644010

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Available Phosphorus	mg/kg	<1.0	1.0	07/25/11 14:30	

LABORATORY CONTROL SAMPLE: 1016646

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Available Phosphorus	mg/kg	10	8.0	80	56-144	

SAMPLE DUPLICATE: 1016647

Parameter	Units	10163246004 Result	Dup Result	RPD	Max RPD	Qualifiers
Available Phosphorus	mg/kg	2.8	3.1	9	30	

SAMPLE DUPLICATE: 1016648

Parameter	Units	10163644006 Result	Dup Result	RPD	Max RPD	Qualifiers
Available Phosphorus	mg/kg	1.4	1.4	3	30	

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QUALITY CONTROL DATA

Project: Black Pine Mine REV
Pace Project No.: 10163644

QC Batch: MT/6480 Analysis Method: Modified Sobek 3.2
QC Batch Method: Modified Sobek 3.2 Analysis Description: Sobek Acid Base Potential
Associated Lab Samples: 10163644006, 10163644008, 10163644010

METHOD BLANK: 1019986 Matrix: Solid
Associated Lab Samples: 10163644006, 10163644008, 10163644010

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Neutralization Potential	tons/1000	<0.5	0.50	07/29/11 00:00	

SAMPLE DUPLICATE: 1019631

Parameter	Units	10163606002 Result	Dup Result	RPD	Max RPD	Qualifiers
Neutralization Potential	tons/1000	1.5	1.7			

SAMPLE DUPLICATE: 1019632

Parameter	Units	10163246007 Result	Dup Result	RPD	Max RPD	Qualifiers
Neutralization Potential	tons/1000	4.0	5.7			

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QUALITY CONTROL DATA

Project: Black Pine Mine REV
Pace Project No.: 10163644

QC Batch: MT/6497 Analysis Method: Modified Sobek 3.2
QC Batch Method: Modified Sobek 3.2 Analysis Description: Sobek Acid Base Potential
Associated Lab Samples: 10163644001, 10163644003, 10163644005, 10163644007, 10163644009

METHOD BLANK: 1020551 Matrix: Solid
Associated Lab Samples: 10163644001, 10163644003, 10163644005, 10163644007, 10163644009

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Neutralization Potential	tons/1000	<0.5	0.50	08/01/11 00:00	

SAMPLE DUPLICATE: 1020552

Parameter	Units	10163634001 Result	Dup Result	RPD	Max RPD	Qualifiers
Neutralization Potential	tons/1000	0.73	2.2			

SAMPLE DUPLICATE: 1024994

Parameter	Units	10163640008 Result	Dup Result	RPD	Max RPD	Qualifiers
Neutralization Potential	tons/1000	2.4	5.6			

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QUALITY CONTROL DATA

Project: Black Pine Mine REV
Pace Project No.: 10163644

QC Batch: MT/6452 Analysis Method: Modified Sobek 3.2
QC Batch Method: Modified Sobek 3.2 Analysis Description: Sobek Extractable Sulfur
Associated Lab Samples: 10163644006, 10163644008, 10163644010

METHOD BLANK: 1017262 Matrix: Solid
Associated Lab Samples: 10163644006, 10163644008, 10163644010

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Total Sulfur	% (w/w)	<0.050	0.050	07/29/11 16:11	

SAMPLE DUPLICATE: 1017264

Parameter	Units	10163606002 Result	Dup Result	RPD	Max RPD	Qualifiers
Total Sulfur	% (w/w)	0.228	0.211	8		

SAMPLE DUPLICATE: 1017265

Parameter	Units	10163246007 Result	Dup Result	RPD	Max RPD	Qualifiers
Total Sulfur	% (w/w)	<0.050	<0.050			

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QUALITY CONTROL DATA

Project: Black Pine Mine REV
Pace Project No.: 10163644

QC Batch: MT/6488 Analysis Method: Modified Sobek 3.2
QC Batch Method: Modified Sobek 3.2 Analysis Description: Sobek Extractable Sulfur
Associated Lab Samples: 10163644001, 10163644003, 10163644005, 10163644007, 10163644009

METHOD BLANK: 1019974 Matrix: Solid
Associated Lab Samples: 10163644001, 10163644003, 10163644005, 10163644007, 10163644009

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Total Sulfur	% (w/w)	<0.050	0.050	08/08/11 14:36	

SAMPLE DUPLICATE: 1019976

Parameter	Units	10163634001 Result	Dup Result	RPD	Max RPD	Qualifiers
Total Sulfur	% (w/w)	<0.050	<0.050			

SAMPLE DUPLICATE: 1019977

Parameter	Units	10163643005 Result	Dup Result	RPD	Max RPD	Qualifiers
Total Sulfur	% (w/w)	0.0605	0.0697	14		

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QUALITY CONTROL DATA

Project: Black Pine Mine REV
Pace Project No.: 10163644

QC Batch: MT/6481 Analysis Method: Modified Sobek 3.2
QC Batch Method: Modified Sobek 3.2 Analysis Description: Sobek SMP Buffer pH
Associated Lab Samples: 10163644006, 10163644008, 10163644010

LABORATORY CONTROL SAMPLE: 1019634

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
SMP Buffer pH	Std. Units		7.0			

SAMPLE DUPLICATE: 1019635

Parameter	Units	10163606002 Result	Dup Result	RPD	Max RPD	Qualifiers
SMP Buffer pH	Std. Units	6.6	6.6	0	20	

SAMPLE DUPLICATE: 1019636

Parameter	Units	10163246007 Result	Dup Result	RPD	Max RPD	Qualifiers
SMP Buffer pH	Std. Units	6.8	6.8	.7	20	

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QUALITY CONTROL DATA

Project: Black Pine Mine REV
Pace Project No.: 10163644

QC Batch: MT/6543 Analysis Method: Modified Sobek 3.2
QC Batch Method: Modified Sobek 3.2 Analysis Description: Sobek SMP Buffer pH
Associated Lab Samples: 10163644001, 10163644003, 10163644005, 10163644007, 10163644009

SAMPLE DUPLICATE: 1022818

Parameter	Units	10163634001 Result	Dup Result	RPD	Max RPD	Qualifiers
SMP Buffer pH	Std. Units	7.3	7.2	.3	20	

SAMPLE DUPLICATE: 1026468

Parameter	Units	10163643005 Result	Dup Result	RPD	Max RPD	Qualifiers
SMP Buffer pH	Std. Units	7.1	7.1	.3	20	

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QUALITY CONTROL DATA

Project: Black Pine Mine REV
Pace Project No.: 10163644

QC Batch: MT/6547 Analysis Method: ASA 10-3.3
QC Batch Method: ASA 10-3.3 Analysis Description: ASA 10-3.3 Specific Conductance
Associated Lab Samples: 10163644008, 10163644010

METHOD BLANK: 1022940 Matrix: Water
Associated Lab Samples: 10163644008, 10163644010

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Sp.Conductance Saturated Paste	mmhos/cm	<0.010	0.010	07/27/11 12:56	

LABORATORY CONTROL SAMPLE: 1022941

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Sp.Conductance Saturated Paste	mmhos/cm	.85	0.80	94	53-147	

SAMPLE DUPLICATE: 1022942

Parameter	Units	10163246004 Result	Dup Result	RPD	Max RPD	Qualifiers
Sp.Conductance Saturated Paste	mmhos/cm	0.091	0.088	3	20	

SAMPLE DUPLICATE: 1022943

Parameter	Units	10163645001 Result	Dup Result	RPD	Max RPD	Qualifiers
Sp.Conductance Saturated Paste	mmhos/cm	0.20	0.14	33	20	D6

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QUALITY CONTROL DATA

Project: Black Pine Mine REV
Pace Project No.: 10163644

QC Batch: MT/6575
QC Batch Method: ASA 10-3.3
Analysis Method: ASA 10-3.3
Analysis Description: ASA 10-3.3 Specific Conductance
Associated Lab Samples: 10163644006

METHOD BLANK: 1025145
Matrix: Water
Associated Lab Samples: 10163644006

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Sp.Conductance Saturated Paste	mmhos/cm	<0.010	0.010	08/03/11 19:49	

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QUALIFIERS

Project: Black Pine Mine REV
Pace Project No.: 10163644

DEFINITIONS

DF - Dilution Factor, if reported, represents the factor applied to the reported data due to changes in sample preparation, dilution of the sample aliquot, or moisture content.

ND - Not Detected at or above adjusted reporting limit.

J - Estimated concentration above the adjusted method detection limit and below the adjusted reporting limit.

MDL - Adjusted Method Detection Limit.

S - Surrogate

1,2-Diphenylhydrazine (8270 listed analyte) decomposes to Azobenzene.

Consistent with EPA guidelines, unrounded data are displayed and have been used to calculate % recovery and RPD values.

LCS(D) - Laboratory Control Sample (Duplicate)

MS(D) - Matrix Spike (Duplicate)

DUP - Sample Duplicate

RPD - Relative Percent Difference

NC - Not Calculable.

SG - Silica Gel - Clean-Up

U - Indicates the compound was analyzed for, but not detected.

N-Nitrosodiphenylamine decomposes and cannot be separated from Diphenylamine using Method 8270. The result reported for each analyte is a combined concentration.

LABORATORIES

PASI-K	Pace Analytical Services - Kansas City
PASI-M	Pace Analytical Services - Minneapolis
PASI-MT	Pace Analytical Services - Montana

ANALYTE QUALIFIERS

D6	The relative percent difference (RPD) between the sample and sample duplicate exceeded laboratory control limits.
E	Analyte concentration exceeded the calibration range. The reported result is estimated.
M1	Matrix spike recovery exceeded QC limits. Batch accepted based on laboratory control sample (LCS) recovery.
M6	Matrix spike and Matrix spike duplicate recovery not evaluated against control limits due to sample dilution.

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QUALITY CONTROL DATA CROSS REFERENCE TABLE

Project: Black Pine Mine REV
Pace Project No.: 10163644

Lab ID	Sample ID	QC Batch Method	QC Batch	Analytical Method	Analytical Batch
10163644006	**BP-CMN-SS-13-04**	ASA 13-3.5.2.2	MPRP/27469	CLPICPAES	ICP/11638
10163644008	**BP-CMN-SS-12-04**	ASA 13-3.5.2.2	MPRP/27469	CLPICPAES	ICP/11638
10163644010	**BP-CMN-SS-11-04**	ASA 13-3.5.2.2	MPRP/27469	CLPICPAES	ICP/11638
10163644006	**BP-CMN-SS-13-04**	EPA 9081	ICP/14917	EPA 9081	ICP/13002
10163644008	**BP-CMN-SS-12-04**	EPA 9081	ICP/14917	EPA 9081	ICP/13002
10163644010	**BP-CMN-SS-11-04**	EPA 9081	ICP/14917	EPA 9081	ICP/13002
10163644001	**BP-CMN-SS-10-00**	EPA 3050	MPRP/27164	EPA 6020	ICPM/11124
10163644002	**BP-CMN-SS-10-04**	EPA 3050	MPRP/27164	EPA 6020	ICPM/11124
10163644003	**BP-CMN-SS-14-00**	EPA 3050	MPRP/27164	EPA 6020	ICPM/11124
10163644004	**BP-CMN-SS-14-04**	EPA 3050	MPRP/27164	EPA 6020	ICPM/11124
10163644005	**BP-CMN-SS-13-00**	EPA 3050	MPRP/27164	EPA 6020	ICPM/11124
10163644006	**BP-CMN-SS-13-04**	EPA 3050	MPRP/27164	EPA 6020	ICPM/11124
10163644007	**BP-CMN-SS-12-00**	EPA 3050	MPRP/27164	EPA 6020	ICPM/11124
10163644008	**BP-CMN-SS-12-04**	EPA 3050	MPRP/27164	EPA 6020	ICPM/11124
10163644009	**BP-CMN-SS-11-00**	EPA 3050	MPRP/27164	EPA 6020	ICPM/11124
10163644010	**BP-CMN-SS-11-04**	EPA 3050	MPRP/27164	EPA 6020	ICPM/11124
10163644001	**BP-CMN-SS-10-00**	EPA 7471	MERP/5651	EPA 7471	MERC/6471
10163644002	**BP-CMN-SS-10-04**	EPA 7471	MERP/5651	EPA 7471	MERC/6471
10163644003	**BP-CMN-SS-14-00**	EPA 7471	MERP/5651	EPA 7471	MERC/6471
10163644004	**BP-CMN-SS-14-04**	EPA 7471	MERP/5651	EPA 7471	MERC/6471
10163644005	**BP-CMN-SS-13-00**	EPA 7471	MERP/5651	EPA 7471	MERC/6471
10163644006	**BP-CMN-SS-13-04**	EPA 7471	MERP/5651	EPA 7471	MERC/6471
10163644007	**BP-CMN-SS-12-00**	EPA 7471	MERP/5651	EPA 7471	MERC/6471
10163644008	**BP-CMN-SS-12-04**	EPA 7471	MERP/5651	EPA 7471	MERC/6471
10163644009	**BP-CMN-SS-11-00**	EPA 7471	MERP/5651	EPA 7471	MERC/6471
10163644010	**BP-CMN-SS-11-04**	EPA 7471	MERP/5651	EPA 7471	MERC/6471
10163644001	**BP-CMN-SS-10-00**	% Moisture	MPRP/27306		
10163644002	**BP-CMN-SS-10-04**	% Moisture	MPRP/27306		
10163644003	**BP-CMN-SS-14-00**	% Moisture	MPRP/27306		
10163644004	**BP-CMN-SS-14-04**	% Moisture	MPRP/27306		
10163644005	**BP-CMN-SS-13-00**	% Moisture	MPRP/27306		
10163644006	**BP-CMN-SS-13-04**	% Moisture	MPRP/27306		
10163644007	**BP-CMN-SS-12-00**	% Moisture	MPRP/27306		
10163644008	**BP-CMN-SS-12-04**	% Moisture	MPRP/27306		
10163644009	**BP-CMN-SS-11-00**	% Moisture	MPRP/27306		
10163644010	**BP-CMN-SS-11-04**	% Moisture	MPRP/27306		
10163644006	**BP-CMN-SS-13-04**	ASA 33-3.2/EPA 353.2	MT/6442		
10163644008	**BP-CMN-SS-12-04**	ASA 33-3.2/EPA 353.2	MT/6442		
10163644010	**BP-CMN-SS-11-04**	ASA 33-3.2/EPA 353.2	MT/6442		
10163644006	**BP-CMN-SS-13-04**	ASTM D421	MT/6412		
10163644008	**BP-CMN-SS-12-04**	ASTM D421	MT/6412		
10163644010	**BP-CMN-SS-11-04**	ASTM D421	MT/6412		
10163644006	**BP-CMN-SS-13-04**	ASA 29-3.5.2	MT/6438		
10163644008	**BP-CMN-SS-12-04**	ASA 29-3.5.2	MT/6438		
10163644010	**BP-CMN-SS-11-04**	ASA 29-3.5.2	MT/6438		

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QUALITY CONTROL DATA CROSS REFERENCE TABLE

Project: Black Pine Mine REV
Pace Project No.: 10163644

Lab ID	Sample ID	QC Batch Method	QC Batch	Analytical Method	Analytical Batch
10163644006	**BP-CMN-SS-13-04**	ASA 10-3.2	MT/6426		
10163644008	**BP-CMN-SS-12-04**	ASA 10-3.2	MT/6426		
10163644010	**BP-CMN-SS-11-04**	ASA 10-3.2	MT/6426		
10163644006	**BP-CMN-SS-13-04**	ASA 24-5.4/SM4500	MT/6443		
10163644008	**BP-CMN-SS-12-04**	ASA 24-5.4/SM4500	MT/6443		
10163644010	**BP-CMN-SS-11-04**	ASA 24-5.4/SM4500	MT/6443		
10163644001	**BP-CMN-SS-10-00**	Modified Sobek 3.2	MT/6497		
10163644003	**BP-CMN-SS-14-00**	Modified Sobek 3.2	MT/6497		
10163644005	**BP-CMN-SS-13-00**	Modified Sobek 3.2	MT/6497		
10163644006	**BP-CMN-SS-13-04**	Modified Sobek 3.2	MT/6480		
10163644007	**BP-CMN-SS-12-00**	Modified Sobek 3.2	MT/6497		
10163644008	**BP-CMN-SS-12-04**	Modified Sobek 3.2	MT/6480		
10163644009	**BP-CMN-SS-11-00**	Modified Sobek 3.2	MT/6497		
10163644010	**BP-CMN-SS-11-04**	Modified Sobek 3.2	MT/6480		
10163644001	**BP-CMN-SS-10-00**	Modified Sobek 3.2	MT/6488		
10163644003	**BP-CMN-SS-14-00**	Modified Sobek 3.2	MT/6488		
10163644005	**BP-CMN-SS-13-00**	Modified Sobek 3.2	MT/6488		
10163644006	**BP-CMN-SS-13-04**	Modified Sobek 3.2	MT/6452		
10163644007	**BP-CMN-SS-12-00**	Modified Sobek 3.2	MT/6488		
10163644008	**BP-CMN-SS-12-04**	Modified Sobek 3.2	MT/6452		
10163644009	**BP-CMN-SS-11-00**	Modified Sobek 3.2	MT/6488		
10163644010	**BP-CMN-SS-11-04**	Modified Sobek 3.2	MT/6452		
10163644001	**BP-CMN-SS-10-00**	Modified Sobek 3.2	MT/6501		
10163644003	**BP-CMN-SS-14-00**	Modified Sobek 3.2	MT/6501		
10163644005	**BP-CMN-SS-13-00**	Modified Sobek 3.2	MT/6501		
10163644006	**BP-CMN-SS-13-04**	Modified Sobek 3.2	MT/6499		
10163644007	**BP-CMN-SS-12-00**	Modified Sobek 3.2	MT/6501		
10163644008	**BP-CMN-SS-12-04**	Modified Sobek 3.2	MT/6499		
10163644009	**BP-CMN-SS-11-00**	Modified Sobek 3.2	MT/6501		
10163644010	**BP-CMN-SS-11-04**	Modified Sobek 3.2	MT/6499		
10163644001	**BP-CMN-SS-10-00**	Modified Sobek 3.2	MT/6543		
10163644003	**BP-CMN-SS-14-00**	Modified Sobek 3.2	MT/6543		
10163644005	**BP-CMN-SS-13-00**	Modified Sobek 3.2	MT/6543		
10163644006	**BP-CMN-SS-13-04**	Modified Sobek 3.2	MT/6481		
10163644007	**BP-CMN-SS-12-00**	Modified Sobek 3.2	MT/6543		
10163644008	**BP-CMN-SS-12-04**	Modified Sobek 3.2	MT/6481		
10163644009	**BP-CMN-SS-11-00**	Modified Sobek 3.2	MT/6543		

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QUALITY CONTROL DATA CROSS REFERENCE TABLE

Project: Black Pine Mine REV
Pace Project No.: 10163644

Lab ID	Sample ID	QC Batch Method	QC Batch	Analytical Method	Analytical Batch
10163644010	**BP-CMN-SS-11-04**	Modified Sobek 3.2	MT/6481		
10163644006	**BP-CMN-SS-13-04**	ASA 10-3.3	MT/6575		
10163644008	**BP-CMN-SS-12-04**	ASA 10-3.3	MT/6547		
10163644010	**BP-CMN-SS-11-04**	ASA 10-3.3	MT/6547		

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CHAIN-OF-CUSTODY / Analytical Request Document

The Chain-of-Custody is a LEGAL DOCUMENT. All relevant fields must be completed accurately.

Page: 1 of 1

1429910

Section A Required Client Information:	Section B Required Project Information:	Section C Invoice Information:
Company: HERRERA	Report To: KEVIN HUCK	Attention:
Address:	Copy To:	Company Name:
		Address:
Email To:	Purchase Order No.:	Pace Quote Reference:
Phone: Fax:	Project Name:	Pace Project Manager:
Requested Due Date/TAT:	Project Number:	Pace Profile #:

REGULATORY AGENCY

☐ NPDES ☐ GROUND WATER ☐ DRINKING WATER

☐ UST ☐ RCRA ☐ OTHER _____

Site Location STATE: _____

Requested Analysis Filtered (Y/N)

ITEM #	Section D Required Client Information — SAMPLE ID (A-Z, 0-9 / ,-) Sample IDs MUST BE UNIQUE	Matrix Codes MATRIX / CODE: Drinking Water DW, Water WT, Waste Water WW, Product P, Soil/Solid SL, Oil OL, Wipe WP, Air AR, Tissue TS, Other OT	MATRIX CODE (see valid codes to left)	SAMPLE TYPE (G=GRAB C=COMP)	COLLECTED: COMPOSITE START DATE	COMPOSITE START TIME	COMPOSITE END/GRAB DATE	COMPOSITE END/GRAB TIME	SAMPLE TEMP AT COLLECTION	# OF CONTAINERS	Preservatives: Unpreserved	H_2SO_4	HNO_3	HCl	NaOH	$Na_2S_2O_3$	Methanol	Other	Analysis Test Y/N	TOTAL RECOVERABLE METALS	ABA	AGRICULTURE	Residual Chlorine (Y/N)	Pace Project No./ Lab I.D.
																							10163644
1	BP-CMN-55-10-00	SL					7/14/11	1455		2	X									X	X			001
2	BP-CMN-55-10-04	SL					7/14/11	1500		1	X									X				002
3	BP-CMN-55-14-00	SL					7/14/11	1515		2	X									X	X			003
4	BP-CMN-55-14-04	SL					7/14/11	1520		1	X									X				004
5	BP-CMN-55-13-00	SL					7/14/11	1550		2	X									X	X			005
6	BP-CMN-55-13-04	SL					7/14/11	1555		2	X									X		X		006
7	BP-CMN-55-12-00	SL					7/14/11	1615		2	X									X	X			007
8	BP-CMN-55-12-04	SL					7/14/11	1620		2	X									X		X		008
9	BP-CMN-55-11-00	SL					7/14/11	1640		2	X									X	X			009
10	BP-CMN-55-11-04	SL					7/14/11	1645		2	X									X		X		010
11																								
12																								

ADDITIONAL COMMENTS	RELINQUISHED BY / AFFILIATION	DATE	TIME	ACCEPTED BY / AFFILIATION	DATE	TIME	SAMPLE CONDITIONS			
	FedEx Rvpickup (E)	7/16/11	1131	[signature] Pace	7/16/11	1130	3°	Y	Y	Y

ORIGINAL

SAMPLER NAME AND SIGNATURE

PRINT Name of SAMPLER: ALEX SVENDSEN

SIGNATURE of SAMPLER: [signature] DATE Signed (MM/DD/YY): 7/15/11

Temp in °C	Received on Ice (Y/N)	Custody Sealed Cooler (Y/N)	Samples Intact (Y/N)

*Important Note: By signing this form you are accepting Pace's NET 30 day payment terms and agreeing to late charges of 1.5% per month for any invoices not paid within 30 days.

Sample Condition Upon Receipt

Pace Analytical

Client Name: MDEQ - BLACK PINE Project # 10163644

Courier: [X] Fed Ex [ ] UPS [ ] USPS [ ] Client [ ] Commercial [ ] Pace Other _____

Tracking #: 876249308789

Custody Seal on Cooler/Box Present: [X] yes [ ] no Seals intact: [X] yes [ ] no

Packing Material: [ ] Bubble Wrap [X] Bubble Bags [ ] None [ ] Other _____ Temp Blank: Yes [X] No [ ]

Thermometer Used 383045 or 135 Type of Ice: (Wet) Blue None [X] Samples on ice, cooling process has begun

Cooler Temperature 3.0° Biological Tissue is Frozen: Yes No

Temp should be above freezing to 6°C

Comments:

Date and Initials of person examining contents: NCT 7/17/11

Chain of Custody Present:	[X] Yes [ ] No [ ] N/A	1.
Chain of Custody Filled Out:	[X] Yes [ ] No [ ] N/A	2.
Chain of Custody Relinquished:	[X] Yes [ ] No [ ] N/A	3.
Sampler Name & Signature on COC:	[X] Yes [ ] No [ ] N/A	4.
Samples Arrived within Hold Time:	[X] Yes [ ] No [ ] N/A	5.
Short Hold Time Analysis (<72hr):	[ ] Yes [X] No [ ] N/A	6.
Rush Turn Around Time Requested:	[ ] Yes [X] No [ ] N/A	7.
Sufficient Volume:	[X] Yes [ ] No [ ] N/A	8.
Correct Containers Used:	[X] Yes [ ] No [ ] N/A	9.
-Pace Containers Used:	[X] Yes [ ] No [ ] N/A	
Containers Intact:	[X] Yes [ ] No [ ] N/A	10.
Filtered volume received for Dissolved tests	[ ] Yes [ ] No [X] N/A	11.
Sample Labels match COC:	[X] Yes [ ] No [ ] N/A	12.
-Includes date/time/ID/Analysis Matrix: SOIL		
All containers needing acid/base preservation have been checked. Noncompliance are noted in 13.	[ ] Yes [ ] No [X] N/A	13. [ ] HNO3 [ ] H2SO4 [ ] NaOH [ ] HCl Samp #
All containers needing preservation are found to be in compliance with EPA recommendation.	[ ] Yes [ ] No [X] N/A	
Exceptions: VOA,Coliform, TOC, Oil and Grease, WI-DRO (water)	[ ] Yes [X] No	Initial when completed / Lot # of added preservative
Samples checked for dechlorination:	[ ] Yes [ ] No [X] N/A	14.
Headspace in VOA Vials (>6mm):	[ ] Yes [ ] No [X] N/A	15.
Trip Blank Present:	[ ] Yes [ ] No [X] N/A	16.
Trip Blank Custody Seals Present	[ ] Yes [ ] No [X] N/A	
Pace Trip Blank Lot # (if purchased):		

Client Notification/ Resolution: Field Data Required? Y / N

Person Contacted: _____ Date/Time: _____

Comments/ Resolution: _____

Project Manager Review: [signature] **Date:** 7/18/11

Note: Whenever there is a discrepancy affecting North Carolina compliance samples, a copy of this form will be sent to the North Carolina DEHNR Certification Office (i.e out of hold, incorrect preservative, out of temp, incorrect containers)

Pace Analytical Services, Inc.
602 S 25th Street
Billings, MT 591014549
(406)254-7226

October 18, 2011

Kevin Houck
Herrera Environmental Consultants
101 East Broadway, Suite 610
Missoula, MT 59802

RE: Project: Black Pine Mine REV
Pace Project No.: 10163645

Dear Kevin Houck:
Enclosed are the analytical results for sample(s) received by the laboratory on July 16, 2011. The results relate only to the samples included in this report.

This report has been revised to add Cobalt and delete Silver.

If you have any questions concerning this report, please feel free to contact me.

Sincerely,

Shawn Davis for
Sally Heinje
sally.heinje@pacelabs.com
Project Manager

Enclosures

cc: Devin Clary, Montana Dept. of Environmental Quality
Mark Donner, Trihydro
Jamie Mongoven, Montana Dept. of Environmental

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Pace Analytical Services, Inc.
602 S 25th Street
Billings, MT 591014549
(406)254-7226

CERTIFICATIONS

Project: Black Pine Mine REV
Pace Project No.: 10163645

Minnesota Certification IDs

1700 Elm Street SE Suite 200, Minneapolis, MN 55414
A2LA Certification #: 2926.01
Alaska Certification #: UST-078
Alaska Certification #MN00064
Arizona Certification #: AZ-0014
Arkansas Certification #: 88-0680
California Certification #: 01155CA
EPA Region 8 Certification #: Pace
Florida/NELAP Certification #: E87605
Georgia Certification #: 959
Idaho Certification #: MN00064
Illinois Certification #: 200011
Iowa Certification #: 368
Kansas Certification #: E-10167
Louisiana Certification #: 03086
Louisiana Certification #: LA080009
Maine Certification #: 2007029
Maryland Certification #: 322
Michigan DEQ Certification #: 9909
Minnesota Certification #: 027-053-137
Mississippi Certification #: Pace
Montana Certification #: MT CERT0092
Nebraska Certification #: Pace
Nevada Certification #: MN_00064
New Jersey Certification #: MN-002
New Mexico Certification #: Pace
New York Certification #: 11647
North Carolina Certification #: 530
North Dakota Certification #: R-036
North Dakota Certification #: R-036A
Ohio VAP Certification #: CL101
Oklahoma Certification #: D9921
Oklahoma Certification #: 9507
Oregon Certification #: MN200001
Pennsylvania Certification #: 68-00563
Puerto Rico Certification
Tennessee Certification #: 02818
Texas Certification #: T104704192
Washington Certification #: C754
Wisconsin Certification #: 999407970

Montana Certification IDs

602 South 25th Street, Billings, MT 59101
EPA Region 8 Certification #: 8TMS-Q
Idaho Certification #: MT00012
Montana Certification #: MT CERT0040
NVLAP Certification #: 101292-0
Minnesota Dept of Health Certification #: 030-999-442

Kansas Certification IDs

9608 Loiret Boulevard, Lenexa, KS 66219
A2LA Certification #: 2456.01
Arkansas Certification #: 05-008-0
Illinois Certification #: 001191
Iowa Certification #: 118
Kansas/NELAP Certification #: E-10116
Louisiana Certification #: 03055
Nevada Certification #: KS000212008A
Oklahoma Certification #: 9205/9935
Texas Certification #: T104704407-08-TX
Utah Certification #: 9135995665

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SAMPLE SUMMARY

Project: Black Pine Mine REV
Pace Project No.: 10163645

Lab ID	Sample ID	Matrix	Date Collected	Date Received
10163645001	**BP-CML-TS-11-01**	Solid	07/15/11 07:35	07/16/11 11:30
10163645002	**BP-CML-TS-11-08**	Solid	07/15/11 07:40	07/16/11 11:30
10163645003	**BP-CML-TS-10-00**	Solid	07/15/11 08:50	07/16/11 11:30
10163645004	**BP-CML-TS-10-02**	Solid	07/15/11 08:52	07/16/11 11:30
10163645005	**BP-CML-SS-10-06**	Solid	07/15/11 08:54	07/16/11 11:30
10163645006	**BP-CML-TS-01-00**	Solid	07/15/11 09:40	07/16/11 11:30
10163645007	**BP-CML-TS-01-02**	Solid	07/15/11 09:42	07/16/11 11:30
10163645008	**BP-CML-SS-01-06**	Solid	07/15/11 09:45	07/16/11 11:30
10163645009	**BP-CML-TS-02-00**	Solid	07/15/11 10:10	07/16/11 11:30
10163645010	**BP-CML-TS-02-02**	Solid	07/15/11 10:15	07/16/11 11:30
10163645011	**BP-CML-SS-02-06**	Solid	07/15/11 10:17	07/16/11 11:30
10163645012	**BP-CML-TS-03-00**	Solid	07/15/11 10:40	07/16/11 11:30
10163645013	**BP-CML-TS-03-02**	Solid	07/15/11 10:43	07/16/11 11:30
10163645014	**BP-CML-SS-03-06**	Solid	07/15/11 10:45	07/16/11 11:30

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SAMPLE ANALYTE COUNT

Project: Black Pine Mine REV
Pace Project No.: 10163645

Lab ID	Sample ID	Method	Analysts	Analytes Reported	Laboratory
10163645001	**BP-CML-TS-11-01**	CLPICPAES	IP	1	PASI-M
		EPA 9081	SMW	1	PASI-K
		EPA 6020	TL1	12	PASI-M
		EPA 7471	TEM	1	PASI-M
		% Moisture	JDL	1	PASI-M
		ASA 33-3.2/EPA 353.2	CAC	1	PASI-MT
		ASTM D421	CAC	1	PASI-MT
		ASA 29-3.5.2	CAC	1	PASI-MT
		ASA 10-3.2	CAC	1	PASI-MT
		ASA 24-5.4/SM4500	SA1	1	PASI-MT
		Modified Sobek 3.2	JH1	1	PASI-MT
		Modified Sobek 3.2	JH1	5	PASI-MT
		Modified Sobek 3.2	JH1	4	PASI-MT
		Modified Sobek 3.2	JH1	1	PASI-MT
		ASA 10-3.3	SR1	1	PASI-MT
10163645002	**BP-CML-TS-11-08**	CLPICPAES	IP	1	PASI-M
		EPA 9081	SMW	1	PASI-K
		EPA 6020	TL1	12	PASI-M
		EPA 7471	TEM	1	PASI-M
		% Moisture	JDL	1	PASI-M
		ASA 33-3.2/EPA 353.2	CAC	1	PASI-MT
		ASTM D421	CAC	1	PASI-MT
		ASA 29-3.5.2	CAC	1	PASI-MT
		ASA 10-3.2	CAC	1	PASI-MT
		ASA 24-5.4/SM4500	SA1	1	PASI-MT
		Modified Sobek 3.2	JH1	1	PASI-MT
		Modified Sobek 3.2	JH1	5	PASI-MT
		Modified Sobek 3.2	JH1	4	PASI-MT
		Modified Sobek 3.2	JH1	1	PASI-MT
		ASA 10-3.3	SR1	1	PASI-MT
10163645003	**BP-CML-TS-10-00**	EPA 6020	TL1	12	PASI-M
		EPA 7471	TEM	1	PASI-M
		% Moisture	JDL	1	PASI-M
		Modified Sobek 3.2	JH1	1	PASI-MT
		Modified Sobek 3.2	JH1	5	PASI-MT
		Modified Sobek 3.2	JH1	4	PASI-MT
		Modified Sobek 3.2	JH1	1	PASI-MT

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SAMPLE ANALYTE COUNT

Project: Black Pine Mine REV
Pace Project No.: 10163645

Lab ID	Sample ID	Method	Analysts	Analytes Reported	Laboratory
10163645004	**BP-CML-TS-10-02**	EPA 6020	TL1	12	PASI-M
		EPA 7471	TEM	1	PASI-M
		% Moisture	JDL	1	PASI-M
10163645005	**BP-CML-SS-10-06**	EPA 6020	TL1	12	PASI-M
		EPA 7471	TEM	1	PASI-M
		% Moisture	JDL	1	PASI-M
10163645006	**BP-CML-TS-01-00**	EPA 6020	TL1	12	PASI-M
		EPA 7471	TEM	1	PASI-M
		% Moisture	JDL	1	PASI-M
10163645007	**BP-CML-TS-01-02**	EPA 6020	TL1	12	PASI-M
		EPA 7471	TEM	1	PASI-M
		% Moisture	JDL	1	PASI-M
		Modified Sobek 3.2	JH1	1	PASI-MT
		Modified Sobek 3.2	JH1	5	PASI-MT
		Modified Sobek 3.2	JH1	4	PASI-MT
		Modified Sobek 3.2	JH1	1	PASI-MT
10163645008	**BP-CML-SS-01-06**	EPA 6020	TL1	12	PASI-M
		EPA 7471	TEM	1	PASI-M
		% Moisture	JDL	1	PASI-M
10163645009	**BP-CML-TS-02-00**	EPA 6020	TL1	12	PASI-M
		EPA 7471	TEM	1	PASI-M
		% Moisture	JDL	1	PASI-M
10163645010	**BP-CML-TS-02-02**	EPA 6020	TL1	12	PASI-M
		EPA 7471	TEM	1	PASI-M
		% Moisture	JDL	1	PASI-M
		Modified Sobek 3.2	JH1	1	PASI-MT
		Modified Sobek 3.2	JH1	5	PASI-MT
		Modified Sobek 3.2	JH1	4	PASI-MT
		Modified Sobek 3.2	JH1	1	PASI-MT
10163645011	**BP-CML-SS-02-06**	EPA 6020	TL1	12	PASI-M
		EPA 7471	TEM	1	PASI-M
		% Moisture	JDL	1	PASI-M
10163645012	**BP-CML-TS-03-00**	EPA 6020	TL1	12	PASI-M
		EPA 7471	TEM	1	PASI-M
		% Moisture	JDL	1	PASI-M
10163645013	**BP-CML-TS-03-02**	EPA 6020	TL1	12	PASI-M
		EPA 7471	TEM	1	PASI-M

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SAMPLE ANALYTE COUNT

Project: Black Pine Mine REV
Pace Project No.: 10163645

Lab ID	Sample ID	Method	Analysts	Analytes Reported	Laboratory
		% Moisture	JDL	1	PASI-M
		Modified Sobek 3.2	JH1	1	PASI-MT
		Modified Sobek 3.2	JH1	5	PASI-MT
		Modified Sobek 3.2	JH1	4	PASI-MT
		Modified Sobek 3.2	JH1	1	PASI-MT
10163645014	**BP-CML-SS-03-06**	EPA 6020	TL1	12	PASI-M
		EPA 7471	TEM	1	PASI-M
		% Moisture	JDL	1	PASI-M

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PROJECT NARRATIVE

Project: Black Pine Mine REV
Pace Project No.: 10163645

Method: **CLPICPAES**
Description: 6010 MET ICP, MDEQ Potassium
Client: Montana Dept. of Environmental Quality
Date: October 18, 2011

General Information:
2 samples were analyzed for CLPICPAES. All samples were received in acceptable condition with any exceptions noted below.

Hold Time:
The samples were analyzed within the method required hold times with any exceptions noted below.

Sample Preparation:
The samples were prepared in accordance with ASA 13-3.5.2.2 with any exceptions noted below.

Initial Calibrations (including MS Tune as applicable):
All criteria were within method requirements with any exceptions noted below.

Continuing Calibration:
All criteria were within method requirements with any exceptions noted below.

Method Blank:
All analytes were below the report limit in the method blank with any exceptions noted below.

Laboratory Control Spike:
All laboratory control spike compounds were within QC limits with any exceptions noted below.

Matrix Spikes:
All percent recoveries and relative percent differences (RPDs) were within acceptance criteria with any exceptions noted below.

Duplicate Sample:
All duplicate sample results were within method acceptance criteria with any exceptions noted below.

Additional Comments:

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PROJECT NARRATIVE

Project: Black Pine Mine REV
Pace Project No.: 10163645

Method: **EPA 9081**
Description: Cation Exchange Capacity
Client: Montana Dept. of Environmental Quality
Date: October 18, 2011

General Information:
2 samples were analyzed for EPA 9081. All samples were received in acceptable condition with any exceptions noted below.

Hold Time:
The samples were analyzed within the method required hold times with any exceptions noted below.

Initial Calibrations (including MS Tune as applicable):
All criteria were within method requirements with any exceptions noted below.

Continuing Calibration:
All criteria were within method requirements with any exceptions noted below.

Method Blank:
All analytes were below the report limit in the method blank with any exceptions noted below.

Laboratory Control Spike:
All laboratory control spike compounds were within QC limits with any exceptions noted below.

Matrix Spikes:
All percent recoveries and relative percent differences (RPDs) were within acceptance criteria with any exceptions noted below.

Duplicate Sample:
All duplicate sample results were within method acceptance criteria with any exceptions noted below.

Additional Comments:

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PROJECT NARRATIVE

Project: Black Pine Mine REV
Pace Project No.: 10163645

Method: **EPA 6020**
Description: 6020 MET ICPMS
Client: Montana Dept. of Environmental Quality
Date: October 18, 2011

General Information:
14 samples were analyzed for EPA 6020. All samples were received in acceptable condition with any exceptions noted below.

Hold Time:
The samples were analyzed within the method required hold times with any exceptions noted below.

Sample Preparation:
The samples were prepared in accordance with EPA 3050 with any exceptions noted below.

Initial Calibrations (including MS Tune as applicable):
All criteria were within method requirements with any exceptions noted below.

Continuing Calibration:
All criteria were within method requirements with any exceptions noted below.

Internal Standards:
All internal standards were within QC limits with any exceptions noted below.

Method Blank:
All analytes were below the report limit in the method blank with any exceptions noted below.

Laboratory Control Spike:
All laboratory control spike compounds were within QC limits with any exceptions noted below.

Matrix Spikes:
All percent recoveries and relative percent differences (RPDs) were within acceptance criteria with any exceptions noted below.

QC Batch: MPRP/27165

A matrix spike and matrix spike duplicate (MS/MSD) were performed on the following sample(s): 10163645001,10163645011

M6: Matrix spike and Matrix spike duplicate recovery not evaluated against control limits due to sample dilution.

- MS (Lab ID: 1014845)
  - Barium
  - Iron
  - Manganese
- MS (Lab ID: 1014847)
  - Antimony
  - Barium
  - Chromium
  - Copper
  - Iron
  - Lead
  - Manganese
  - Zinc
- MSD (Lab ID: 1014846)

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PROJECT NARRATIVE

Project: Black Pine Mine REV
Pace Project No.: 10163645

Method: **EPA 6020**
Description: 6020 MET ICPMS
Client: Montana Dept. of Environmental Quality
Date: October 18, 2011

QC Batch: MPRP/27165

A matrix spike and matrix spike duplicate (MS/MSD) were performed on the following sample(s): 10163645001,10163645011

M6: Matrix spike and Matrix spike duplicate recovery not evaluated against control limits due to sample dilution.

- Antimony
- Barium
- Iron
- Manganese

Duplicate Sample:
All duplicate sample results were within method acceptance criteria with any exceptions noted below.

Additional Comments:

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PROJECT NARRATIVE

Project: Black Pine Mine REV
Pace Project No.: 10163645

Method: **EPA 7471**
Description: 7471 Mercury
Client: Montana Dept. of Environmental Quality
Date: October 18, 2011

General Information:
14 samples were analyzed for EPA 7471. All samples were received in acceptable condition with any exceptions noted below.

Hold Time:
The samples were analyzed within the method required hold times with any exceptions noted below.

Sample Preparation:
The samples were prepared in accordance with EPA 7471 with any exceptions noted below.

Initial Calibrations (including MS Tune as applicable):
All criteria were within method requirements with any exceptions noted below.

Continuing Calibration:
All criteria were within method requirements with any exceptions noted below.

Method Blank:
All analytes were below the report limit in the method blank with any exceptions noted below.

Laboratory Control Spike:
All laboratory control spike compounds were within QC limits with any exceptions noted below.

Matrix Spikes:
All percent recoveries and relative percent differences (RPDs) were within acceptance criteria with any exceptions noted below.

QC Batch: MERP/5651

A matrix spike and matrix spike duplicate (MS/MSD) were performed on the following sample(s): 10163643010,10163645009

M1: Matrix spike recovery exceeded QC limits. Batch accepted based on laboratory control sample (LCS) recovery.

- MS (Lab ID: 1016616)
  - Mercury

M6: Matrix spike and Matrix spike duplicate recovery not evaluated against control limits due to sample dilution.

- MS (Lab ID: 1016614)
  - Mercury
- MSD (Lab ID: 1016615)
  - Mercury

Duplicate Sample:
All duplicate sample results were within method acceptance criteria with any exceptions noted below.

Additional Comments:

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PROJECT NARRATIVE

Project: Black Pine Mine REV
Pace Project No.: 10163645

Method: **ASA 33-3.2/EPA 353.2**
Description: 353.2 Nitrate + Nitrite pres.
Client: Montana Dept. of Environmental Quality
Date: October 18, 2011

General Information:
2 samples were analyzed for ASA 33-3.2/EPA 353.2. All samples were received in acceptable condition with any exceptions noted below.

Hold Time:
The samples were analyzed within the method required hold times with any exceptions noted below.

Initial Calibrations (including MS Tune as applicable):
All criteria were within method requirements with any exceptions noted below.

Continuing Calibration:
All criteria were within method requirements with any exceptions noted below.

Internal Standards:
All internal standards were within QC limits with any exceptions noted below.

Surrogates:
All surrogates were within QC limits with any exceptions noted below.

Method Blank:
All analytes were below the report limit in the method blank with any exceptions noted below.

Laboratory Control Spike:
All laboratory control spike compounds were within QC limits with any exceptions noted below.

Matrix Spikes:
All percent recoveries and relative percent differences (RPDs) were within acceptance criteria with any exceptions noted below.

Duplicate Sample:
All duplicate sample results were within method acceptance criteria with any exceptions noted below.

Additional Comments:

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PROJECT NARRATIVE

Project: Black Pine Mine REV
Pace Project No.: 10163645

Method: **ASTM D421**
Description: Coarse
Client: Montana Dept. of Environmental Quality
Date: October 18, 2011

General Information:
2 samples were analyzed for ASTM D421. All samples were received in acceptable condition with any exceptions noted below.

Hold Time:
The samples were analyzed within the method required hold times with any exceptions noted below.

Initial Calibrations (including MS Tune as applicable):
All criteria were within method requirements with any exceptions noted below.

Continuing Calibration:
All criteria were within method requirements with any exceptions noted below.

Internal Standards:
All internal standards were within QC limits with any exceptions noted below.

Surrogates:
All surrogates were within QC limits with any exceptions noted below.

Method Blank:
All analytes were below the report limit in the method blank with any exceptions noted below.

Laboratory Control Spike:
All laboratory control spike compounds were within QC limits with any exceptions noted below.

Matrix Spikes:
All percent recoveries and relative percent differences (RPDs) were within acceptance criteria with any exceptions noted below.

Duplicate Sample:
All duplicate sample results were within method acceptance criteria with any exceptions noted below.

Additional Comments:

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PROJECT NARRATIVE

Project: Black Pine Mine REV
Pace Project No.: 10163645

Method: **ASA 29-3.5.2**
Description: Organic Matter MT ASA 29
Client: Montana Dept. of Environmental Quality
Date: October 18, 2011

General Information:
2 samples were analyzed for ASA 29-3.5.2. All samples were received in acceptable condition with any exceptions noted below.

Hold Time:
The samples were analyzed within the method required hold times with any exceptions noted below.

Initial Calibrations (including MS Tune as applicable):
All criteria were within method requirements with any exceptions noted below.

Continuing Calibration:
All criteria were within method requirements with any exceptions noted below.

Internal Standards:
All internal standards were within QC limits with any exceptions noted below.

Surrogates:
All surrogates were within QC limits with any exceptions noted below.

Method Blank:
All analytes were below the report limit in the method blank with any exceptions noted below.

Laboratory Control Spike:
All laboratory control spike compounds were within QC limits with any exceptions noted below.

Matrix Spikes:
All percent recoveries and relative percent differences (RPDs) were within acceptance criteria with any exceptions noted below.

Duplicate Sample:
All duplicate sample results were within method acceptance criteria with any exceptions noted below.

Additional Comments:

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PROJECT NARRATIVE

Project: Black Pine Mine REV
Pace Project No.: 10163645

Method: **ASA 10-3.2**
Description: ASA 10-3.2 pH
Client: Montana Dept. of Environmental Quality
Date: October 18, 2011

General Information:
2 samples were analyzed for ASA 10-3.2. All samples were received in acceptable condition with any exceptions noted below.

Hold Time:
The samples were analyzed within the method required hold times with any exceptions noted below.

Initial Calibrations (including MS Tune as applicable):
All criteria were within method requirements with any exceptions noted below.

Continuing Calibration:
All criteria were within method requirements with any exceptions noted below.

Internal Standards:
All internal standards were within QC limits with any exceptions noted below.

Surrogates:
All surrogates were within QC limits with any exceptions noted below.

Method Blank:
All analytes were below the report limit in the method blank with any exceptions noted below.

Laboratory Control Spike:
All laboratory control spike compounds were within QC limits with any exceptions noted below.

Matrix Spikes:
All percent recoveries and relative percent differences (RPDs) were within acceptance criteria with any exceptions noted below.

Duplicate Sample:
All duplicate sample results were within method acceptance criteria with any exceptions noted below.

Additional Comments:

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PROJECT NARRATIVE

Project: Black Pine Mine REV
Pace Project No.: 10163645

Method: **ASA 24-5.4/SM4500**
Description: SM4500P-E, Total Phosphorus
Client: Montana Dept. of Environmental Quality
Date: October 18, 2011

General Information:
2 samples were analyzed for ASA 24-5.4/SM4500. All samples were received in acceptable condition with any exceptions noted below.

Hold Time:
The samples were analyzed within the method required hold times with any exceptions noted below.

Initial Calibrations (including MS Tune as applicable):
All criteria were within method requirements with any exceptions noted below.

Continuing Calibration:
All criteria were within method requirements with any exceptions noted below.

Internal Standards:
All internal standards were within QC limits with any exceptions noted below.

Surrogates:
All surrogates were within QC limits with any exceptions noted below.

Method Blank:
All analytes were below the report limit in the method blank with any exceptions noted below.

Laboratory Control Spike:
All laboratory control spike compounds were within QC limits with any exceptions noted below.

Matrix Spikes:
All percent recoveries and relative percent differences (RPDs) were within acceptance criteria with any exceptions noted below.

Duplicate Sample:
All duplicate sample results were within method acceptance criteria with any exceptions noted below.

Additional Comments:

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PROJECT NARRATIVE

Project: Black Pine Mine REV
Pace Project No.: 10163645

Method: **Modified Sobek 3.2**
Description: Sobek Acid Base Potential
Client: Montana Dept. of Environmental Quality
Date: October 18, 2011

General Information:
6 samples were analyzed for Modified Sobek 3.2. All samples were received in acceptable condition with any exceptions noted below.

Hold Time:
The samples were analyzed within the method required hold times with any exceptions noted below.

Initial Calibrations (including MS Tune as applicable):
All criteria were within method requirements with any exceptions noted below.

Continuing Calibration:
All criteria were within method requirements with any exceptions noted below.

Internal Standards:
All internal standards were within QC limits with any exceptions noted below.

Surrogates:
All surrogates were within QC limits with any exceptions noted below.

Method Blank:
All analytes were below the report limit in the method blank with any exceptions noted below.

Laboratory Control Spike:
All laboratory control spike compounds were within QC limits with any exceptions noted below.

Matrix Spikes:
All percent recoveries and relative percent differences (RPDs) were within acceptance criteria with any exceptions noted below.

Duplicate Sample:
All duplicate sample results were within method acceptance criteria with any exceptions noted below.

Additional Comments:

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PROJECT NARRATIVE

Project: Black Pine Mine REV
Pace Project No.: 10163645

Method: **Modified Sobek 3.2**
Description: Sobek Extractable Sulfur
Client: Montana Dept. of Environmental Quality
Date: October 18, 2011

General Information:
6 samples were analyzed for Modified Sobek 3.2. All samples were received in acceptable condition with any exceptions noted below.

Hold Time:
The samples were analyzed within the method required hold times with any exceptions noted below.

Initial Calibrations (including MS Tune as applicable):
All criteria were within method requirements with any exceptions noted below.

Continuing Calibration:
All criteria were within method requirements with any exceptions noted below.

Internal Standards:
All internal standards were within QC limits with any exceptions noted below.

Surrogates:
All surrogates were within QC limits with any exceptions noted below.

Method Blank:
All analytes were below the report limit in the method blank with any exceptions noted below.

Laboratory Control Spike:
All laboratory control spike compounds were within QC limits with any exceptions noted below.

Matrix Spikes:
All percent recoveries and relative percent differences (RPDs) were within acceptance criteria with any exceptions noted below.

Duplicate Sample:
All duplicate sample results were within method acceptance criteria with any exceptions noted below.

Additional Comments:

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PROJECT NARRATIVE

Project: Black Pine Mine REV
Pace Project No.: 10163645

Method: **Modified Sobek 3.2**
Description: Sobek Calculations
Client: Montana Dept. of Environmental Quality
Date: October 18, 2011

General Information:
6 samples were analyzed for Modified Sobek 3.2. All samples were received in acceptable condition with any exceptions noted below.

Hold Time:
The samples were analyzed within the method required hold times with any exceptions noted below.

Initial Calibrations (including MS Tune as applicable):
All criteria were within method requirements with any exceptions noted below.

Continuing Calibration:
All criteria were within method requirements with any exceptions noted below.

Internal Standards:
All internal standards were within QC limits with any exceptions noted below.

Surrogates:
All surrogates were within QC limits with any exceptions noted below.

Method Blank:
All analytes were below the report limit in the method blank with any exceptions noted below.

Laboratory Control Spike:
All laboratory control spike compounds were within QC limits with any exceptions noted below.

Matrix Spikes:
All percent recoveries and relative percent differences (RPDs) were within acceptance criteria with any exceptions noted below.

Duplicate Sample:
All duplicate sample results were within method acceptance criteria with any exceptions noted below.

Additional Comments:

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PROJECT NARRATIVE

Project: Black Pine Mine REV
Pace Project No.: 10163645

Method: **Modified Sobek 3.2**
Description: Sobek SMP Buffer pH
Client: Montana Dept. of Environmental Quality
Date: October 18, 2011

General Information:
6 samples were analyzed for Modified Sobek 3.2. All samples were received in acceptable condition with any exceptions noted below.

Hold Time:
The samples were analyzed within the method required hold times with any exceptions noted below.

Initial Calibrations (including MS Tune as applicable):
All criteria were within method requirements with any exceptions noted below.

Continuing Calibration:
All criteria were within method requirements with any exceptions noted below.

Internal Standards:
All internal standards were within QC limits with any exceptions noted below.

Surrogates:
All surrogates were within QC limits with any exceptions noted below.

Method Blank:
All analytes were below the report limit in the method blank with any exceptions noted below.

Laboratory Control Spike:
All laboratory control spike compounds were within QC limits with any exceptions noted below.

Matrix Spikes:
All percent recoveries and relative percent differences (RPDs) were within acceptance criteria with any exceptions noted below.

Duplicate Sample:
All duplicate sample results were within method acceptance criteria with any exceptions noted below.

Additional Comments:

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PROJECT NARRATIVE

Project: Black Pine Mine REV
Pace Project No.: 10163645

Method: **ASA 10-3.3**
Description: ASA10-3.3 Specific Conductance
Client: Montana Dept. of Environmental Quality
Date: October 18, 2011

General Information:
2 samples were analyzed for ASA 10-3.3. All samples were received in acceptable condition with any exceptions noted below.

Hold Time:
The samples were analyzed within the method required hold times with any exceptions noted below.

Initial Calibrations (including MS Tune as applicable):
All criteria were within method requirements with any exceptions noted below.

Continuing Calibration:
All criteria were within method requirements with any exceptions noted below.

Internal Standards:
All internal standards were within QC limits with any exceptions noted below.

Surrogates:
All surrogates were within QC limits with any exceptions noted below.

Method Blank:
All analytes were below the report limit in the method blank with any exceptions noted below.

Laboratory Control Spike:
All laboratory control spike compounds were within QC limits with any exceptions noted below.

Matrix Spikes:
All percent recoveries and relative percent differences (RPDs) were within acceptance criteria with any exceptions noted below.

Duplicate Sample:
All duplicate sample results were within method acceptance criteria with any exceptions noted below.

QC Batch: MT/6547

D6: The relative percent difference (RPD) between the sample and sample duplicate exceeded laboratory control limits.

- DUP (Lab ID: 1022943)
  - Sp.Conductance Saturated Paste

Additional Comments:

This data package has been reviewed for quality and completeness and is approved for release.

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ANALYTICAL RESULTS

Project: Black Pine Mine REV
Pace Project No.: 10163645

Sample: BP-CML-TS-11-01 **Lab ID: 10163645001** Collected: 07/15/11 07:35 Received: 07/16/11 11:30 Matrix: Solid

Results reported on a "dry-weight" basis

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
6010 MET ICP, MDEQ Potassium	Analytical Method: CLPICPAES Preparation Method: ASA 13-3.5.2.2							
Potassium	**<120**	mg/kg	120	5	08/01/11 17:34	08/01/11 19:34	7440-09-7	
Cation Exchange Capacity	Analytical Method: EPA 9081							
Cation Exchange Capacity	**14.7**	meq/100g	0.98	10	08/03/11 14:00	08/05/11 13:31		
6020 MET ICPMS	Analytical Method: EPA 6020 Preparation Method: EPA 3050							
Antimony	**0.63**	mg/kg	0.49	20	07/25/11 07:59	07/28/11 01:22	7440-36-0	M6
Arsenic	**6.1**	mg/kg	0.49	20	07/25/11 07:59	07/28/11 01:22	7440-38-2	
Barium	**116**	mg/kg	0.29	20	07/25/11 07:59	07/28/11 01:22	7440-39-3	M6
Cadmium	**0.079**	mg/kg	0.078	20	07/25/11 07:59	07/28/11 01:22	7440-43-9	
Chromium	**10.9**	mg/kg	0.49	20	07/25/11 07:59	07/28/11 01:22	7440-47-3	
Cobalt	**3.3**	mg/kg	0.49	20	07/25/11 07:59	07/28/11 01:22	7440-48-4	
Copper	**9.6**	mg/kg	0.49	20	07/25/11 07:59	07/28/11 01:22	7440-50-8	
Iron	**19300**	mg/kg	48.6	20	07/25/11 07:59	07/28/11 01:22	7439-89-6	M6
Lead	**12.1**	mg/kg	0.097	20	07/25/11 07:59	07/28/11 01:22	7439-92-1	
Manganese	**224**	mg/kg	0.49	20	07/25/11 07:59	07/28/11 01:22	7439-96-5	M6
Nickel	**6.0**	mg/kg	0.49	20	07/25/11 07:59	07/28/11 01:22	7440-02-0	
Zinc	**22.8**	mg/kg	4.9	20	07/25/11 07:59	07/28/11 01:22	7440-66-6	
7471 Mercury	Analytical Method: EPA 7471 Preparation Method: EPA 7471							
Mercury	**0.023**	mg/kg	0.022	1	07/22/11 14:31	08/01/11 14:15	7439-97-6	
Dry Weight	Analytical Method: % Moisture							
Percent Moisture	**9.7**	%	0.10	1		07/25/11 00:00		
353.2 Nitrate + Nitrite pres.	Analytical Method: ASA 33-3.2/EPA 353.2							
Available Nitrate	**<5.0**	mg/kg	5.0	1		07/26/11 18:21		
Coarse	Analytical Method: ASTM D421							
Coarse Fragment	**21.9**	% (w/w)	0.10	1		07/26/11 12:15		
Organic Matter MT ASA 29	Analytical Method: ASA 29-3.5.2							
Organic Matter	**0.81**	% (w/w)	0.10	1		07/21/11 16:50		
ASA 10-3.2 pH	Analytical Method: ASA 10-3.2							
pH, Saturated Paste	**6.9**	Std. Units	0.10	1		07/27/11 17:42		
SM4500P-E, Total Phosphorus	Analytical Method: ASA 24-5.4/SM4500							
Available Phosphorus	**<1.0**	mg/kg	1.0	1		07/25/11 14:52	7723-14-0	
Sobek Acid Base Potential	Analytical Method: Modified Sobek 3.2							
Neutralization Potential	**2.0**	tons/1000	0.50	1		08/02/11 00:00		

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ANALYTICAL RESULTS

Project: Black Pine Mine REV
Pace Project No.: 10163645

Sample: BP-CML-TS-11-01 **Lab ID: 10163645001** Collected: 07/15/11 07:35 Received: 07/16/11 11:30 Matrix: Solid

Results reported on a "dry-weight" basis

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
Sobek Extractable Sulfur	Analytical Method: Modified Sobek 3.2							
Sulfur, HCl Extractable	**<0.050**	% (w/w)	0.050	1		08/09/11 11:16		
Sulfur, HNO3 Extractable	**<0.050**	% (w/w)	0.050	1		08/09/11 11:16		
Sulfur, Hot Water Extractable	**<0.050**	% (w/w)	0.050	1		08/09/11 11:16		
Sulfur, Residual	**<0.050**	% (w/w)	0.050	1		08/09/11 11:16		
Total Sulfur	**<0.050**	% (w/w)	0.050	1		08/09/11 11:16		
Sobek Calculations	Analytical Method: Modified Sobek 3.2							
Acid/Base Potential	**1.8**	tons/1000		1		08/02/11 00:00		
Acid Potential	**0.20**	tons/1000	4.3	1		08/02/11 00:00		
Lime Requirement	**1.5**	tons/1000	5.4	1		08/02/11 00:00		
SMP Lime Requirement	**1.0**	tons/1000	0.0	1		08/02/11 00:00		
Sobek SMP Buffer pH	Analytical Method: Modified Sobek 3.2							
SMP Buffer pH	**6.8**	Std. Units	0.10	1		07/29/11 14:34		
ASA10-3.3 Specific Conductance	Analytical Method: ASA 10-3.3							
Sp.Conductance Saturated Paste	**0.20**	mmhos/cm	0.010	1		07/27/11 12:56		

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ANALYTICAL RESULTS

Project: Black Pine Mine REV
Pace Project No.: 10163645

Sample: BP-CML-TS-11-08 **Lab ID: 10163645002** Collected: 07/15/11 07:40 Received: 07/16/11 11:30 Matrix: Solid

Results reported on a "dry-weight" basis

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
6010 MET ICP, MDEQ Potassium	Analytical Method: CLPICPAES Preparation Method: ASA 13-3.5.2.2							
Potassium	**<118**	mg/kg	118	5	08/01/11 17:34	08/01/11 19:38	7440-09-7	
Cation Exchange Capacity	Analytical Method: EPA 9081							
Cation Exchange Capacity	**30.3**	meq/100g	1.0	10	08/03/11 14:00	08/05/11 13:44		
6020 MET ICPMS	Analytical Method: EPA 6020 Preparation Method: EPA 3050							
Antimony	**0.49**	mg/kg	0.46	20	07/25/11 07:59	07/28/11 01:29	7440-36-0	
Arsenic	**6.2**	mg/kg	0.46	20	07/25/11 07:59	07/28/11 01:29	7440-38-2	
Barium	**109**	mg/kg	0.28	20	07/25/11 07:59	07/28/11 01:29	7440-39-3	
Cadmium	**0.15**	mg/kg	0.074	20	07/25/11 07:59	07/28/11 01:29	7440-43-9	
Chromium	**16.7**	mg/kg	0.46	20	07/25/11 07:59	07/28/11 01:29	7440-47-3	
Cobalt	**7.4**	mg/kg	0.46	20	07/25/11 07:59	07/28/11 01:29	7440-48-4	
Copper	**11.0**	mg/kg	0.46	20	07/25/11 07:59	07/28/11 01:29	7440-50-8	
Iron	**28300**	mg/kg	231	100	07/25/11 07:59	07/28/11 01:32	7439-89-6	
Lead	**12.0**	mg/kg	0.092	20	07/25/11 07:59	07/28/11 01:29	7439-92-1	
Manganese	**374**	mg/kg	0.46	20	07/25/11 07:59	07/28/11 01:29	7439-96-5	
Nickel	**8.7**	mg/kg	0.46	20	07/25/11 07:59	07/28/11 01:29	7440-02-0	
Zinc	**54.7**	mg/kg	4.6	20	07/25/11 07:59	07/28/11 01:29	7440-66-6	
7471 Mercury	Analytical Method: EPA 7471 Preparation Method: EPA 7471							
Mercury	**6.8**	mg/kg	0.24	10	07/22/11 14:31	08/01/11 14:27	7439-97-6	
Dry Weight	Analytical Method: % Moisture							
Percent Moisture	**12.5**	%	0.10	1		07/25/11 00:00		
353.2 Nitrate + Nitrite pres.	Analytical Method: ASA 33-3.2/EPA 353.2							
Available Nitrate	**<5.0**	mg/kg	5.0	1		07/26/11 18:23		
Coarse	Analytical Method: ASTM D421							
Coarse Fragment	**34.4**	% (w/w)	0.10	1		07/26/11 12:15		
Organic Matter MT ASA 29	Analytical Method: ASA 29-3.5.2							
Organic Matter	**<0.10**	% (w/w)	0.10	1		07/21/11 16:50		
ASA 10-3.2 pH	Analytical Method: ASA 10-3.2							
pH, Saturated Paste	**6.7**	Std. Units	0.10	1		07/27/11 17:44		
SM4500P-E, Total Phosphorus	Analytical Method: ASA 24-5.4/SM4500							
Available Phosphorus	**<1.0**	mg/kg	1.0	1		07/25/11 14:52	7723-14-0	
Sobek Acid Base Potential	Analytical Method: Modified Sobek 3.2							
Neutralization Potential	**4.4**	tons/1000	0.50	1		08/02/11 00:00		

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ANALYTICAL RESULTS

Project: Black Pine Mine REV
Pace Project No.: 10163645

Sample: BP-CML-TS-11-08 **Lab ID: 10163645002** Collected: 07/15/11 07:40 Received: 07/16/11 11:30 Matrix: Solid

Results reported on a "dry-weight" basis

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
Sobek Extractable Sulfur	Analytical Method: Modified Sobek 3.2							
Sulfur, HCl Extractable	**<0.050**	% (w/w)	0.050	1		08/09/11 11:45		
Sulfur, HNO3 Extractable	**<0.050**	% (w/w)	0.050	1		08/09/11 11:45		
Sulfur, Hot Water Extractable	**<0.050**	% (w/w)	0.050	1		08/09/11 11:45		
Sulfur, Residual	**<0.050**	% (w/w)	0.050	1		08/09/11 11:45		
Total Sulfur	**<0.050**	% (w/w)	0.050	1		08/09/11 11:45		
Sobek Calculations	Analytical Method: Modified Sobek 3.2							
Acid/Base Potential	**4.4**	tons/1000		1		08/02/11 00:00		
Acid Potential	**<4.3**	tons/1000	4.3	1		08/02/11 00:00		
Lime Requirement	**<5.4**	tons/1000	5.4	1		08/02/11 00:00		
SMP Lime Requirement	**1.0**	tons/1000	0.0	1		08/02/11 00:00		
Sobek SMP Buffer pH	Analytical Method: Modified Sobek 3.2							
SMP Buffer pH	**6.8**	Std. Units	0.10	1		07/29/11 14:34		
ASA10-3.3 Specific Conductance	Analytical Method: ASA 10-3.3							
Sp.Conductance Saturated Paste	**0.17**	mmhos/cm	0.010	1		07/27/11 12:56		

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ANALYTICAL RESULTS

Project: Black Pine Mine REV
Pace Project No.: 10163645

Sample: BP-CML-TS-10-00 **Lab ID: 10163645003** Collected: 07/15/11 08:50 Received: 07/16/11 11:30 Matrix: Solid

Results reported on a "dry-weight" basis

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
6020 MET ICPMS	Analytical Method: EPA 6020 Preparation Method: EPA 3050							
Antimony	**1090**	mg/kg	2.5	100	07/25/11 07:59	07/28/11 01:39	7440-36-0	
Arsenic	**1250**	mg/kg	2.5	100	07/25/11 07:59	07/28/11 01:39	7440-38-2	
Barium	**378**	mg/kg	0.30	20	07/25/11 07:59	07/28/11 01:36	7440-39-3	
Cadmium	**5.8**	mg/kg	0.080	20	07/25/11 07:59	07/28/11 01:36	7440-43-9	
Chromium	**<0.50**	mg/kg	0.50	20	07/25/11 07:59	07/28/11 01:36	7440-47-3	
Cobalt	**0.98**	mg/kg	0.50	20	07/25/11 07:59	07/28/11 01:36	7440-48-4	
Copper	**2160**	mg/kg	10.1	400	07/25/11 07:59	07/29/11 09:42	7440-50-8	
Iron	**42900**	mg/kg	251	100	07/25/11 07:59	07/28/11 01:39	7439-89-6	
Lead	**8010**	mg/kg	2.0	400	07/25/11 07:59	07/29/11 09:42	7439-92-1	
Manganese	**254**	mg/kg	0.50	20	07/25/11 07:59	07/28/11 01:36	7439-96-5	
Nickel	**1.8**	mg/kg	0.50	20	07/25/11 07:59	07/28/11 01:36	7440-02-0	
Zinc	**989**	mg/kg	25.1	100	07/25/11 07:59	07/28/11 01:39	7440-66-6	
7471 Mercury	Analytical Method: EPA 7471 Preparation Method: EPA 7471							
Mercury	**0.33**	mg/kg	0.021	1	07/22/11 14:31	08/01/11 14:34	7439-97-6	
Dry Weight	Analytical Method: % Moisture							
Percent Moisture	**12.0**	%	0.10	1		07/25/11 00:00		
Sobek Acid Base Potential	Analytical Method: Modified Sobek 3.2							
Neutralization Potential	**<0.5**	tons/1000	0.50	1		08/02/11 00:00		
Sobek Extractable Sulfur	Analytical Method: Modified Sobek 3.2							
Sulfur, HCl Extractable	**0.0825**	% (w/w)	0.050	1		08/09/11 11:57		
Sulfur, HNO3 Extractable	**<0.050**	% (w/w)	0.050	1		08/09/11 11:57		
Sulfur, Hot Water Extractable	**0.144**	% (w/w)	0.050	1		08/09/11 11:57		
Sulfur, Residual	**<0.050**	% (w/w)	0.050	1		08/09/11 11:57		
Total Sulfur	**0.227**	% (w/w)	0.050	1		08/09/11 11:57		
Sobek Calculations	Analytical Method: Modified Sobek 3.2							
Acid/Base Potential	**0**	tons/1000		1		08/02/11 00:00		
Acid Potential	**<4.3**	tons/1000	4.3	1		08/02/11 00:00		
Lime Requirement	**<5.4**	tons/1000	5.4	1		08/02/11 00:00		
SMP Lime Requirement	**0.30**	tons/1000	0.0	1		08/02/11 00:00		
Sobek SMP Buffer pH	Analytical Method: Modified Sobek 3.2							
SMP Buffer pH	**6.9**	Std. Units	0.10	1		07/29/11 14:34		

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ANALYTICAL RESULTS

Project: Black Pine Mine REV
Pace Project No.: 10163645

Sample: BP-CML-TS-10-02 **Lab ID: 10163645004** Collected: 07/15/11 08:52 Received: 07/16/11 11:30 Matrix: Solid

Results reported on a "dry-weight" basis

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
6020 MET ICPMS	Analytical Method: EPA 6020 Preparation Method: EPA 3050							
Antimony	**1110**	mg/kg	2.4	100	07/25/11 07:59	07/28/11 02:08	7440-36-0	
Arsenic	**1400**	mg/kg	2.4	100	07/25/11 07:59	07/28/11 02:08	7440-38-2	
Barium	**616**	mg/kg	1.4	100	07/25/11 07:59	07/28/11 02:08	7440-39-3	
Cadmium	**4.4**	mg/kg	0.077	20	07/25/11 07:59	07/28/11 02:04	7440-43-9	
Chromium	**<0.48**	mg/kg	0.48	20	07/25/11 07:59	07/28/11 02:04	7440-47-3	
Cobalt	**<0.48**	mg/kg	0.48	20	07/25/11 07:59	07/28/11 02:04	7440-48-4	
Copper	**1340**	mg/kg	2.4	100	07/25/11 07:59	07/28/11 02:08	7440-50-8	
Iron	**21600**	mg/kg	47.9	20	07/25/11 07:59	07/28/11 02:04	7439-89-6	
Lead	**2490**	mg/kg	0.96	200	07/25/11 07:59	07/29/11 09:45	7439-92-1	
Manganese	**169**	mg/kg	0.48	20	07/25/11 07:59	07/28/11 02:04	7439-96-5	
Nickel	**<0.48**	mg/kg	0.48	20	07/25/11 07:59	07/28/11 02:04	7440-02-0	
Zinc	**419**	mg/kg	4.8	20	07/25/11 07:59	07/28/11 02:04	7440-66-6	
7471 Mercury	Analytical Method: EPA 7471 Preparation Method: EPA 7471							
Mercury	**0.59**	mg/kg	0.024	1	07/22/11 14:31	08/01/11 14:42	7439-97-6	
Dry Weight	Analytical Method: % Moisture							
Percent Moisture	**25.0**	%	0.10	1		07/25/11 00:00		

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ANALYTICAL RESULTS

Project: Black Pine Mine REV
Pace Project No.: 10163645

Sample: BP-CML-SS-10-06 **Lab ID: 10163645005** Collected: 07/15/11 08:54 Received: 07/16/11 11:30 Matrix: Solid

Results reported on a "dry-weight" basis

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
6020 MET ICPMS	Analytical Method: EPA 6020 Preparation Method: EPA 3050							
Antimony	**162**	mg/kg	0.45	20	07/25/11 07:59	07/28/11 02:11	7440-36-0	
Arsenic	**173**	mg/kg	0.45	20	07/25/11 07:59	07/28/11 02:11	7440-38-2	
Barium	**178**	mg/kg	0.27	20	07/25/11 07:59	07/28/11 02:11	7440-39-3	
Cadmium	**1.7**	mg/kg	0.072	20	07/25/11 07:59	07/28/11 02:11	7440-43-9	
Chromium	**<0.45**	mg/kg	0.45	20	07/25/11 07:59	07/28/11 02:11	7440-47-3	
Cobalt	**14.7**	mg/kg	0.45	20	07/25/11 07:59	07/28/11 02:11	7440-48-4	
Copper	**606**	mg/kg	2.2	100	07/25/11 07:59	07/28/11 02:15	7440-50-8	
Iron	**49500**	mg/kg	224	100	07/25/11 07:59	07/28/11 02:15	7439-89-6	
Lead	**1830**	mg/kg	0.45	100	07/25/11 07:59	07/28/11 02:15	7439-92-1	
Manganese	**1050**	mg/kg	2.2	100	07/25/11 07:59	07/28/11 02:15	7439-96-5	
Nickel	**7.9**	mg/kg	0.45	20	07/25/11 07:59	07/28/11 02:11	7440-02-0	
Zinc	**251**	mg/kg	4.5	20	07/25/11 07:59	07/28/11 02:11	7440-66-6	
7471 Mercury	Analytical Method: EPA 7471 Preparation Method: EPA 7471							
Mercury	**0.77**	mg/kg	0.023	1	07/22/11 14:31	08/01/11 15:01	7439-97-6	
Dry Weight	Analytical Method: % Moisture							
Percent Moisture	**17.2**	%	0.10	1		07/25/11 00:00		

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ANALYTICAL RESULTS

Project: Black Pine Mine REV
Pace Project No.: 10163645

Sample: BP-CML-TS-01-00 **Lab ID: 10163645006** Collected: 07/15/11 09:40 Received: 07/16/11 11:30 Matrix: Solid

Results reported on a "dry-weight" basis

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
6020 MET ICPMS	Analytical Method: EPA 6020 Preparation Method: EPA 3050							
Antimony	**324**	mg/kg	0.51	20	07/25/11 07:59	07/28/11 02:18	7440-36-0	
Arsenic	**262**	mg/kg	0.51	20	07/25/11 07:59	07/28/11 02:18	7440-38-2	
Barium	**240**	mg/kg	0.31	20	07/25/11 07:59	07/28/11 02:18	7440-39-3	
Cadmium	**8.9**	mg/kg	0.082	20	07/25/11 07:59	07/28/11 02:18	7440-43-9	
Chromium	**3.3**	mg/kg	0.51	20	07/25/11 07:59	07/28/11 02:18	7440-47-3	
Cobalt	**7.6**	mg/kg	0.51	20	07/25/11 07:59	07/28/11 02:18	7440-48-4	
Copper	**1680**	mg/kg	2.6	100	07/25/11 07:59	07/28/11 02:22	7440-50-8	
Iron	**16900**	mg/kg	51.4	20	07/25/11 07:59	07/28/11 02:18	7439-89-6	
Lead	**2300**	mg/kg	0.51	100	07/25/11 07:59	07/28/11 02:22	7439-92-1	
Manganese	**620**	mg/kg	2.6	100	07/25/11 07:59	07/28/11 02:22	7439-96-5	
Nickel	**5.7**	mg/kg	0.51	20	07/25/11 07:59	07/28/11 02:18	7440-02-0	
Zinc	**198**	mg/kg	5.1	20	07/25/11 07:59	07/28/11 02:18	7440-66-6	
7471 Mercury	Analytical Method: EPA 7471 Preparation Method: EPA 7471							
Mercury	**0.24**	mg/kg	0.022	1	07/22/11 14:31	08/01/11 15:03	7439-97-6	
Dry Weight	Analytical Method: % Moisture							
Percent Moisture	**10.7**	%	0.10	1		07/25/11 00:00		

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ANALYTICAL RESULTS

Project: Black Pine Mine REV
Pace Project No.: 10163645

Sample: BP-CML-TS-01-02 **Lab ID: 10163645007** Collected: 07/15/11 09:42 Received: 07/16/11 11:30 Matrix: Solid

Results reported on a "dry-weight" basis

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
6020 MET ICPMS	Analytical Method: EPA 6020 Preparation Method: EPA 3050							
Antimony	**23.3**	mg/kg	0.79	20	07/25/11 07:59	07/28/11 02:25	7440-36-0	
Arsenic	**24.2**	mg/kg	0.79	20	07/25/11 07:59	07/28/11 02:25	7440-38-2	
Barium	**483**	mg/kg	0.47	20	07/25/11 07:59	07/28/11 02:25	7440-39-3	
Cadmium	**8.7**	mg/kg	0.13	20	07/25/11 07:59	07/28/11 02:25	7440-43-9	
Chromium	**15.0**	mg/kg	0.79	20	07/25/11 07:59	07/28/11 02:25	7440-47-3	
Cobalt	**8.0**	mg/kg	0.79	20	07/25/11 07:59	07/28/11 02:25	7440-48-4	
Copper	**2140**	mg/kg	3.9	100	07/25/11 07:59	07/28/11 02:29	7440-50-8	
Iron	**13300**	mg/kg	78.8	20	07/25/11 07:59	07/28/11 02:25	7439-89-6	
Lead	**144**	mg/kg	0.16	20	07/25/11 07:59	07/28/11 02:25	7439-92-1	
Manganese	**269**	mg/kg	0.79	20	07/25/11 07:59	07/28/11 02:25	7439-96-5	
Nickel	**13.3**	mg/kg	0.79	20	07/25/11 07:59	07/28/11 02:25	7440-02-0	
Zinc	**213**	mg/kg	7.9	20	07/25/11 07:59	07/28/11 02:25	7440-66-6	
7471 Mercury	Analytical Method: EPA 7471 Preparation Method: EPA 7471							
Mercury	**1.0**	mg/kg	0.026	1	07/22/11 14:31	08/01/11 15:05	7439-97-6	
Dry Weight	Analytical Method: % Moisture							
Percent Moisture	**40.1**	%	0.10	1		07/25/11 00:00		
Sobek Acid Base Potential	Analytical Method: Modified Sobek 3.2							
Neutralization Potential	**2.2**	tons/1000	0.50	1		08/02/11 00:00		
Sobek Extractable Sulfur	Analytical Method: Modified Sobek 3.2							
Sulfur, HCl Extractable	**<0.050**	% (w/w)	0.050	1		08/09/11 12:29		
Sulfur, HNO3 Extractable	**<0.050**	% (w/w)	0.050	1		08/09/11 12:29		
Sulfur, Hot Water Extractable	**<0.050**	% (w/w)	0.050	1		08/09/11 12:29		
Sulfur, Residual	**<0.050**	% (w/w)	0.050	1		08/09/11 12:29		
Total Sulfur	**<0.050**	% (w/w)	0.050	1		08/09/11 12:29		
Sobek Calculations	Analytical Method: Modified Sobek 3.2							
Acid/Base Potential	**2.2**	tons/1000		1		08/02/11 00:00		
Acid Potential	**<4.3**	tons/1000	4.3	1		08/02/11 00:00		
Lime Requirement	**8.1**	tons/1000	5.4	1		08/02/11 00:00		
SMP Lime Requirement	**5.9**	tons/1000	0.0	1		08/02/11 00:00		
Sobek SMP Buffer pH	Analytical Method: Modified Sobek 3.2							
SMP Buffer pH	**5.9**	Std. Units	0.10	1		07/29/11 14:34		

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ANALYTICAL RESULTS

Project: Black Pine Mine REV
Pace Project No.: 10163645

Sample: BP-CML-SS-01-06 **Lab ID: 10163645008** Collected: 07/15/11 09:45 Received: 07/16/11 11:30 Matrix: Solid

Results reported on a "dry-weight" basis

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
6020 MET ICPMS	Analytical Method: EPA 6020 Preparation Method: EPA 3050							
Antimony	**167**	mg/kg	0.61	20	07/25/11 07:59	07/28/11 02:32	7440-36-0	
Arsenic	**123**	mg/kg	0.61	20	07/25/11 07:59	07/28/11 02:32	7440-38-2	
Barium	**229**	mg/kg	0.37	20	07/25/11 07:59	07/28/11 02:32	7440-39-3	
Cadmium	**8.3**	mg/kg	0.098	20	07/25/11 07:59	07/28/11 02:32	7440-43-9	
Chromium	**5.7**	mg/kg	0.61	20	07/25/11 07:59	07/28/11 02:32	7440-47-3	
Cobalt	**15.3**	mg/kg	0.61	20	07/25/11 07:59	07/28/11 14:53	7440-48-4	
Copper	**2570**	mg/kg	3.1	100	07/25/11 07:59	07/28/11 02:36	7440-50-8	
Iron	**12800**	mg/kg	61.2	20	07/25/11 07:59	07/28/11 02:32	7439-89-6	
Lead	**1120**	mg/kg	0.61	100	07/25/11 07:59	07/28/11 02:36	7439-92-1	
Manganese	**1300**	mg/kg	3.1	100	07/25/11 07:59	07/28/11 02:36	7439-96-5	
Nickel	**6.8**	mg/kg	0.61	20	07/25/11 07:59	07/28/11 02:32	7440-02-0	
Zinc	**163**	mg/kg	6.1	20	07/25/11 07:59	07/28/11 02:32	7440-66-6	
7471 Mercury	Analytical Method: EPA 7471 Preparation Method: EPA 7471							
Mercury	**0.35**	mg/kg	0.027	1	07/22/11 14:31	08/01/11 15:07	7439-97-6	
Dry Weight	Analytical Method: % Moisture							
Percent Moisture	**37.2**	%	0.10	1		07/25/11 00:00		

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ANALYTICAL RESULTS

Project: Black Pine Mine REV
Pace Project No.: 10163645

Sample: BP-CML-TS-02-00 **Lab ID: 10163645009** Collected: 07/15/11 10:10 Received: 07/16/11 11:30 Matrix: Solid

Results reported on a "dry-weight" basis

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
6020 MET ICPMS	Analytical Method: EPA 6020 Preparation Method: EPA 3050							
Antimony	**6.9**	mg/kg	0.40	20	07/25/11 07:59	07/28/11 02:50	7440-36-0	
Arsenic	**11.2**	mg/kg	0.40	20	07/25/11 07:59	07/28/11 02:50	7440-38-2	
Barium	**34.7**	mg/kg	0.24	20	07/25/11 07:59	07/28/11 02:50	7440-39-3	
Cadmium	**0.84**	mg/kg	0.064	20	07/25/11 07:59	07/28/11 02:50	7440-43-9	
Chromium	**2.3**	mg/kg	0.40	20	07/25/11 07:59	07/28/11 02:50	7440-47-3	
Cobalt	**7.5**	mg/kg	0.40	20	07/25/11 07:59	07/28/11 02:50	7440-48-4	
Copper	**846**	mg/kg	2.0	100	07/25/11 07:59	07/28/11 02:53	7440-50-8	
Iron	**7930**	mg/kg	40.0	20	07/25/11 07:59	07/28/11 02:50	7439-89-6	
Lead	**32.3**	mg/kg	0.080	20	07/25/11 07:59	07/28/11 02:50	7439-92-1	
Manganese	**147**	mg/kg	0.40	20	07/25/11 07:59	07/28/11 02:50	7439-96-5	
Nickel	**4.5**	mg/kg	0.40	20	07/25/11 07:59	07/28/11 02:50	7440-02-0	
Zinc	**60.6**	mg/kg	4.0	20	07/25/11 07:59	07/28/11 02:50	7440-66-6	
7471 Mercury	Analytical Method: EPA 7471 Preparation Method: EPA 7471							
Mercury	**0.30**	mg/kg	0.021	1	07/22/11 14:31	08/01/11 15:09	7439-97-6	M1
Dry Weight	Analytical Method: % Moisture							
Percent Moisture	**14.3**	%	0.10	1		07/25/11 00:00		

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ANALYTICAL RESULTS

Project: Black Pine Mine REV
Pace Project No.: 10163645

Sample: BP-CML-TS-02-02 **Lab ID: 10163645010** Collected: 07/15/11 10:15 Received: 07/16/11 11:30 Matrix: Solid

Results reported on a "dry-weight" basis

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
6020 MET ICPMS	Analytical Method: EPA 6020 Preparation Method: EPA 3050							
Antimony	**7.5**	mg/kg	0.74	20	07/25/11 07:59	07/28/11 02:57	7440-36-0	
Arsenic	**11.3**	mg/kg	0.74	20	07/25/11 07:59	07/28/11 02:57	7440-38-2	
Barium	**365**	mg/kg	0.44	20	07/25/11 07:59	07/28/11 02:57	7440-39-3	
Cadmium	**2.3**	mg/kg	0.12	20	07/25/11 07:59	07/28/11 02:57	7440-43-9	
Chromium	**10.1**	mg/kg	0.74	20	07/25/11 07:59	07/28/11 02:57	7440-47-3	
Cobalt	**12.8**	mg/kg	0.74	20	07/25/11 07:59	07/28/11 02:57	7440-48-4	
Copper	**92.0**	mg/kg	0.74	20	07/25/11 07:59	07/28/11 02:57	7440-50-8	
Iron	**9680**	mg/kg	73.8	20	07/25/11 07:59	07/28/11 02:57	7439-89-6	
Lead	**44.9**	mg/kg	0.15	20	07/25/11 07:59	07/28/11 02:57	7439-92-1	
Manganese	**297**	mg/kg	0.74	20	07/25/11 07:59	07/28/11 02:57	7439-96-5	
Nickel	**13.9**	mg/kg	0.74	20	07/25/11 07:59	07/28/11 02:57	7440-02-0	
Zinc	**159**	mg/kg	7.4	20	07/25/11 07:59	07/28/11 02:57	7440-66-6	
7471 Mercury	Analytical Method: EPA 7471 Preparation Method: EPA 7471							
Mercury	**1.9**	mg/kg	0.30	10	07/25/11 14:10	07/26/11 10:36	7439-97-6	
Dry Weight	Analytical Method: % Moisture							
Percent Moisture	**38.4**	%	0.10	1		07/25/11 00:00		
Sobek Acid Base Potential	Analytical Method: Modified Sobek 3.2							
Neutralization Potential	**3.2**	tons/1000	0.50	1		08/02/11 00:00		
Sobek Extractable Sulfur	Analytical Method: Modified Sobek 3.2							
Sulfur, HCl Extractable	**<0.050**	% (w/w)	0.050	1		08/09/11 12:39		
Sulfur, HNO3 Extractable	**0.0754**	% (w/w)	0.050	1		08/09/11 12:39		
Sulfur, Hot Water Extractable	**0.0697**	% (w/w)	0.050	1		08/09/11 12:39		
Sulfur, Residual	**<0.050**	% (w/w)	0.050	1		08/09/11 12:39		
Total Sulfur	**0.174**	% (w/w)	0.050	1		08/09/11 12:39		
Sobek Calculations	Analytical Method: Modified Sobek 3.2							
Acid/Base Potential	**3.2**	tons/1000		1		08/02/11 00:00		
Acid Potential	**<4.3**	tons/1000	4.3	1		08/02/11 00:00		
Lime Requirement	**11**	tons/1000	5.4	1		08/02/11 00:00		
SMP Lime Requirement	**5.9**	tons/1000	0.0	1		08/02/11 00:00		
Sobek SMP Buffer pH	Analytical Method: Modified Sobek 3.2							
SMP Buffer pH	**5.9**	Std. Units	0.10	1		07/29/11 14:34		

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ANALYTICAL RESULTS

Project: Black Pine Mine REV
Pace Project No.: 10163645

Sample: BP-CML-SS-02-06 **Lab ID: 10163645011** Collected: 07/15/11 10:17 Received: 07/16/11 11:30 Matrix: Solid

Results reported on a "dry-weight" basis

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
6020 MET ICPMS	Analytical Method: EPA 6020 Preparation Method: EPA 3050							
Antimony	**10**	mg/kg	0.45	20	07/25/11 07:59	07/28/11 03:04	7440-36-0	M6
Arsenic	**11.9**	mg/kg	0.45	20	07/25/11 07:59	07/28/11 03:04	7440-38-2	
Barium	**178**	mg/kg	0.27	20	07/25/11 07:59	07/28/11 03:04	7440-39-3	M6
Cadmium	**3.1**	mg/kg	0.072	20	07/25/11 07:59	07/28/11 03:04	7440-43-9	
Chromium	**6.1**	mg/kg	0.45	20	07/25/11 07:59	07/28/11 03:04	7440-47-3	M6
Cobalt	**2.1**	mg/kg	0.45	20	07/25/11 07:59	07/28/11 03:04	7440-48-4	
Copper	**2360**	mg/kg	4.5	200	07/25/11 07:59	07/29/11 09:49	7440-50-8	M6
Iron	**5640**	mg/kg	45.1	20	07/25/11 07:59	07/28/11 03:04	7439-89-6	M6
Lead	**67.7**	mg/kg	0.090	20	07/25/11 07:59	07/28/11 03:04	7439-92-1	M6
Manganese	**67.2**	mg/kg	0.45	20	07/25/11 07:59	07/28/11 03:04	7439-96-5	M6
Nickel	**5.3**	mg/kg	0.45	20	07/25/11 07:59	07/28/11 03:04	7440-02-0	
Zinc	**108**	mg/kg	4.5	20	07/25/11 07:59	07/28/11 03:04	7440-66-6	M6
7471 Mercury	Analytical Method: EPA 7471 Preparation Method: EPA 7471							
Mercury	**9.1**	mg/kg	0.55	25	07/25/11 14:10	07/26/11 11:11	7439-97-6	
Dry Weight	Analytical Method: % Moisture							
Percent Moisture	**17.9**	%	0.10	1		07/25/11 00:00		

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ANALYTICAL RESULTS

Project: Black Pine Mine REV
Pace Project No.: 10163645

Sample: BP-CML-TS-03-00 **Lab ID: 10163645012** Collected: 07/15/11 10:40 Received: 07/16/11 11:30 Matrix: Solid

Results reported on a "dry-weight" basis

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
6020 MET ICPMS	Analytical Method: EPA 6020 Preparation Method: EPA 3050							
Antimony	**1370**	mg/kg	3.0	100	07/25/11 07:59	07/28/11 03:14	7440-36-0	
Arsenic	**1640**	mg/kg	3.0	100	07/25/11 07:59	07/28/11 03:14	7440-38-2	
Barium	**514**	mg/kg	0.36	20	07/25/11 07:59	07/28/11 03:11	7440-39-3	
Cadmium	**31.8**	mg/kg	0.095	20	07/25/11 07:59	07/28/11 03:11	7440-43-9	
Chromium	**<0.60**	mg/kg	0.60	20	07/25/11 07:59	07/28/11 03:11	7440-47-3	
Cobalt	**1.9**	mg/kg	0.60	20	07/25/11 07:59	07/28/11 03:11	7440-48-4	
Copper	**5420**	mg/kg	11.9	400	07/25/11 07:59	07/29/11 09:52	7440-50-8	
Iron	**25100**	mg/kg	59.5	20	07/25/11 07:59	07/28/11 03:11	7439-89-6	
Lead	**837**	mg/kg	6.0	1000	07/25/11 07:59	07/29/11 10:49	7439-92-1	
Manganese	**327**	mg/kg	0.60	20	07/25/11 07:59	07/28/11 03:11	7439-96-5	
Nickel	**1.6**	mg/kg	0.60	20	07/25/11 07:59	07/28/11 03:11	7440-02-0	
Zinc	**522**	mg/kg	6.0	20	07/25/11 07:59	07/28/11 03:11	7440-66-6	
7471 Mercury	Analytical Method: EPA 7471 Preparation Method: EPA 7471							
Mercury	**9.9**	mg/kg	0.69	25	07/25/11 14:10	07/26/11 11:13	7439-97-6	
Dry Weight	Analytical Method: % Moisture							
Percent Moisture	**38.2**	%	0.10	1		07/25/11 00:00		

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ANALYTICAL RESULTS

Project: Black Pine Mine REV
Pace Project No.: 10163645

Sample: BP-CML-TS-03-02 **Lab ID: 10163645013** Collected: 07/15/11 10:43 Received: 07/16/11 11:30 Matrix: Solid

Results reported on a "dry-weight" basis

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
6020 MET ICPMS	Analytical Method: EPA 6020 Preparation Method: EPA 3050							
Antimony	**1730**	mg/kg	2.7	100	07/25/11 07:59	07/28/11 03:36	7440-36-0	
Arsenic	**1610**	mg/kg	2.7	100	07/25/11 07:59	07/28/11 03:36	7440-38-2	
Barium	**471**	mg/kg	0.33	20	07/25/11 07:59	07/28/11 03:18	7440-39-3	
Cadmium	**23.7**	mg/kg	0.087	20	07/25/11 07:59	07/28/11 03:18	7440-43-9	
Chromium	**<0.55**	mg/kg	0.55	20	07/25/11 07:59	07/28/11 03:18	7440-47-3	
Cobalt	**<0.55**	mg/kg	0.55	20	07/25/11 07:59	07/28/11 03:18	7440-48-4	
Copper	**6240**	mg/kg	10.9	400	07/25/11 07:59	07/29/11 09:56	7440-50-8	
Iron	**29300**	mg/kg	273	100	07/25/11 07:59	07/28/11 03:36	7439-89-6	
Lead	**9390**	mg/kg	2.2	400	07/25/11 07:59	07/29/11 09:56	7439-92-1	
Manganese	**167**	mg/kg	0.55	20	07/25/11 07:59	07/28/11 03:18	7439-96-5	
Nickel	**0.69**	mg/kg	0.55	20	07/25/11 07:59	07/28/11 03:18	7440-02-0	
Zinc	**735**	mg/kg	27.3	100	07/25/11 07:59	07/28/11 03:36	7440-66-6	
7471 Mercury	Analytical Method: EPA 7471 Preparation Method: EPA 7471							
Mercury	**5.5**	mg/kg	0.67	25	07/25/11 14:10	07/26/11 11:15	7439-97-6	
Dry Weight	Analytical Method: % Moisture							
Percent Moisture	**25.5**	%	0.10	1		07/25/11 00:00		
Sobek Acid Base Potential	Analytical Method: Modified Sobek 3.2							
Neutralization Potential	**0.74**	tons/1000	0.50	1		08/02/11 00:00		
Sobek Extractable Sulfur	Analytical Method: Modified Sobek 3.2							
Sulfur, HCl Extractable	**0.0702**	% (w/w)	0.050	1		08/09/11 12:54		
Sulfur, HNO3 Extractable	**<0.050**	% (w/w)	0.050	1		08/09/11 12:54		
Sulfur, Hot Water Extractable	**0.126**	% (w/w)	0.050	1		08/09/11 12:54		
Sulfur, Residual	**<0.050**	% (w/w)	0.050	1		08/09/11 12:54		
Total Sulfur	**0.201**	% (w/w)	0.050	1		08/09/11 12:54		
Sobek Calculations	Analytical Method: Modified Sobek 3.2							
Acid/Base Potential	**0.74**	tons/1000		1		08/02/11 00:00		
Acid Potential	**<4.3**	tons/1000	4.3	1		08/02/11 00:00		
Lime Requirement	**<5.4**	tons/1000	5.4	1		08/02/11 00:00		
SMP Lime Requirement	**0**	tons/1000	0.0	1		08/02/11 00:00		
Sobek SMP Buffer pH	Analytical Method: Modified Sobek 3.2							
SMP Buffer pH	**7.0**	Std. Units	0.10	1		07/29/11 14:34		

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ANALYTICAL RESULTS

Project: Black Pine Mine REV
Pace Project No.: 10163645

Sample: BP-CML-SS-03-06 **Lab ID: 10163645014** Collected: 07/15/11 10:45 Received: 07/16/11 11:30 Matrix: Solid

Results reported on a "dry-weight" basis

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
6020 MET ICPMS	Analytical Method: EPA 6020 Preparation Method: EPA 3050							
Antimony	**750**	mg/kg	2.5	100	07/25/11 07:59	07/28/11 03:43	7440-36-0	
Arsenic	**777**	mg/kg	2.5	100	07/25/11 07:59	07/28/11 03:43	7440-38-2	
Barium	**370**	mg/kg	0.30	20	07/25/11 07:59	07/28/11 03:39	7440-39-3	
Cadmium	**15.0**	mg/kg	0.080	20	07/25/11 07:59	07/28/11 03:39	7440-43-9	
Chromium	**<0.50**	mg/kg	0.50	20	07/25/11 07:59	07/28/11 03:39	7440-47-3	
Cobalt	**2.5**	mg/kg	0.50	20	07/25/11 07:59	07/28/11 03:39	7440-48-4	
Copper	**3840**	mg/kg	10	400	07/25/11 07:59	07/29/11 09:59	7440-50-8	
Iron	**16200**	mg/kg	49.9	20	07/25/11 07:59	07/28/11 03:39	7439-89-6	
Lead	**5310**	mg/kg	2.0	400	07/25/11 07:59	07/29/11 09:59	7439-92-1	
Manganese	**136**	mg/kg	0.50	20	07/25/11 07:59	07/28/11 03:39	7439-96-5	
Nickel	**4.1**	mg/kg	0.50	20	07/25/11 07:59	07/28/11 03:39	7440-02-0	
Zinc	**384**	mg/kg	5.0	20	07/25/11 07:59	07/28/11 03:39	7440-66-6	
7471 Mercury	Analytical Method: EPA 7471 Preparation Method: EPA 7471							
Mercury	**12.6**	mg/kg	0.60	25	07/25/11 14:10	07/26/11 11:33	7439-97-6	
Dry Weight	Analytical Method: % Moisture							
Percent Moisture	**28.9**	%	0.10	1		07/25/11 00:00		

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QUALITY CONTROL DATA

Project: Black Pine Mine REV
Pace Project No.: 10163645

QC Batch: MPRP/27469 Analysis Method: CLPICPAES
QC Batch Method: ASA 13-3.5.2.2 Analysis Description: CLPICPAES MET
Associated Lab Samples: 10163645001, 10163645002

METHOD BLANK: 1024549 Matrix: Solid
Associated Lab Samples: 10163645001, 10163645002

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Potassium	mg/kg	<124	124	08/01/11 17:43	

LABORATORY CONTROL SAMPLE & LCSD: 1024550 1024551

Parameter	Units	Spike Conc.	LCS Result	LCSD Result	LCS % Rec	LCSD % Rec	% Rec Limits	RPD	Max RPD	Qualifiers
Potassium	mg/kg	156	177	210	114	135	80-120	17	20	

SAMPLE DUPLICATE: 1024552

Parameter	Units	10163634008 Result	Dup Result	RPD	Max RPD	Qualifiers
Potassium	mg/kg	<116	<125		30	

SAMPLE DUPLICATE: 1024553

Parameter	Units	10163644010 Result	Dup Result	RPD	Max RPD	Qualifiers
Potassium	mg/kg	<123	<125		30	

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QUALITY CONTROL DATA

Project: Black Pine Mine REV
Pace Project No.: 10163645

QC Batch: ICP/14917 Analysis Method: EPA 9081
QC Batch Method: EPA 9081 Analysis Description: Cation Exchange Capacity
Associated Lab Samples: 10163645001, 10163645002

METHOD BLANK: 853094 Matrix: Solid
Associated Lab Samples: 10163645001, 10163645002

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Cation Exchange Capacity	meq/100g	<1.0	1.0	08/05/11 13:25	

LABORATORY CONTROL SAMPLE: 853095

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Cation Exchange Capacity	meq/100g	53.2	53.1	100	62-138	

SAMPLE DUPLICATE: 853096

Parameter	Units	10163645001 Result	Dup Result	RPD	Max RPD	Qualifiers
Cation Exchange Capacity	meq/100g	14.7	14.1	4	47	

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QUALITY CONTROL DATA

Project: Black Pine Mine REV
Pace Project No.: 10163645

QC Batch: MPRP/27165 Analysis Method: EPA 6020
QC Batch Method: EPA 3050 Analysis Description: 6020 MET
Associated Lab Samples: 10163645001, 10163645002, 10163645003, 10163645004, 10163645005, 10163645006, 10163645007, 10163645008

METHOD BLANK: 1014843 Matrix: Solid
Associated Lab Samples: 10163645001, 10163645002, 10163645003, 10163645004, 10163645005, 10163645006, 10163645007, 10163645008, 10163645009, 10163645010, 10163645011, 10163645012, 10163645013, 10163645014

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Antimony	mg/kg	<0.50	0.50	07/28/11 01:18	
Arsenic	mg/kg	<0.50	0.50	07/28/11 01:18	
Barium	mg/kg	<0.30	0.30	07/28/11 01:18	
Cadmium	mg/kg	<0.079	0.079	07/28/11 01:18	
Chromium	mg/kg	<0.50	0.50	07/28/11 01:18	
Cobalt	mg/kg	<0.50	0.50	07/28/11 01:18	
Copper	mg/kg	<0.50	0.50	07/28/11 01:18	
Iron	mg/kg	<49.5	49.5	07/28/11 01:18	
Lead	mg/kg	<0.099	0.099	07/28/11 14:04	
Manganese	mg/kg	<0.50	0.50	07/28/11 01:18	
Nickel	mg/kg	<0.50	0.50	07/28/11 01:18	
Zinc	mg/kg	<5.0	5.0	07/28/11 01:18	

LABORATORY CONTROL SAMPLE: 1014844

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Antimony	mg/kg	19.2	19.1	99	75-125	
Arsenic	mg/kg	19.2	19.2	100	75-125	
Barium	mg/kg	19.2	19.3	101	75-125	
Cadmium	mg/kg	19.2	19.0	99	75-125	
Chromium	mg/kg	19.2	20.1	105	75-125	
Cobalt	mg/kg	19.2	20.0	104	75-125	
Copper	mg/kg	19.2	20.8	108	75-125	
Iron	mg/kg	240	280	117	75-125	
Lead	mg/kg	19.2	22.2	116	75-125	
Manganese	mg/kg	19.2	19.8	103	75-125	
Nickel	mg/kg	19.2	19.8	103	75-125	
Zinc	mg/kg	19.2	18.8	98	75-125	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 1014845 1014846

Parameter	Units	10163645001 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Antimony	mg/kg	0.63	19.4	18.2	15.4	12.0	76	62	75-125	25	20	D6,M6
Arsenic	mg/kg	6.1	19.4	18.2	26.2	24.1	103	99	75-125	8	20	
Barium	mg/kg	116	19.4	18.2	159	149	220	183	75-125	6	20	M6
Cadmium	mg/kg	0.079	19.4	18.2	19.8	19.0	102	104	75-125	4	20	
Chromium	mg/kg	10.9	19.4	18.2	33.7	31.1	117	111	75-125	8	20	

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QUALITY CONTROL DATA

Project: Black Pine Mine REV
Pace Project No.: 10163645

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 1014845 1014846

Parameter	Units	10163645001 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Cobalt	mg/kg	3.3	19.4	18.2	26.2	22.6	118	106	75-125	15	20	
Copper	mg/kg	9.6	19.4	18.2	31.1	27.9	111	101	75-125	11	20	
Iron	mg/kg	19300	242	227	20900	22800	660	1540	75-125	9	20	M6
Lead	mg/kg	12.1	19.4	18.2	35.6	33.5	121	118	75-125	6	20	
Manganese	mg/kg	224	19.4	18.2	400	191	903	-183	75-125	71	20	D6,M6
Nickel	mg/kg	6.0	19.4	18.2	27.0	26.1	108	111	75-125	3	20	
Zinc	mg/kg	22.8	19.4	18.2	44.4	43.1	111	112	75-125	3	20	
Zinc	mg/kg	22.8	19.4	18.2	44.4	42.0	111	106	75-125	6	20	

MATRIX SPIKE SAMPLE: 1014847

Parameter	Units	10163645011 Result	Spike Conc.	MS Result	MS % Rec	% Rec Limits	Qualifiers
Antimony	mg/kg	10	17	34.4	144	75-125	M6
Arsenic	mg/kg	11.9	17	28.1	95	75-125	
Barium	mg/kg	178	17	78.3	-585	75-125	M6
Cadmium	mg/kg	3.1	17	17.0	82	75-125	
Chromium	mg/kg	6.1	17	18.7	74	75-125	M6
Cobalt	mg/kg	2.1	17	16.2	83	75-125	
Copper	mg/kg	2360	17	554	-10600	75-125	M6
Iron	mg/kg	5640	213	5010	-296	75-125	M6
Lead	mg/kg	67.7	17	73.2	32	75-125	M6
Manganese	mg/kg	67.2	17	61.6	-33	75-125	M6
Nickel	mg/kg	5.3	17	18.8	80	75-125	
Zinc	mg/kg	108	17	109	8	75-125	M6

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QUALITY CONTROL DATA

Project: Black Pine Mine REV
Pace Project No.: 10163645

QC Batch: MERP/5651 Analysis Method: EPA 7471
QC Batch Method: EPA 7471 Analysis Description: 7471 Mercury
Associated Lab Samples: 10163645001, 10163645002, 10163645003, 10163645004, 10163645005, 10163645006, 10163645007, 10163645008, 10163645009

METHOD BLANK: 1016612 Matrix: Solid
Associated Lab Samples: 10163645001, 10163645002, 10163645003, 10163645004, 10163645005, 10163645006, 10163645007, 10163645008, 10163645009

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Mercury	mg/kg	<0.018	0.018	08/01/11 13:16	

LABORATORY CONTROL SAMPLE: 1016613

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Mercury	mg/kg	.45	0.46	102	80-120	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 1016614 1016615

Parameter	Units	10163643010 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Mercury	mg/kg	4.1	.62	.65	3.8	3.9	-53	-36	80-120	3	20	M6

MATRIX SPIKE SAMPLE: 1016616

Parameter	Units	10163645009 Result	Spike Conc.	MS Result	MS % Rec	% Rec Limits	Qualifiers
Mercury	mg/kg	0.30	.44	0.47	39	80-120	M1

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QUALITY CONTROL DATA

Project: Black Pine Mine REV
Pace Project No.: 10163645

QC Batch: MERP/5669 Analysis Method: EPA 7471
QC Batch Method: EPA 7471 Analysis Description: 7471 Mercury
Associated Lab Samples: 10163645010, 10163645011, 10163645012, 10163645013, 10163645014

METHOD BLANK: 1019298 Matrix: Solid
Associated Lab Samples: 10163645010, 10163645011, 10163645012, 10163645013, 10163645014

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Mercury	mg/kg	<0.019	0.019	07/26/11 10:21	

LABORATORY CONTROL SAMPLE: 1019299

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Mercury	mg/kg	.48	0.50	103	80-120	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 1019300 1019301

Parameter	Units	10164099001 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Mercury	mg/kg	ND	.5	.5	0.59	0.58	116	115	80-120	.9	20	

MATRIX SPIKE SAMPLE: 1019302

Parameter	Units	10164264006 Result	Spike Conc.	MS Result	MS % Rec	% Rec Limits	Qualifiers
Mercury	mg/kg	0.040	.68	0.83	115	80-120	

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QUALITY CONTROL DATA

Project: Black Pine Mine REV
Pace Project No.: 10163645

QC Batch: MPRP/27306 Analysis Method: % Moisture
QC Batch Method: % Moisture Analysis Description: Dry Weight/Percent Moisture
Associated Lab Samples: 10163645001, 10163645002, 10163645003, 10163645004, 10163645005, 10163645006, 10163645007, 10163645008

SAMPLE DUPLICATE: 1019478

Parameter	Units	10163643009 Result	Dup Result	RPD	Max RPD	Qualifiers
Percent Moisture	%	16.2	16.3	1	30	

SAMPLE DUPLICATE: 1019479

Parameter	Units	10163645008 Result	Dup Result	RPD	Max RPD	Qualifiers
Percent Moisture	%	37.2	40.7	9	30	

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QUALITY CONTROL DATA

Project: Black Pine Mine REV
Pace Project No.: 10163645

QC Batch: MPRP/27307 Analysis Method: % Moisture
QC Batch Method: % Moisture Analysis Description: Dry Weight/Percent Moisture
Associated Lab Samples: 10163645009, 10163645010, 10163645011, 10163645012, 10163645013, 10163645014

SAMPLE DUPLICATE: 1019547

Parameter	Units	10163645009 Result	Dup Result	RPD	Max RPD	Qualifiers
Percent Moisture	%	14.3	15.0	5	30	

SAMPLE DUPLICATE: 1019548

Parameter	Units	10163437014 Result	Dup Result	RPD	Max RPD	Qualifiers
Percent Moisture	%	29.7	28.2	5	30	

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QUALITY CONTROL DATA

Project: Black Pine Mine REV
Pace Project No.: 10163645

QC Batch: MT/6442 Analysis Method: ASA 33-3.2/EPA 353.2
QC Batch Method: ASA 33-3.2/EPA 353.2 Analysis Description: 353.2 Nitrate + Nitrite
Associated Lab Samples: 10163645001, 10163645002

METHOD BLANK: 1016641 Matrix: Solid
Associated Lab Samples: 10163645001, 10163645002

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Available Nitrate	mg/kg	<5.0	5.0	07/26/11 17:37	

LABORATORY CONTROL SAMPLE: 1016642

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Available Nitrate	mg/kg	25	24.0	96	76-124	

SAMPLE DUPLICATE: 1016643

Parameter	Units	10163246004 Result	Dup Result	RPD	Max RPD	Qualifiers
Available Nitrate	mg/kg	<5.0	<5.0		30	

SAMPLE DUPLICATE: 1016644

Parameter	Units	10163644008 Result	Dup Result	RPD	Max RPD	Qualifiers
Available Nitrate	mg/kg	<5.0	<5.0		30	

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QUALITY CONTROL DATA

Project: Black Pine Mine REV
Pace Project No.: 10163645

QC Batch: MT/6438 Analysis Method: ASA 29-3.5.2
QC Batch Method: ASA 29-3.5.2 Analysis Description: Organic Matter ASA 29
Associated Lab Samples: 10163645001, 10163645002

METHOD BLANK: 1016290 Matrix: Solid
Associated Lab Samples: 10163645001, 10163645002

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Organic Matter	% (w/w)	<0.10	0.10	07/21/11 16:50	

LABORATORY CONTROL SAMPLE: 1016291

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Organic Matter	% (w/w)	3.1	3.3	107	69-131	

SAMPLE DUPLICATE: 1016293

Parameter	Units	10163634008 Result	Dup Result	RPD	Max RPD	Qualifiers
Organic Matter	% (w/w)	0.13	<0.10		30	

SAMPLE DUPLICATE: 1018103

Parameter	Units	10163246002 Result	Dup Result	RPD	Max RPD	Qualifiers
Organic Matter	% (w/w)	3.3	3.2	2	30	

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QUALITY CONTROL DATA

Project: Black Pine Mine REV
Pace Project No.: 10163645

QC Batch: MT/6426 Analysis Method: ASA 10-3.2
QC Batch Method: ASA 10-3.2 Analysis Description: ASA 10-3.2 pH saturated paste
Associated Lab Samples: 10163645001, 10163645002

SAMPLE DUPLICATE: 1017424

Parameter	Units	10163246004 Result	Dup Result	RPD	Max RPD	Qualifiers
pH, Saturated Paste	Std. Units	7.0	6.9	.7	20	

SAMPLE DUPLICATE: 1017425

Parameter	Units	10163645001 Result	Dup Result	RPD	Max RPD	Qualifiers
pH, Saturated Paste	Std. Units	6.9	6.7	2	20	

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QUALITY CONTROL DATA

Project: Black Pine Mine REV
Pace Project No.: 10163645

QC Batch: MT/6443 Analysis Method: ASA 24-5.4/SM4500
QC Batch Method: ASA 24-5.4/SM4500 Analysis Description: SM4500P-E, Total Phosphorus
Associated Lab Samples: 10163645001, 10163645002

METHOD BLANK: 1016645 Matrix: Solid
Associated Lab Samples: 10163645001, 10163645002

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Available Phosphorus	mg/kg	<1.0	1.0	07/25/11 14:30	

LABORATORY CONTROL SAMPLE: 1016646

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Available Phosphorus	mg/kg	10	8.0	80	56-144	

SAMPLE DUPLICATE: 1016647

Parameter	Units	10163246004 Result	Dup Result	RPD	Max RPD	Qualifiers
Available Phosphorus	mg/kg	2.8	3.1	9	30	

SAMPLE DUPLICATE: 1016648

Parameter	Units	10163644006 Result	Dup Result	RPD	Max RPD	Qualifiers
Available Phosphorus	mg/kg	1.4	1.4	3	30	

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QUALITY CONTROL DATA

Project: Black Pine Mine REV
Pace Project No.: 10163645

QC Batch: MT/6498 Analysis Method: Modified Sobek 3.2
QC Batch Method: Modified Sobek 3.2 Analysis Description: Sobek Acid Base Potential
Associated Lab Samples: 10163645001, 10163645002, 10163645003, 10163645007, 10163645010, 10163645013

METHOD BLANK: 1020554 Matrix: Solid
Associated Lab Samples: 10163645001, 10163645002, 10163645003, 10163645007, 10163645010, 10163645013

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Neutralization Potential	tons/1000	<0.5	0.50	08/02/11 00:00	

SAMPLE DUPLICATE: 1020555

Parameter	Units	10163645001 Result	Dup Result	RPD	Max RPD	Qualifiers
Neutralization Potential	tons/1000	2.0	1.7			

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Pace Analytical Services, Inc.
602 S 25th Street
Billings, MT 591014549
(406)254-7226

QUALITY CONTROL DATA

Project: Black Pine Mine REV
Pace Project No.: 10163645

QC Batch: MT/6489 Analysis Method: Modified Sobek 3.2
QC Batch Method: Modified Sobek 3.2 Analysis Description: Sobek Extractable Sulfur
Associated Lab Samples: 10163645001, 10163645002, 10163645003, 10163645007, 10163645010, 10163645013

METHOD BLANK: 1019980 Matrix: Solid
Associated Lab Samples: 10163645001, 10163645002, 10163645003, 10163645007, 10163645010, 10163645013

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Total Sulfur	% (w/w)	<0.050	0.050	08/09/11 10:56	

SAMPLE DUPLICATE: 1019982

Parameter	Units	10163645001 Result	Dup Result	RPD	Max RPD	Qualifiers
Total Sulfur	% (w/w)	<0.050	<0.050			

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QUALITY CONTROL DATA

Project: Black Pine Mine REV
Pace Project No.: 10163645

QC Batch: MT/6544 Analysis Method: Modified Sobek 3.2
QC Batch Method: Modified Sobek 3.2 Analysis Description: Sobek SMP Buffer pH
Associated Lab Samples: 10163645001, 10163645002, 10163645003, 10163645007, 10163645010, 10163645013

SAMPLE DUPLICATE: 1022821

Parameter	Units	10163645001 Result	Dup Result	RPD	Max RPD	Qualifiers
SMP Buffer pH	Std. Units	6.8	6.9	1	20	

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QUALITY CONTROL DATA

Project: Black Pine Mine REV
Pace Project No.: 10163645

QC Batch: MT/6547 Analysis Method: ASA 10-3.3
QC Batch Method: ASA 10-3.3 Analysis Description: ASA 10-3.3 Specific Conductance
Associated Lab Samples: 10163645001, 10163645002

METHOD BLANK: 1022940 Matrix: Water
Associated Lab Samples: 10163645001, 10163645002

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Sp.Conductance Saturated Paste	mmhos/cm	<0.010	0.010	07/27/11 12:56	

LABORATORY CONTROL SAMPLE: 1022941

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Sp.Conductance Saturated Paste	mmhos/cm	.85	0.80	94	53-147	

SAMPLE DUPLICATE: 1022942

Parameter	Units	10163246004 Result	Dup Result	RPD	Max RPD	Qualifiers
Sp.Conductance Saturated Paste	mmhos/cm	0.091	0.088	3	20	

SAMPLE DUPLICATE: 1022943

Parameter	Units	10163645001 Result	Dup Result	RPD	Max RPD	Qualifiers
Sp.Conductance Saturated Paste	mmhos/cm	0.20	0.14	33	20	D6

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QUALIFIERS

Project: Black Pine Mine REV
Pace Project No.: 10163645

DEFINITIONS

DF - Dilution Factor, if reported, represents the factor applied to the reported data due to changes in sample preparation, dilution of the sample aliquot, or moisture content.

ND - Not Detected at or above adjusted reporting limit.

J - Estimated concentration above the adjusted method detection limit and below the adjusted reporting limit.

MDL - Adjusted Method Detection Limit.

S - Surrogate

1,2-Diphenylhydrazine (8270 listed analyte) decomposes to Azobenzene.

Consistent with EPA guidelines, unrounded data are displayed and have been used to calculate % recovery and RPD values.

LCS(D) - Laboratory Control Sample (Duplicate)

MS(D) - Matrix Spike (Duplicate)

DUP - Sample Duplicate

RPD - Relative Percent Difference

NC - Not Calculable.

SG - Silica Gel - Clean-Up

U - Indicates the compound was analyzed for, but not detected.

N-Nitrosodiphenylamine decomposes and cannot be separated from Diphenylamine using Method 8270. The result reported for each analyte is a combined concentration.

LABORATORIES

PASI-K	Pace Analytical Services - Kansas City
PASI-M	Pace Analytical Services - Minneapolis
PASI-MT	Pace Analytical Services - Montana

ANALYTE QUALIFIERS

D6	The relative percent difference (RPD) between the sample and sample duplicate exceeded laboratory control limits.
M1	Matrix spike recovery exceeded QC limits. Batch accepted based on laboratory control sample (LCS) recovery.
M6	Matrix spike and Matrix spike duplicate recovery not evaluated against control limits due to sample dilution.

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QUALITY CONTROL DATA CROSS REFERENCE TABLE

Project: Black Pine Mine REV
Pace Project No.: 10163645

Lab ID	Sample ID	QC Batch Method	QC Batch	Analytical Method	Analytical Batch
10163645001	**BP-CML-TS-11-01**	ASA 13-3.5.2.2	MPRP/27469	CLPICPAES	ICP/11638
10163645002	**BP-CML-TS-11-08**	ASA 13-3.5.2.2	MPRP/27469	CLPICPAES	ICP/11638
10163645001	**BP-CML-TS-11-01**	EPA 9081	ICP/14917	EPA 9081	ICP/13002
10163645002	**BP-CML-TS-11-08**	EPA 9081	ICP/14917	EPA 9081	ICP/13002
10163645001	**BP-CML-TS-11-01**	EPA 3050	MPRP/27165	EPA 6020	ICPM/11110
10163645002	**BP-CML-TS-11-08**	EPA 3050	MPRP/27165	EPA 6020	ICPM/11110
10163645003	**BP-CML-TS-10-00**	EPA 3050	MPRP/27165	EPA 6020	ICPM/11110
10163645004	**BP-CML-TS-10-02**	EPA 3050	MPRP/27165	EPA 6020	ICPM/11110
10163645005	**BP-CML-SS-10-06**	EPA 3050	MPRP/27165	EPA 6020	ICPM/11110
10163645006	**BP-CML-TS-01-00**	EPA 3050	MPRP/27165	EPA 6020	ICPM/11110
10163645007	**BP-CML-TS-01-02**	EPA 3050	MPRP/27165	EPA 6020	ICPM/11110
10163645008	**BP-CML-SS-01-06**	EPA 3050	MPRP/27165	EPA 6020	ICPM/11110
10163645009	**BP-CML-TS-02-00**	EPA 3050	MPRP/27165	EPA 6020	ICPM/11110
10163645010	**BP-CML-TS-02-02**	EPA 3050	MPRP/27165	EPA 6020	ICPM/11110
10163645011	**BP-CML-SS-02-06**	EPA 3050	MPRP/27165	EPA 6020	ICPM/11110
10163645012	**BP-CML-TS-03-00**	EPA 3050	MPRP/27165	EPA 6020	ICPM/11110
10163645013	**BP-CML-TS-03-02**	EPA 3050	MPRP/27165	EPA 6020	ICPM/11110
10163645014	**BP-CML-SS-03-06**	EPA 3050	MPRP/27165	EPA 6020	ICPM/11110
10163645001	**BP-CML-TS-11-01**	EPA 7471	MERP/5651	EPA 7471	MERC/6471
10163645002	**BP-CML-TS-11-08**	EPA 7471	MERP/5651	EPA 7471	MERC/6471
10163645003	**BP-CML-TS-10-00**	EPA 7471	MERP/5651	EPA 7471	MERC/6471
10163645004	**BP-CML-TS-10-02**	EPA 7471	MERP/5651	EPA 7471	MERC/6471
10163645005	**BP-CML-SS-10-06**	EPA 7471	MERP/5651	EPA 7471	MERC/6471
10163645006	**BP-CML-TS-01-00**	EPA 7471	MERP/5651	EPA 7471	MERC/6471
10163645007	**BP-CML-TS-01-02**	EPA 7471	MERP/5651	EPA 7471	MERC/6471
10163645008	**BP-CML-SS-01-06**	EPA 7471	MERP/5651	EPA 7471	MERC/6471
10163645009	**BP-CML-TS-02-00**	EPA 7471	MERP/5651	EPA 7471	MERC/6471
10163645010	**BP-CML-TS-02-02**	EPA 7471	MERP/5669	EPA 7471	MERC/6473
10163645011	**BP-CML-SS-02-06**	EPA 7471	MERP/5669	EPA 7471	MERC/6473
10163645012	**BP-CML-TS-03-00**	EPA 7471	MERP/5669	EPA 7471	MERC/6473
10163645013	**BP-CML-TS-03-02**	EPA 7471	MERP/5669	EPA 7471	MERC/6473
10163645014	**BP-CML-SS-03-06**	EPA 7471	MERP/5669	EPA 7471	MERC/6473
10163645001	**BP-CML-TS-11-01**	% Moisture	MPRP/27306		
10163645002	**BP-CML-TS-11-08**	% Moisture	MPRP/27306		
10163645003	**BP-CML-TS-10-00**	% Moisture	MPRP/27306		
10163645004	**BP-CML-TS-10-02**	% Moisture	MPRP/27306		
10163645005	**BP-CML-SS-10-06**	% Moisture	MPRP/27306		
10163645006	**BP-CML-TS-01-00**	% Moisture	MPRP/27306		
10163645007	**BP-CML-TS-01-02**	% Moisture	MPRP/27306		
10163645008	**BP-CML-SS-01-06**	% Moisture	MPRP/27306		
10163645009	**BP-CML-TS-02-00**	% Moisture	MPRP/27307		
10163645010	**BP-CML-TS-02-02**	% Moisture	MPRP/27307		
10163645011	**BP-CML-SS-02-06**	% Moisture	MPRP/27307		
10163645012	**BP-CML-TS-03-00**	% Moisture	MPRP/27307		
10163645013	**BP-CML-TS-03-02**	% Moisture	MPRP/27307		
10163645014	**BP-CML-SS-03-06**	% Moisture	MPRP/27307		

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QUALITY CONTROL DATA CROSS REFERENCE TABLE

Project: Black Pine Mine REV
Pace Project No.: 10163645

Lab ID	Sample ID	QC Batch Method	QC Batch	Analytical Method	Analytical Batch
10163645001	**BP-CML-TS-11-01**	ASA 33-3.2/EPA 353.2	MT/6442		
10163645002	**BP-CML-TS-11-08**	ASA 33-3.2/EPA 353.2	MT/6442		
10163645001	**BP-CML-TS-11-01**	ASTM D421	MT/6412		
10163645002	**BP-CML-TS-11-08**	ASTM D421	MT/6412		
10163645001	**BP-CML-TS-11-01**	ASA 29-3.5.2	MT/6438		
10163645002	**BP-CML-TS-11-08**	ASA 29-3.5.2	MT/6438		
10163645001	**BP-CML-TS-11-01**	ASA 10-3.2	MT/6426		
10163645002	**BP-CML-TS-11-08**	ASA 10-3.2	MT/6426		
10163645001	**BP-CML-TS-11-01**	ASA 24-5.4/SM4500	MT/6443		
10163645002	**BP-CML-TS-11-08**	ASA 24-5.4/SM4500	MT/6443		
10163645001	**BP-CML-TS-11-01**	Modified Sobek 3.2	MT/6498		
10163645002	**BP-CML-TS-11-08**	Modified Sobek 3.2	MT/6498		
10163645003	**BP-CML-TS-10-00**	Modified Sobek 3.2	MT/6498		
10163645007	**BP-CML-TS-01-02**	Modified Sobek 3.2	MT/6498		
10163645010	**BP-CML-TS-02-02**	Modified Sobek 3.2	MT/6498		
10163645013	**BP-CML-TS-03-02**	Modified Sobek 3.2	MT/6498		
10163645001	**BP-CML-TS-11-01**	Modified Sobek 3.2	MT/6489		
10163645002	**BP-CML-TS-11-08**	Modified Sobek 3.2	MT/6489		
10163645003	**BP-CML-TS-10-00**	Modified Sobek 3.2	MT/6489		
10163645007	**BP-CML-TS-01-02**	Modified Sobek 3.2	MT/6489		
10163645010	**BP-CML-TS-02-02**	Modified Sobek 3.2	MT/6489		
10163645013	**BP-CML-TS-03-02**	Modified Sobek 3.2	MT/6489		
10163645001	**BP-CML-TS-11-01**	Modified Sobek 3.2	MT/6502		
10163645002	**BP-CML-TS-11-08**	Modified Sobek 3.2	MT/6502		
10163645003	**BP-CML-TS-10-00**	Modified Sobek 3.2	MT/6502		
10163645007	**BP-CML-TS-01-02**	Modified Sobek 3.2	MT/6502		
10163645010	**BP-CML-TS-02-02**	Modified Sobek 3.2	MT/6502		
10163645013	**BP-CML-TS-03-02**	Modified Sobek 3.2	MT/6502		
10163645001	**BP-CML-TS-11-01**	Modified Sobek 3.2	MT/6544		
10163645002	**BP-CML-TS-11-08**	Modified Sobek 3.2	MT/6544		
10163645003	**BP-CML-TS-10-00**	Modified Sobek 3.2	MT/6544		
10163645007	**BP-CML-TS-01-02**	Modified Sobek 3.2	MT/6544		
10163645010	**BP-CML-TS-02-02**	Modified Sobek 3.2	MT/6544		
10163645013	**BP-CML-TS-03-02**	Modified Sobek 3.2	MT/6544		
10163645001	**BP-CML-TS-11-01**	ASA 10-3.3	MT/6547		
10163645002	**BP-CML-TS-11-08**	ASA 10-3.3	MT/6547		

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CHAIN-OF-CUSTODY / Analytical Request Document

The Chain-of-Custody is a LEGAL DOCUMENT. All relevant fields must be completed accurately.

Page: 1 of 2

1429908

Section A Required Client Information:	Section B Required Project Information:	Section C Invoice Information:
Company: Herrera	Report To: Kevin Houck	Attention:
Address:	Copy To:	Company Name: DEQ
		Address:
Email To:	Purchase Order No.:	Pace Quote Reference:
Phone: Fax:	Project Name: Black Pine Mine	Pace Project Manager:
Requested Due Date/TAT:	Project Number:	Pace Profile #:

REGULATORY AGENCY

☐ NPDES ☐ GROUND WATER ☐ DRINKING WATER

☐ UST ☐ RCRA ☐ OTHER _____

Site Location STATE: _____

Section D Required Client Information

SAMPLE ID
(A-Z, 0-9 / ,-)
Sample IDs MUST BE UNIQUE

Matrix Codes — MATRIX / CODE
Drinking Water DW
Water WT
Waste Water WW
Product P
Soil/Solid SL
Oil OL
Wipe WP
Air AR
Tissue TS
Other OT

Requested Analysis Filtered (Y/N)

10163645

ITEM #	SAMPLE ID	MATRIX CODE (see valid codes to left)	SAMPLE TYPE (G=GRAB C=COMP)	COLLECTED COMPOSITE START DATE	COMPOSITE START TIME	COMPOSITE END/GRAB DATE	COMPOSITE END/GRAB TIME	SAMPLE TEMP AT COLLECTION	# OF CONTAINERS	Preservatives: Unpreserved	H_2SO_4	HNO_3	HCl	NaOH	$Na_2S_2O_3$	Methanol	Other	Analysis Test Y/N	Tot Rec. Met	Agriculture	ABA	Moisture Content	Residual Chlorine (Y/N)	Pace Project No./ Lab I.D.
1	BP-CML-TS-11-01	SL	G			7/15/11	0735		2	X									X	X				001
2	BP-CML-TS-11-08	SL	G			7/15/11	0740		2	X									X	X				002
3	BP-CML-TS-10-00	"	"			"	0850		2	X									X		X	X		003
4	BP-CML-TS-10-02	"	"			"	0852		1	X									X			X		004
5	BP-CML-TS-10-06	↓	↓			↓	0854		1	X									X					005
6	BP-CML-TS-01-00	SL	G			7/15/11	0940		1	X									X			X		006
7	BP-CML-TS-01-02	"	"			"	0942		2	X									X		X	X		007
8	BP-CML-SS-01-06	↓	↓			↓	0945		1	X									X					008
9	BP-CML-TS-02-00	SL	G			7/15/11	1010		1	X									X			X		009
10	BP-CML-TS-02-02	"	"			"	1015		2	X									X		X	X		010
11	BP-CML-SS-02-06	↓	↓			↓	1017		1	X									X					011
12	BP-CML-TS-03-00	SL	G			7/15/11	1040		1	X									X			X		012

Agriculture = pH, CEC, cond, nitrogen, phosphorus, potassium, Organic matter, lime w/ fert. rec.

ADDITIONAL COMMENTS	RELINQUISHED BY / AFFILIATION	DATE	TIME	ACCEPTED BY / AFFILIATION	DATE	TIME	SAMPLE CONDITIONS			
Tot Recover. met = Sb, As, Ba, Cd, Cr, Co, Cu, Fe, Pb, Mn, Hg, Ni, Zn	Fed Ex (E) pickup 7/16	7/16/11	11:30	Pace	7/16/11	1130	3°C	Y	Y	Y

ORIGINAL

SAMPLER NAME AND SIGNATURE

PRINT Name of SAMPLER: ALEX SVENDSEN

SIGNATURE of SAMPLER: _____ DATE Signed (MM/DD/YY): 7/15/11

Temp in °C | Received on Ice (Y/N) | Custody Sealed Cooler (Y/N) | Samples Intact (Y/N)

*Important Note: By signing this form you are accepting Pace's NET 30 day payment terms and agreeing to late charges of 1.5% per month for any invoices not paid within 30 days.

F-ALL-Q-020rev.07, 15-May-2007

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CHAIN-OF-CUSTODY / Analytical Request Document

The Chain-of-Custody is a LEGAL DOCUMENT. All relevant fields must be completed accurately.

1429911

Section A Required Client Information:	Section B Required Project Information:	Section C Invoice Information:
Company: Herrera	Report To: Kevin Houck	Attention:
Address:	Copy To:	Company Name: DEQ
		Address:
Email To:	Purchase Order No.:	Pace Quote Reference:
Phone: Fax:	Project Name: Black Pine Mine	Pace Project Manager:
Requested Due Date/TAT:	Project Number:	Pace Profile #:

REGULATORY AGENCY: ☐ NPDES ☐ GROUND WATER ☐ DRINKING WATER ☐ UST ☐ RCRA ☐ OTHER

Site Location STATE:

Requested Analysis Filtered (Y/N)

ITEM #	Section D Required Client Information: SAMPLE ID (A-Z, 0-9 / ,-) Sample IDs MUST BE UNIQUE	Matrix Codes MATRIX / CODE: Drinking Water DW, Water WT, Waste Water WW, Product P, Soil/Solid SL, Oil OL, Wipe WP, Air AR, Tissue TS, Other OT	MATRIX CODE (see valid codes to left)	SAMPLE TYPE (G=GRAB C=COMP)	COLLECTED: COMPOSITE START DATE	COMPOSITE START TIME	COMPOSITE END/GRAB DATE	COMPOSITE END/GRAB TIME	SAMPLE TEMP AT COLLECTION	# OF CONTAINERS	Preservatives: Unpreserved	H_2SO_4	HNO_3	HCl	NaOH	$Na_2S_2O_3$	Methanol	Other	Y/N	Analysis Test ↓	Tot. Rec. Met	RBA	Moisture content	Residual Chlorine (Y/N)	Pace Project No./ Lab I.D.
1	BP-CML-TS-03-02		SL	G		7/15/11		1043		2	X									X	X	X			013
2	BP-CML-SS-03-06		SL	G			7/15/11	1045		1	X									X					014
3																									
4																									
5																									
6																									
7																									
8																									
9																									
10																									
11																									
12																									

101163645

ADDITIONAL COMMENTS	RELINQUISHED BY / AFFILIATION	DATE	TIME	ACCEPTED BY / AFFILIATION	DATE	TIME	SAMPLE CONDITIONS			
Tot recoverable metals = Sb, As, Ba, Cd, Cr, Co, Cu, Fe, Pb, Mn, Hg, Ni, Zn	FedEx Ground Pickup	7/16/11	1130	Pace	7/16/11	1130	3°C	Y	Y	Y

ORIGINAL

SAMPLER NAME AND SIGNATURE

PRINT Name of SAMPLER: ALEX SVENDSEN

SIGNATURE of SAMPLER: DATE Signed (MM/DD/YY): 7/15/11

Temp in °C | Received on Ice (Y/N) | Custody Sealed Cooler (Y/N) | Samples Intact (Y/N)

*Important Note: By signing this form you are accepting Pace's NET 30 day payment terms and agreeing to late charges of 1.5% per month for any invoices not paid within 30 days.

Sample Condition Upon Receipt

Pace Analytical

Client Name: MDEQ - BLACK PINE Project # 10163645

Courier: [X] Fed Ex [ ] UPS [ ] USPS [ ] Client [ ] Commercial [ ] Pace Other _____

Tracking #: 8762 4930 8789

Custody Seal on Cooler/Box Present: [X] yes [ ] no Seals intact: [X] yes [ ] no

Packing Material: [ ] Bubble Wrap [X] Bubble Bags [ ] None [ ] Other _____ Temp Blank: Yes [X] No [ ]

Thermometer Used 383045 or 135 Type of Ice: (Wet) Blue None [X] Samples on ice, cooling process has begun

Cooler Temperature 3.0° Biological Tissue is Frozen: Yes No

Temp should be above freezing to 6°C

Date and Initials of person examining contents: MCT 7/17/11

Comments:

Chain of Custody Present:	[X] Yes	[ ] No	[ ] N/A
Chain of Custody Filled Out:	[X] Yes	[ ] No	[ ] N/A
Chain of Custody Relinquished:	[X] Yes	[ ] No	[ ] N/A
Sampler Name & Signature on COC:	[X] Yes	[ ] No	[ ] N/A
Samples Arrived within Hold Time:	[X] Yes	[ ] No	[ ] N/A
Short Hold Time Analysis (<72hr):	[ ] Yes	[X] No	[ ] N/A
Rush Turn Around Time Requested:	[ ] Yes	[X] No	[ ] N/A
Sufficient Volume:	[X] Yes	[ ] No	[ ] N/A
Correct Containers Used:	[X] Yes	[ ] No	[ ] N/A
-Pace Containers Used:	[X] Yes	[ ] No	[ ] N/A
Containers Intact:	[X] Yes	[ ] No	[ ] N/A
Filtered volume received for Dissolved tests	[ ] Yes	[ ] No	[X] N/A
Sample Labels match COC:	[X] Yes	[ ] No	[ ] N/A
-Includes date/time/ID/Analysis Matrix: SOIL			
All containers needing acid/base preservation have been checked. Noncompliance are noted in 13.	[ ] Yes	[ ] No	[X] N/A
All containers needing preservation are found to be in compliance with EPA recommendation.	[ ] Yes	[ ] No	[X] N/A
Exceptions: VOA,Coliform, TOC, Oil and Grease, WI-DRO (water)	[ ] Yes	[X] No	
Samples checked for dechlorination:	[ ] Yes	[ ] No	[X] N/A
Headspace in VOA Vials (>6mm):	[ ] Yes	[ ] No	[X] N/A
Trip Blank Present:	[ ] Yes	[ ] No	[X] N/A
Trip Blank Custody Seals Present	[ ] Yes	[ ] No	[X] N/A
Pace Trip Blank Lot # (if purchased):			

1.
2.
3.
4.
5.
6.
7.
8.
9.
10.
11.
12.
13. [ ] HNO3 [ ] H2SO4 [ ] NaOH [ ] HCl Samp #

Initial when completed | Lot # of added preservative

14.
15.
16.

Client Notification/ Resolution: Field Data Required? Y / N

Person Contacted: _____ Date/Time: _____

Comments/ Resolution: _____

Project Manager Review: [signature] **Date:** 7/17/11

Note: Whenever there is a discrepancy affecting North Carolina compliance samples, a copy of this form will be sent to the North Carolina DEHNR Certification Office (i.e out of hold, incorrect preservative, out of temp, incorrect containers)

Pace Analytical Services, Inc.
602 S 25th Street
Billings, MT 591014549
(406)254-7226

October 18, 2011

Kevin Houck
Herrera Environmental Consultants
101 East Broadway, Suite 610
Missoula, MT 59802

RE: Project: Black Pine Mine (06) REV
Pace Project No.: 10166973

Dear Kevin Houck:
Enclosed are the analytical results for sample(s) received by the laboratory on August 18, 2011. The results relate only to the samples included in this report.

This report has been revised to add Cobalt and delete Silver.R

If you have any questions concerning this report, please feel free to contact me.

Sincerely,

Shawn Davis for
Sally Heinje
sally.heinje@pacelabs.com
Project Manager

Enclosures

cc: Devin Clary, Montana Dept. of Environmental Quality
Mark Donner, Trihydro
Jamie Mongoven, Montana Dept. of Environmental

REPORT OF LABORATORY ANALYSIS

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Pace Analytical Services, Inc.
602 S 25th Street
Billings, MT 591014549
(406)254-7226

CERTIFICATIONS

Project: Black Pine Mine (06) REV
Pace Project No.: 10166973

Minnesota Certification IDs

1700 Elm Street SE Suite 200, Minneapolis, MN 55414
A2LA Certification #: 2926.01
Alaska Certification #: UST-078
Alaska Certification #MN00064
Arizona Certification #: AZ-0014
Arkansas Certification #: 88-0680
California Certification #: 01155CA
EPA Region 8 Certification #: Pace
Florida/NELAP Certification #: E87605
Georgia Certification #: 959
Idaho Certification #: MN00064
Illinois Certification #: 200011
Iowa Certification #: 368
Kansas Certification #: E-10167
Louisiana Certification #: 03086
Louisiana Certification #: LA080009
Maine Certification #: 2007029
Maryland Certification #: 322
Michigan DEQ Certification #: 9909
Minnesota Certification #: 027-053-137
Mississippi Certification #: Pace
Montana Certification #: MT CERT0092
Nebraska Certification #: Pace
Nevada Certification #: MN_00064
New Jersey Certification #: MN-002
New Mexico Certification #: Pace
New York Certification #: 11647
North Carolina Certification #: 530
North Dakota Certification #: R-036
North Dakota Certification #: R-036A
Ohio VAP Certification #: CL101
Oklahoma Certification #: D9921
Oklahoma Certification #: 9507
Oregon Certification #: MN200001
Pennsylvania Certification #: 68-00563
Puerto Rico Certification
Tennessee Certification #: 02818
Texas Certification #: T104704192
Washington Certification #: C754
Wisconsin Certification #: 999407970

Montana Certification IDs

602 South 25th Street, Billings, MT 59101
EPA Region 8 Certification #: 8TMS-Q
Idaho Certification #: MT00012
Montana Certification #: MT CERT0040
NVLAP Certification #: 101292-0
Minnesota Dept of Health Certification #: 030-999-442

Kansas Certification IDs

9608 Loiret Boulevard, Lenexa, KS 66219
A2LA Certification #: 2456.01
Arkansas Certification #: 05-008-0
Illinois Certification #: 001191
Iowa Certification #: 118
Kansas/NELAP Certification #: E-10116
Louisiana Certification #: 03055
Nevada Certification #: KS000212008A
Oklahoma Certification #: 9205/9935
Texas Certification #: T104704407-08-TX
Utah Certification #: 9135995665

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SAMPLE SUMMARY

Project: Black Pine Mine (06) REV
Pace Project No.: 10166973

Lab ID	Sample ID	Matrix	Date Collected	Date Received
10166973001	**BP-RY-06-00**	Solid	08/16/11 11:10	08/18/11 09:10
10166973002	**BP-RY-06-04**	Solid	08/16/11 11:20	08/18/11 09:10
10166973003	**BP-RY-07-00**	Solid	08/17/11 08:15	08/18/11 09:10
10166973004	**BP-RY-07-10**	Solid	08/17/11 08:50	08/18/11 09:10
10166973005	**BP-RY-08-00**	Solid	08/17/11 12:10	08/18/11 09:10
10166973006	**BP-CML-RCRA-01**	Solid	08/17/11 10:00	08/18/11 09:10
10166973007	**BP-CML-RCRA-02**	Solid	08/17/11 10:45	08/18/11 09:10
10166973008	**BP-CML-RCRA-03**	Solid	08/17/11 11:04	08/18/11 09:10
10166973009	**BP-CML-RCRA-04**	Solid	08/17/11 11:34	08/18/11 09:10

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SAMPLE ANALYTE COUNT

Project: Black Pine Mine (06) REV
Pace Project No.: 10166973

Lab ID	Sample ID	Method	Analysts	Analytes Reported	Laboratory
10166973001	**BP-RY-06-00**	EPA 6020	RJS	12	PASI-M
		EPA 7471	TEM	1	PASI-M
		% Moisture	JDL	1	PASI-M
10166973002	**BP-RY-06-04**	EPA 6020	RJS	12	PASI-M
		EPA 7471	TEM	1	PASI-M
		% Moisture	JDL	1	PASI-M
10166973003	**BP-RY-07-00**	EPA 6020	RJS	12	PASI-M
		EPA 7471	TEM	1	PASI-M
		% Moisture	JDL	1	PASI-M
10166973004	**BP-RY-07-10**	EPA 6020	RJS	12	PASI-M
		EPA 7471	TEM	1	PASI-M
		% Moisture	JDL	1	PASI-M
10166973005	**BP-RY-08-00**	CLPICPAES	IP	1	PASI-M
		EPA 9081	JGP	1	PASI-K
		EPA 6020	RJS	12	PASI-M
		EPA 7471	TEM	1	PASI-M
		% Moisture	JDL	1	PASI-M
		ASA 33-3.2/EPA 353.2	CAC	1	PASI-MT
		ASTM D421	CAC	1	PASI-MT
		ASA 29-3.5.2	CAC	1	PASI-MT
		ASA 10-3.2	SR1	1	PASI-MT
		ASA 24-5.4/SM4500	SA1	1	PASI-MT
		Modified Sobek 3.2	CAC	1	PASI-MT
		Modified Sobek 3.2	CAC	5	PASI-MT
		Modified Sobek 3.2	CAC	4	PASI-MT
		Modified Sobek 3.2	CAC	1	PASI-MT
		ASA 10-3.3	SR1	1	PASI-MT
10166973006	**BP-CML-RCRA-01**	EPA 6020	RJS	6	PASI-M
		EPA 7471	TEM	1	PASI-M
		% Moisture	JDL	1	PASI-M
10166973007	**BP-CML-RCRA-02**	EPA 6020	RJS	6	PASI-M
		EPA 7471	TEM	1	PASI-M
		% Moisture	JDL	1	PASI-M
10166973008	**BP-CML-RCRA-03**	EPA 6020	RJS	6	PASI-M
		EPA 7471	TEM	1	PASI-M
		% Moisture	JDL	1	PASI-M
10166973009	**BP-CML-RCRA-04**	EPA 6020	RJS	6	PASI-M

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SAMPLE ANALYTE COUNT

Project: Black Pine Mine (06) REV
Pace Project No.: 10166973

Lab ID	Sample ID	Method	Analysts	Analytes Reported	Laboratory
		EPA 7471	TEM	1	PASI-M
		% Moisture	JDL	1	PASI-M

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PROJECT NARRATIVE

Project: Black Pine Mine (06) REV
Pace Project No.: 10166973

Method: **CLPICPAES**
Description: 6010 MET ICP, MDEQ Potassium
Client: Montana Dept. of Environmental Quality
Date: October 18, 2011

General Information:
1 sample was analyzed for CLPICPAES. All samples were received in acceptable condition with any exceptions noted below.

L2: Analyte recovery in the laboratory control sample (LCS) was below QC limits. Results may be biased low.
- BP-RY-08-00 (Lab ID: 10166973005)

Hold Time:
The samples were analyzed within the method required hold times with any exceptions noted below.

Sample Preparation:
The samples were prepared in accordance with ASA 13-3.5.2.2 with any exceptions noted below.

Initial Calibrations (including MS Tune as applicable):
All criteria were within method requirements with any exceptions noted below.

Continuing Calibration:
All criteria were within method requirements with any exceptions noted below.

Method Blank:
All analytes were below the report limit in the method blank with any exceptions noted below.

Laboratory Control Spike:
All laboratory control spike compounds were within QC limits with any exceptions noted below.

QC Batch: MPRP/28018

L0: Analyte recovery in the laboratory control sample (LCS) was outside QC limits.
- LCS (Lab ID: 1041722)
  - Potassium

Matrix Spikes:
All percent recoveries and relative percent differences (RPDs) were within acceptance criteria with any exceptions noted below.

Duplicate Sample:
All duplicate sample results were within method acceptance criteria with any exceptions noted below.

Additional Comments:

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PROJECT NARRATIVE

Project: Black Pine Mine (06) REV
Pace Project No.: 10166973

Method: **EPA 9081**
Description: Cation Exchange Capacity
Client: Montana Dept. of Environmental Quality
Date: October 18, 2011

General Information:
1 sample was analyzed for EPA 9081. All samples were received in acceptable condition with any exceptions noted below.

Hold Time:
The samples were analyzed within the method required hold times with any exceptions noted below.

Initial Calibrations (including MS Tune as applicable):
All criteria were within method requirements with any exceptions noted below.

Continuing Calibration:
All criteria were within method requirements with any exceptions noted below.

Method Blank:
All analytes were below the report limit in the method blank with any exceptions noted below.

Laboratory Control Spike:
All laboratory control spike compounds were within QC limits with any exceptions noted below.

Matrix Spikes:
All percent recoveries and relative percent differences (RPDs) were within acceptance criteria with any exceptions noted below.

Duplicate Sample:
All duplicate sample results were within method acceptance criteria with any exceptions noted below.

Additional Comments:

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PROJECT NARRATIVE

Project: Black Pine Mine (06) REV
Pace Project No.: 10166973

Method: **EPA 6020**
Description: 6020 MET ICPMS
Client: Montana Dept. of Environmental Quality
Date: October 18, 2011

General Information:
9 samples were analyzed for EPA 6020. All samples were received in acceptable condition with any exceptions noted below.

Hold Time:
The samples were analyzed within the method required hold times with any exceptions noted below.

Sample Preparation:
The samples were prepared in accordance with EPA 3050 with any exceptions noted below.

Initial Calibrations (including MS Tune as applicable):
All criteria were within method requirements with any exceptions noted below.

Continuing Calibration:
All criteria were within method requirements with any exceptions noted below.

Internal Standards:
All internal standards were within QC limits with any exceptions noted below.

Method Blank:
All analytes were below the report limit in the method blank with any exceptions noted below.

Laboratory Control Spike:
All laboratory control spike compounds were within QC limits with any exceptions noted below.

Matrix Spikes:
All percent recoveries and relative percent differences (RPDs) were within acceptance criteria with any exceptions noted below.

QC Batch: MPRP/27890

A matrix spike and matrix spike duplicate (MS/MSD) were performed on the following sample(s): 10166898013,10166973004

M6: Matrix spike and Matrix spike duplicate recovery not evaluated against control limits due to sample dilution.

- MS (Lab ID: 1037978)
  - Antimony
  - Barium
  - Chromium
  - Copper
  - Iron
  - Lead
  - Manganese
  - Nickel
  - Zinc
- MS (Lab ID: 1037980)
  - Arsenic
  - Barium
  - Cadmium

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PROJECT NARRATIVE

Project: Black Pine Mine (06) REV
Pace Project No.: 10166973

Method: **EPA 6020**
Description: 6020 MET ICPMS
Client: Montana Dept. of Environmental Quality
Date: October 18, 2011

QC Batch: MPRP/27890

A matrix spike and matrix spike duplicate (MS/MSD) were performed on the following sample(s): 10166898013,10166973004

M6: Matrix spike and Matrix spike duplicate recovery not evaluated against control limits due to sample dilution.

- Chromium
- Copper
- Iron
- Lead
- Manganese
- Nickel
- Zinc

- MSD (Lab ID: 1037979)
  - Antimony
  - Barium
  - Cadmium
  - Chromium
  - Copper
  - Iron
  - Lead
  - Manganese
  - Nickel
  - Zinc

Duplicate Sample:
All duplicate sample results were within method acceptance criteria with any exceptions noted below.

Additional Comments:

Analyte Comments:

QC Batch: MPRP/27890

E: Analyte concentration exceeded the calibration range. The reported result is estimated.

- MS (Lab ID: 1037978)
  - Manganese
  - Zinc
- MSD (Lab ID: 1037979)
  - Manganese
  - Zinc

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PROJECT NARRATIVE

Project: Black Pine Mine (06) REV
Pace Project No.: 10166973

Method: **EPA 7471**
Description: 7471 Mercury
Client: Montana Dept. of Environmental Quality
Date: October 18, 2011

General Information:
9 samples were analyzed for EPA 7471. All samples were received in acceptable condition with any exceptions noted below.

Hold Time:
The samples were analyzed within the method required hold times with any exceptions noted below.

Sample Preparation:
The samples were prepared in accordance with EPA 7471 with any exceptions noted below.

Initial Calibrations (including MS Tune as applicable):
All criteria were within method requirements with any exceptions noted below.

Continuing Calibration:
All criteria were within method requirements with any exceptions noted below.

Method Blank:
All analytes were below the report limit in the method blank with any exceptions noted below.

Laboratory Control Spike:
All laboratory control spike compounds were within QC limits with any exceptions noted below.

Matrix Spikes:
All percent recoveries and relative percent differences (RPDs) were within acceptance criteria with any exceptions noted below.

Duplicate Sample:
All duplicate sample results were within method acceptance criteria with any exceptions noted below.

Additional Comments:

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PROJECT NARRATIVE

Project: Black Pine Mine (06) REV
Pace Project No.: 10166973

Method: **ASA 33-3.2/EPA 353.2**
Description: 353.2 Nitrate + Nitrite pres.
Client: Montana Dept. of Environmental Quality
Date: October 18, 2011

General Information:
1 sample was analyzed for ASA 33-3.2/EPA 353.2. All samples were received in acceptable condition with any exceptions noted below.

Hold Time:
The samples were analyzed within the method required hold times with any exceptions noted below.

Initial Calibrations (including MS Tune as applicable):
All criteria were within method requirements with any exceptions noted below.

Continuing Calibration:
All criteria were within method requirements with any exceptions noted below.

Internal Standards:
All internal standards were within QC limits with any exceptions noted below.

Surrogates:
All surrogates were within QC limits with any exceptions noted below.

Method Blank:
All analytes were below the report limit in the method blank with any exceptions noted below.

Laboratory Control Spike:
All laboratory control spike compounds were within QC limits with any exceptions noted below.

Matrix Spikes:
All percent recoveries and relative percent differences (RPDs) were within acceptance criteria with any exceptions noted below.

Duplicate Sample:
All duplicate sample results were within method acceptance criteria with any exceptions noted below.

Additional Comments:

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PROJECT NARRATIVE

Project: Black Pine Mine (06) REV
Pace Project No.: 10166973

Method: **ASTM D421**
Description: Coarse
Client: Montana Dept. of Environmental Quality
Date: October 18, 2011

General Information:
1 sample was analyzed for ASTM D421. All samples were received in acceptable condition with any exceptions noted below.

Hold Time:
The samples were analyzed within the method required hold times with any exceptions noted below.

Initial Calibrations (including MS Tune as applicable):
All criteria were within method requirements with any exceptions noted below.

Continuing Calibration:
All criteria were within method requirements with any exceptions noted below.

Internal Standards:
All internal standards were within QC limits with any exceptions noted below.

Surrogates:
All surrogates were within QC limits with any exceptions noted below.

Method Blank:
All analytes were below the report limit in the method blank with any exceptions noted below.

Laboratory Control Spike:
All laboratory control spike compounds were within QC limits with any exceptions noted below.

Matrix Spikes:
All percent recoveries and relative percent differences (RPDs) were within acceptance criteria with any exceptions noted below.

Duplicate Sample:
All duplicate sample results were within method acceptance criteria with any exceptions noted below.

Additional Comments:

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PROJECT NARRATIVE

Project: Black Pine Mine (06) REV
Pace Project No.: 10166973

Method: **ASA 29-3.5.2**
Description: Organic Matter MT ASA 29
Client: Montana Dept. of Environmental Quality
Date: October 18, 2011

General Information:
1 sample was analyzed for ASA 29-3.5.2. All samples were received in acceptable condition with any exceptions noted below.

Hold Time:
The samples were analyzed within the method required hold times with any exceptions noted below.

Initial Calibrations (including MS Tune as applicable):
All criteria were within method requirements with any exceptions noted below.

Continuing Calibration:
All criteria were within method requirements with any exceptions noted below.

Internal Standards:
All internal standards were within QC limits with any exceptions noted below.

Surrogates:
All surrogates were within QC limits with any exceptions noted below.

Method Blank:
All analytes were below the report limit in the method blank with any exceptions noted below.

Laboratory Control Spike:
All laboratory control spike compounds were within QC limits with any exceptions noted below.

Matrix Spikes:
All percent recoveries and relative percent differences (RPDs) were within acceptance criteria with any exceptions noted below.

Duplicate Sample:
All duplicate sample results were within method acceptance criteria with any exceptions noted below.

Additional Comments:

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PROJECT NARRATIVE

Project: Black Pine Mine (06) REV
Pace Project No.: 10166973

Method: **ASA 10-3.2**
Description: ASA 10-3.2 pH
Client: Montana Dept. of Environmental Quality
Date: October 18, 2011

General Information:
1 sample was analyzed for ASA 10-3.2. All samples were received in acceptable condition with any exceptions noted below.

Hold Time:
The samples were analyzed within the method required hold times with any exceptions noted below.

Initial Calibrations (including MS Tune as applicable):
All criteria were within method requirements with any exceptions noted below.

Continuing Calibration:
All criteria were within method requirements with any exceptions noted below.

Internal Standards:
All internal standards were within QC limits with any exceptions noted below.

Surrogates:
All surrogates were within QC limits with any exceptions noted below.

Method Blank:
All analytes were below the report limit in the method blank with any exceptions noted below.

Laboratory Control Spike:
All laboratory control spike compounds were within QC limits with any exceptions noted below.

Matrix Spikes:
All percent recoveries and relative percent differences (RPDs) were within acceptance criteria with any exceptions noted below.

Duplicate Sample:
All duplicate sample results were within method acceptance criteria with any exceptions noted below.

Additional Comments:

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PROJECT NARRATIVE

Project: Black Pine Mine (06) REV
Pace Project No.: 10166973

Method: **ASA 24-5.4/SM4500**
Description: SM4500P-E, Total Phosphorus
Client: Montana Dept. of Environmental Quality
Date: October 18, 2011

General Information:
1 sample was analyzed for ASA 24-5.4/SM4500. All samples were received in acceptable condition with any exceptions noted below.

Hold Time:
The samples were analyzed within the method required hold times with any exceptions noted below.

Initial Calibrations (including MS Tune as applicable):
All criteria were within method requirements with any exceptions noted below.

Continuing Calibration:
All criteria were within method requirements with any exceptions noted below.

Internal Standards:
All internal standards were within QC limits with any exceptions noted below.

Surrogates:
All surrogates were within QC limits with any exceptions noted below.

Method Blank:
All analytes were below the report limit in the method blank with any exceptions noted below.

Laboratory Control Spike:
All laboratory control spike compounds were within QC limits with any exceptions noted below.

Matrix Spikes:
All percent recoveries and relative percent differences (RPDs) were within acceptance criteria with any exceptions noted below.

Duplicate Sample:
All duplicate sample results were within method acceptance criteria with any exceptions noted below.

Additional Comments:

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PROJECT NARRATIVE

Project: Black Pine Mine (06) REV
Pace Project No.: 10166973

Method: **Modified Sobek 3.2**
Description: Sobek Acid Base Potential
Client: Montana Dept. of Environmental Quality
Date: October 18, 2011

General Information:
1 sample was analyzed for Modified Sobek 3.2. All samples were received in acceptable condition with any exceptions noted below.

Hold Time:
The samples were analyzed within the method required hold times with any exceptions noted below.

Initial Calibrations (including MS Tune as applicable):
All criteria were within method requirements with any exceptions noted below.

Continuing Calibration:
All criteria were within method requirements with any exceptions noted below.

Internal Standards:
All internal standards were within QC limits with any exceptions noted below.

Surrogates:
All surrogates were within QC limits with any exceptions noted below.

Method Blank:
All analytes were below the report limit in the method blank with any exceptions noted below.

Laboratory Control Spike:
All laboratory control spike compounds were within QC limits with any exceptions noted below.

Matrix Spikes:
All percent recoveries and relative percent differences (RPDs) were within acceptance criteria with any exceptions noted below.

Duplicate Sample:
All duplicate sample results were within method acceptance criteria with any exceptions noted below.

Additional Comments:

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PROJECT NARRATIVE

Project: Black Pine Mine (06) REV
Pace Project No.: 10166973

Method: **Modified Sobek 3.2**
Description: Sobek Extractable Sulfur
Client: Montana Dept. of Environmental Quality
Date: October 18, 2011

General Information:
1 sample was analyzed for Modified Sobek 3.2. All samples were received in acceptable condition with any exceptions noted below.

Hold Time:
The samples were analyzed within the method required hold times with any exceptions noted below.

Initial Calibrations (including MS Tune as applicable):
All criteria were within method requirements with any exceptions noted below.

Continuing Calibration:
All criteria were within method requirements with any exceptions noted below.

Internal Standards:
All internal standards were within QC limits with any exceptions noted below.

Surrogates:
All surrogates were within QC limits with any exceptions noted below.

Method Blank:
All analytes were below the report limit in the method blank with any exceptions noted below.

Laboratory Control Spike:
All laboratory control spike compounds were within QC limits with any exceptions noted below.

Matrix Spikes:
All percent recoveries and relative percent differences (RPDs) were within acceptance criteria with any exceptions noted below.

Duplicate Sample:
All duplicate sample results were within method acceptance criteria with any exceptions noted below.

Additional Comments:

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PROJECT NARRATIVE

Project: Black Pine Mine (06) REV
Pace Project No.: 10166973

Method: **Modified Sobek 3.2**
Description: Sobek Calculations
Client: Montana Dept. of Environmental Quality
Date: October 18, 2011

General Information:
1 sample was analyzed for Modified Sobek 3.2. All samples were received in acceptable condition with any exceptions noted below.

Hold Time:
The samples were analyzed within the method required hold times with any exceptions noted below.

Initial Calibrations (including MS Tune as applicable):
All criteria were within method requirements with any exceptions noted below.

Continuing Calibration:
All criteria were within method requirements with any exceptions noted below.

Internal Standards:
All internal standards were within QC limits with any exceptions noted below.

Surrogates:
All surrogates were within QC limits with any exceptions noted below.

Method Blank:
All analytes were below the report limit in the method blank with any exceptions noted below.

Laboratory Control Spike:
All laboratory control spike compounds were within QC limits with any exceptions noted below.

Matrix Spikes:
All percent recoveries and relative percent differences (RPDs) were within acceptance criteria with any exceptions noted below.

Duplicate Sample:
All duplicate sample results were within method acceptance criteria with any exceptions noted below.

Additional Comments:

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PROJECT NARRATIVE

Project: Black Pine Mine (06) REV
Pace Project No.: 10166973

Method: **Modified Sobek 3.2**
Description: Sobek SMP Buffer pH
Client: Montana Dept. of Environmental Quality
Date: October 18, 2011

General Information:
1 sample was analyzed for Modified Sobek 3.2. All samples were received in acceptable condition with any exceptions noted below.

Hold Time:
The samples were analyzed within the method required hold times with any exceptions noted below.

Initial Calibrations (including MS Tune as applicable):
All criteria were within method requirements with any exceptions noted below.

Continuing Calibration:
All criteria were within method requirements with any exceptions noted below.

Internal Standards:
All internal standards were within QC limits with any exceptions noted below.

Surrogates:
All surrogates were within QC limits with any exceptions noted below.

Method Blank:
All analytes were below the report limit in the method blank with any exceptions noted below.

Laboratory Control Spike:
All laboratory control spike compounds were within QC limits with any exceptions noted below.

Matrix Spikes:
All percent recoveries and relative percent differences (RPDs) were within acceptance criteria with any exceptions noted below.

Duplicate Sample:
All duplicate sample results were within method acceptance criteria with any exceptions noted below.

Additional Comments:

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PROJECT NARRATIVE

Project: Black Pine Mine (06) REV
Pace Project No.: 10166973

Method: **ASA 10-3.3**
Description: ASA10-3.3 Specific Conductance
Client: Montana Dept. of Environmental Quality
Date: October 18, 2011

General Information:
1 sample was analyzed for ASA 10-3.3. All samples were received in acceptable condition with any exceptions noted below.

Hold Time:
The samples were analyzed within the method required hold times with any exceptions noted below.

Initial Calibrations (including MS Tune as applicable):
All criteria were within method requirements with any exceptions noted below.

Continuing Calibration:
All criteria were within method requirements with any exceptions noted below.

Internal Standards:
All internal standards were within QC limits with any exceptions noted below.

Surrogates:
All surrogates were within QC limits with any exceptions noted below.

Method Blank:
All analytes were below the report limit in the method blank with any exceptions noted below.

Laboratory Control Spike:
All laboratory control spike compounds were within QC limits with any exceptions noted below.

Matrix Spikes:
All percent recoveries and relative percent differences (RPDs) were within acceptance criteria with any exceptions noted below.

Duplicate Sample:
All duplicate sample results were within method acceptance criteria with any exceptions noted below.

Additional Comments:

This data package has been reviewed for quality and completeness and is approved for release.

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ANALYTICAL RESULTS

Project: Black Pine Mine (06) REV
Pace Project No.: 10166973

Sample: BP-RY-06-00 **Lab ID: 10166973001** Collected: 08/16/11 11:10 Received: 08/18/11 09:10 Matrix: Solid

Results reported on a "dry-weight" basis

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
6020 MET ICPMS	Analytical Method: EPA 6020 Preparation Method: EPA 3050							
Antimony	**5.5**	mg/kg	0.55	20	08/24/11 09:04	08/30/11 01:33	7440-36-0	
Arsenic	**13.1**	mg/kg	0.55	20	08/24/11 09:04	08/30/11 01:33	7440-38-2	
Barium	**122**	mg/kg	0.33	20	08/24/11 09:04	08/30/11 01:33	7440-39-3	
Cadmium	**0.58**	mg/kg	0.088	20	08/24/11 09:04	08/30/11 01:33	7440-43-9	
Chromium	**13.2**	mg/kg	0.55	20	08/24/11 09:04	08/30/11 01:33	7440-47-3	
Cobalt	**7.8**	mg/kg	0.55	20	08/24/11 09:04	08/30/11 01:33	7440-48-4	
Copper	**219**	mg/kg	0.55	20	08/24/11 09:04	08/30/11 01:33	7440-50-8	
Iron	**13300**	mg/kg	54.8	20	08/24/11 09:04	08/30/11 01:33	7439-89-6	
Lead	**45.6**	mg/kg	0.11	20	08/24/11 09:04	08/30/11 01:33	7439-92-1	
Manganese	**384**	mg/kg	0.55	20	08/24/11 09:04	08/30/11 01:33	7439-96-5	
Nickel	**12.3**	mg/kg	0.55	20	08/24/11 09:04	08/30/11 01:33	7440-02-0	
Zinc	**53.9**	mg/kg	5.5	20	08/24/11 09:04	08/30/11 01:33	7440-66-6	
7471 Mercury	Analytical Method: EPA 7471 Preparation Method: EPA 7471							
Mercury	**0.026**	mg/kg	0.019	1	08/23/11 14:06	08/24/11 11:18	7439-97-6	
Dry Weight	Analytical Method: % Moisture							
Percent Moisture	**8.7**	%	0.10	1		08/30/11 00:00		

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ANALYTICAL RESULTS

Project: Black Pine Mine (06) REV
Pace Project No.: 10166973

Sample: BP-RY-06-04 **Lab ID: 10166973002** Collected: 08/16/11 11:20 Received: 08/18/11 09:10 Matrix: Solid

Results reported on a "dry-weight" basis

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
6020 MET ICPMS	Analytical Method: EPA 6020 Preparation Method: EPA 3050							
Antimony	**0.86**	mg/kg	0.56	20	08/24/11 09:04	08/30/11 01:42	7440-36-0	
Arsenic	**7.9**	mg/kg	0.56	20	08/24/11 09:04	08/30/11 01:42	7440-38-2	
Barium	**105**	mg/kg	0.34	20	08/24/11 09:04	08/30/11 01:42	7440-39-3	
Cadmium	**0.46**	mg/kg	0.089	20	08/24/11 09:04	08/30/11 01:42	7440-43-9	
Chromium	**17.9**	mg/kg	0.56	20	08/24/11 09:04	08/30/11 01:42	7440-47-3	
Cobalt	**4.6**	mg/kg	0.56	20	08/24/11 09:04	08/30/11 01:42	7440-48-4	
Copper	**310**	mg/kg	0.56	20	08/24/11 09:04	08/30/11 01:42	7440-50-8	
Iron	**19300**	mg/kg	55.9	20	08/24/11 09:04	08/30/11 01:42	7439-89-6	
Lead	**11.2**	mg/kg	0.11	20	08/24/11 09:04	08/30/11 01:42	7439-92-1	
Manganese	**110**	mg/kg	0.56	20	08/24/11 09:04	08/30/11 01:42	7439-96-5	
Nickel	**15.0**	mg/kg	0.56	20	08/24/11 09:04	08/30/11 01:42	7440-02-0	
Zinc	**57.4**	mg/kg	5.6	20	08/24/11 09:04	08/30/11 01:42	7440-66-6	
7471 Mercury	Analytical Method: EPA 7471 Preparation Method: EPA 7471							
Mercury	**0.097**	mg/kg	0.020	1	08/23/11 14:06	08/24/11 11:20	7439-97-6	
Dry Weight	Analytical Method: % Moisture							
Percent Moisture	**14.9**	%	0.10	1		08/30/11 00:00		

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ANALYTICAL RESULTS

Project: Black Pine Mine (06) REV
Pace Project No.: 10166973

Sample: BP-RY-07-00 **Lab ID: 10166973003** Collected: 08/17/11 08:15 Received: 08/18/11 09:10 Matrix: Solid

Results reported on a "dry-weight" basis

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
6020 MET ICPMS	Analytical Method: EPA 6020 Preparation Method: EPA 3050							
Antimony	**0.98**	mg/kg	0.48	20	08/24/11 09:04	08/30/11 01:51	7440-36-0	
Arsenic	**7.2**	mg/kg	0.48	20	08/24/11 09:04	08/30/11 01:51	7440-38-2	
Barium	**216**	mg/kg	0.29	20	08/24/11 09:04	08/30/11 01:51	7440-39-3	
Cadmium	**0.20**	mg/kg	0.077	20	08/24/11 09:04	08/30/11 01:51	7440-43-9	
Chromium	**7.6**	mg/kg	0.48	20	08/24/11 09:04	08/30/11 01:51	7440-47-3	
Cobalt	**8.1**	mg/kg	0.48	20	08/24/11 09:04	08/30/11 01:51	7440-48-4	
Copper	**6.4**	mg/kg	0.48	20	08/24/11 09:04	08/30/11 01:51	7440-50-8	
Iron	**9880**	mg/kg	48.0	20	08/24/11 09:04	08/30/11 01:51	7439-89-6	
Lead	**13.7**	mg/kg	0.096	20	08/24/11 09:04	08/30/11 01:51	7439-92-1	
Manganese	**1840**	mg/kg	4.8	200	08/24/11 09:04	08/30/11 01:56	7439-96-5	
Nickel	**9.6**	mg/kg	0.48	20	08/24/11 09:04	08/30/11 01:51	7440-02-0	
Zinc	**32.0**	mg/kg	4.8	20	08/24/11 09:04	08/30/11 01:51	7440-66-6	
7471 Mercury	Analytical Method: EPA 7471 Preparation Method: EPA 7471							
Mercury	**0.037**	mg/kg	0.019	1	08/23/11 14:06	08/24/11 11:27	7439-97-6	
Dry Weight	Analytical Method: % Moisture							
Percent Moisture	**6.2**	%	0.10	1		08/30/11 00:00		

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ANALYTICAL RESULTS

Project: Black Pine Mine (06) REV
Pace Project No.: 10166973

Sample: BP-RY-07-10 **Lab ID: 10166973004** Collected: 08/17/11 08:50 Received: 08/18/11 09:10 Matrix: Solid

Results reported on a "dry-weight" basis

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
6020 MET ICPMS	Analytical Method: EPA 6020 Preparation Method: EPA 3050							
Antimony	**1.1**	mg/kg	0.49	20	08/24/11 09:04	08/30/11 02:01	7440-36-0	
Arsenic	**8.3**	mg/kg	0.49	20	08/24/11 09:04	08/30/11 02:01	7440-38-2	M6
Barium	**114**	mg/kg	0.29	20	08/24/11 09:04	08/30/11 02:01	7440-39-3	M6
Cadmium	**<0.078**	mg/kg	0.078	20	08/24/11 09:04	08/30/11 02:01	7440-43-9	M6
Chromium	**14.1**	mg/kg	0.49	20	08/24/11 09:04	08/30/11 02:01	7440-47-3	M6
Cobalt	**15.9**	mg/kg	0.49	20	08/24/11 09:04	08/30/11 02:01	7440-48-4	
Copper	**16.4**	mg/kg	0.49	20	08/24/11 09:04	08/30/11 02:01	7440-50-8	M6
Iron	**17300**	mg/kg	49.0	20	08/24/11 09:04	08/30/11 02:01	7439-89-6	M6
Lead	**15.8**	mg/kg	0.098	20	08/24/11 09:04	08/30/11 02:01	7439-92-1	M6
Manganese	**216**	mg/kg	0.49	20	08/24/11 09:04	08/30/11 02:01	7439-96-5	M6
Nickel	**14.9**	mg/kg	0.49	20	08/24/11 09:04	08/30/11 02:01	7440-02-0	M6
Zinc	**27.2**	mg/kg	4.9	20	08/24/11 09:04	08/30/11 02:01	7440-66-6	M6
7471 Mercury	Analytical Method: EPA 7471 Preparation Method: EPA 7471							
Mercury	**0.065**	mg/kg	0.024	1	08/23/11 14:06	08/24/11 11:29	7439-97-6	
Dry Weight	Analytical Method: % Moisture							
Percent Moisture	**15.0**	%	0.10	1		08/30/11 00:00		

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ANALYTICAL RESULTS

Project: Black Pine Mine (06) REV
Pace Project No.: 10166973

Sample: BP-RY-08-00 **Lab ID: 10166973005** Collected: 08/17/11 12:10 Received: 08/18/11 09:10 Matrix: Solid

Results reported on a "dry-weight" basis

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
6010 MET ICP, MDEQ Potassium	Analytical Method: CLPICPAES Preparation Method: ASA 13-3.5.2.2							
Potassium	**86.0**	mg/kg	26.8	1	08/30/11 08:21	08/30/11 11:47	7440-09-7	L2
Cation Exchange Capacity	Analytical Method: EPA 9081							
Cation Exchange Capacity	**11.2**	meq/100g	0.98	10	08/31/11 12:00	09/01/11 11:53		
6020 MET ICPMS	Analytical Method: EPA 6020 Preparation Method: EPA 3050							
Antimony	**19.3**	mg/kg	0.50	20	08/24/11 09:04	08/30/11 12:40	7440-36-0	
Arsenic	**52.1**	mg/kg	0.50	20	08/24/11 09:04	08/30/11 12:40	7440-38-2	
Barium	**90.2**	mg/kg	0.30	20	08/24/11 09:04	08/30/11 12:40	7440-39-3	
Cadmium	**0.35**	mg/kg	0.080	20	08/24/11 09:04	08/30/11 12:40	7440-43-9	
Chromium	**3.6**	mg/kg	0.50	20	08/24/11 09:04	08/30/11 12:40	7440-47-3	
Cobalt	**1.7**	mg/kg	0.50	20	08/24/11 09:04	08/30/11 12:40	7440-48-4	
Copper	**70.7**	mg/kg	0.50	20	08/24/11 09:04	08/30/11 12:40	7440-50-8	
Iron	**9240**	mg/kg	49.9	20	08/24/11 09:04	08/30/11 12:40	7439-89-6	
Lead	**217**	mg/kg	0.10	20	08/24/11 09:04	08/30/11 12:40	7439-92-1	
Manganese	**146**	mg/kg	0.50	20	08/24/11 09:04	08/30/11 12:40	7439-96-5	
Nickel	**4.4**	mg/kg	0.50	20	08/24/11 09:04	08/30/11 12:40	7440-02-0	
Zinc	**129**	mg/kg	5.0	20	08/24/11 09:04	08/30/11 12:40	7440-66-6	
7471 Mercury	Analytical Method: EPA 7471 Preparation Method: EPA 7471							
Mercury	**0.020**	mg/kg	0.019	1	08/23/11 14:06	08/24/11 11:31	7439-97-6	
Dry Weight	Analytical Method: % Moisture							
Percent Moisture	**8.0**	%	0.10	1		08/30/11 00:00		
353.2 Nitrate + Nitrite pres.	Analytical Method: ASA 33-3.2/EPA 353.2							
Available Nitrate	**<5.0**	mg/kg	5.0	1		08/31/11 13:26		
Coarse	Analytical Method: ASTM D421							
Coarse Fragment	**63.7**	%	0.10	1		08/23/11 00:00		
Organic Matter MT ASA 29	Analytical Method: ASA 29-3.5.2							
Organic Matter	**2.4**	% (w/w)	0.10	1		08/30/11 15:00		
ASA 10-3.2 pH	Analytical Method: ASA 10-3.2							
pH, Saturated Paste	**7.5**	Std. Units	0.10	1		08/25/11 16:05		
SM4500P-E, Total Phosphorus	Analytical Method: ASA 24-5.4/SM4500							
Available Phosphorus	**2.8**	mg/kg	1.0	1		08/24/11 15:47	7723-14-0	
Sobek Acid Base Potential	Analytical Method: Modified Sobek 3.2							
Neutralization Potential	**2.4**	tons/1000	0.50	1		08/31/11 00:00		

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ANALYTICAL RESULTS

Project: Black Pine Mine (06) REV
Pace Project No.: 10166973

Sample: BP-RY-08-00 **Lab ID: 10166973005** Collected: 08/17/11 12:10 Received: 08/18/11 09:10 Matrix: Solid

Results reported on a "dry-weight" basis

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
Sobek Extractable Sulfur	Analytical Method: Modified Sobek 3.2							
Sulfur, HCl Extractable	**<0.050**	% (w/w)	0.050	1		08/30/11 10:11		
Sulfur, HNO3 Extractable	**<0.050**	% (w/w)	0.050	1		08/30/11 10:11		
Sulfur, Hot Water Extractable	**<0.050**	% (w/w)	0.050	1		08/30/11 10:11		
Sulfur, Residual	**<0.050**	% (w/w)	0.050	1		08/30/11 10:11		
Total Sulfur	**<0.050**	% (w/w)	0.050	1		08/30/11 10:11		
Sobek Calculations	Analytical Method: Modified Sobek 3.2							
Acid/Base Potential	**2.4**	tons/1000		1		08/31/11 00:00		
Acid Potential	**<4.3**	tons/1000	4.3	1		08/31/11 00:00		
Lime Requirement	**<5.4**	tons/1000	5.4	1		08/31/11 00:00		
SMP Lime Requirement	**0**	tons/1000	0.0	1		08/31/11 00:00		
Sobek SMP Buffer pH	Analytical Method: Modified Sobek 3.2							
SMP Buffer pH	**7.0**	Std. Units	0.10	1		08/30/11 14:09		
ASA10-3.3 Specific Conductance	Analytical Method: ASA 10-3.3							
Sp.Conductance Saturated Paste	**0.27**	mmhos/cm	0.010	1		08/25/11 14:32		

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ANALYTICAL RESULTS

Project: Black Pine Mine (06) REV
Pace Project No.: 10166973

Sample: BP-CML-RCRA-01 **Lab ID: 10166973006** Collected: 08/17/11 10:00 Received: 08/18/11 09:10 Matrix: Solid

Results reported on a "dry-weight" basis

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
6020 MET ICPMS	Analytical Method: EPA 6020 Preparation Method: EPA 3050							
Arsenic	**63.3**	mg/kg	0.48	20	08/24/11 09:04	08/30/11 02:38	7440-38-2	
Barium	**197**	mg/kg	0.29	20	08/24/11 09:04	08/30/11 02:38	7440-39-3	
Cadmium	**0.62**	mg/kg	0.076	20	08/24/11 09:04	08/30/11 02:38	7440-43-9	
Chromium	**54.1**	mg/kg	0.48	20	08/24/11 09:04	08/30/11 02:38	7440-47-3	
Cobalt	**7.1**	mg/kg	0.48	20	08/24/11 09:04	08/30/11 02:38	7440-48-4	
Lead	**164**	mg/kg	0.095	20	08/24/11 09:04	08/30/11 02:38	7439-92-1	
7471 Mercury	Analytical Method: EPA 7471 Preparation Method: EPA 7471							
Mercury	**0.51**	mg/kg	0.017	1	08/23/11 14:06	08/24/11 11:33	7439-97-6	
Dry Weight	Analytical Method: % Moisture							
Percent Moisture	**0.19**	%	0.10	1		08/30/11 00:00		

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ANALYTICAL RESULTS

Project: Black Pine Mine (06) REV
Pace Project No.: 10166973

Sample: BP-CML-RCRA-02 **Lab ID: 10166973007** Collected: 08/17/11 10:45 Received: 08/18/11 09:10 Matrix: Solid

Results reported on a "dry-weight" basis

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
6020 MET ICPMS	Analytical Method: EPA 6020 Preparation Method: EPA 3050							
Arsenic	**680**	mg/kg	1.0	40	08/24/11 09:04	08/30/11 12:50	7440-38-2	
Barium	**191**	mg/kg	0.30	20	08/24/11 09:04	08/30/11 02:47	7440-39-3	
Cadmium	**14.9**	mg/kg	0.081	20	08/24/11 09:04	08/30/11 02:47	7440-43-9	
Chromium	**1.6**	mg/kg	0.51	20	08/24/11 09:04	08/30/11 02:47	7440-47-3	
Cobalt	**0.70**	mg/kg	0.51	20	08/24/11 09:04	08/30/11 02:47	7440-48-4	
Lead	**2640**	mg/kg	1.0	200	08/24/11 09:04	08/30/11 02:52	7439-92-1	
7471 Mercury	Analytical Method: EPA 7471 Preparation Method: EPA 7471							
Mercury	**5.0**	mg/kg	0.21	10	08/23/11 14:06	08/24/11 11:54	7439-97-6	
Dry Weight	Analytical Method: % Moisture							
Percent Moisture	**6.0**	%	0.10	1		08/30/11 00:00		

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ANALYTICAL RESULTS

Project: Black Pine Mine (06) REV
Pace Project No.: 10166973

Sample: BP-CML-RCRA-03 **Lab ID: 10166973008** Collected: 08/17/11 11:04 Received: 08/18/11 09:10 Matrix: Solid

Results reported on a "dry-weight" basis

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
6020 MET ICPMS	Analytical Method: EPA 6020 Preparation Method: EPA 3050							
Arsenic	**12.7**	mg/kg	0.49	20	08/24/11 09:04	08/30/11 02:56	7440-38-2	
Barium	**19.5**	mg/kg	0.29	20	08/24/11 09:04	08/30/11 02:56	7440-39-3	
Cadmium	**0.88**	mg/kg	0.078	20	08/24/11 09:04	08/30/11 02:56	7440-43-9	
Chromium	**<0.49**	mg/kg	0.49	20	08/24/11 09:04	08/30/11 02:56	7440-47-3	
Cobalt	**<0.49**	mg/kg	0.49	20	08/24/11 09:04	08/30/11 02:56	7440-48-4	
Lead	**151**	mg/kg	0.098	20	08/24/11 09:04	08/30/11 02:56	7439-92-1	
7471 Mercury	Analytical Method: EPA 7471 Preparation Method: EPA 7471							
Mercury	**4.4**	mg/kg	0.19	10	08/23/11 14:06	08/24/11 12:02	7439-97-6	
Dry Weight	Analytical Method: % Moisture							
Percent Moisture	**5.1**	%	0.10	1		08/30/11 00:00		

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ANALYTICAL RESULTS

Project: Black Pine Mine (06) REV
Pace Project No.: 10166973

Sample: BP-CML-RCRA-04 **Lab ID: 10166973009** Collected: 08/17/11 11:34 Received: 08/18/11 09:10 Matrix: Solid

Results reported on a "dry-weight" basis

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
6020 MET ICPMS	Analytical Method: EPA 6020 Preparation Method: EPA 3050							
Arsenic	**138**	mg/kg	0.37	20	08/24/11 09:04	08/30/11 03:06	7440-38-2	
Barium	**547**	mg/kg	2.2	200	08/24/11 09:04	08/30/11 03:10	7440-39-3	
Cadmium	**1.7**	mg/kg	0.060	20	08/24/11 09:04	08/30/11 03:06	7440-43-9	
Chromium	**33.0**	mg/kg	0.37	20	08/24/11 09:04	08/30/11 03:06	7440-47-3	
Cobalt	**4.8**	mg/kg	0.37	20	08/24/11 09:04	08/30/11 03:06	7440-48-4	
Lead	**222**	mg/kg	0.075	20	08/24/11 09:04	08/30/11 03:06	7439-92-1	
7471 Mercury	Analytical Method: EPA 7471 Preparation Method: EPA 7471							
Mercury	**1.7**	mg/kg	0.15	10	08/23/11 14:06	08/24/11 12:09	7439-97-6	
Dry Weight	Analytical Method: % Moisture							
Percent Moisture	**0.13**	%	0.10	1		08/30/11 00:00		

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QUALITY CONTROL DATA

Project: Black Pine Mine (06) REV
Pace Project No.: 10166973

QC Batch: MPRP/28018
QC Batch Method: ASA 13-3.5.2.2
Analysis Method: CLPICPAES
Analysis Description: CLPICPAES MET
Associated Lab Samples: 10166973005

METHOD BLANK: 1041721 Matrix: Solid
Associated Lab Samples: 10166973005

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Potassium	mg/kg	<25.0	25.0	08/30/11 11:34	

LABORATORY CONTROL SAMPLE & LCSD: 1041722 1041723

Parameter	Units	Spike Conc.	LCS Result	LCSD Result	LCS % Rec	LCSD % Rec	% Rec Limits	RPD	Max RPD	Qualifiers
Potassium	mg/kg	313	156	252	50	83	80-120	47	20	D6,L0

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QUALITY CONTROL DATA

Project: Black Pine Mine (06) REV
Pace Project No.: 10166973

QC Batch: ICP/15164
QC Batch Method: EPA 9081
Analysis Method: EPA 9081
Analysis Description: Cation Exchange Capacity
Associated Lab Samples: 10166973005

METHOD BLANK: 867215 Matrix: Solid
Associated Lab Samples: 10166973005

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Cation Exchange Capacity	meq/100g	<1.0	1.0	09/01/11 11:47	

LABORATORY CONTROL SAMPLE: 867216

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Cation Exchange Capacity	meq/100g	52.2	48.6	93	62-138	

SAMPLE DUPLICATE: 867217

Parameter	Units	10166973005 Result	Dup Result	RPD	Max RPD	Qualifiers
Cation Exchange Capacity	meq/100g	11.2	11.3	1	47	

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QUALITY CONTROL DATA

Project: Black Pine Mine (06) REV
Pace Project No.: 10166973

QC Batch: MPRP/27890 Analysis Method: EPA 6020
QC Batch Method: EPA 3050 Analysis Description: 6020 MET
Associated Lab Samples: 10166973001, 10166973002, 10166973003, 10166973004, 10166973005, 10166973006, 10166973007, 10166973008, 10166973009

METHOD BLANK: 1037976 Matrix: Solid
Associated Lab Samples: 10166973001, 10166973002, 10166973003, 10166973004, 10166973005, 10166973006, 10166973007, 10166973008, 10166973009

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Antimony	mg/kg	<0.46	0.46	08/29/11 23:37	
Arsenic	mg/kg	<0.46	0.46	08/29/11 23:37	
Barium	mg/kg	<0.28	0.28	08/29/11 23:37	
Cadmium	mg/kg	<0.073	0.073	08/29/11 23:37	
Chromium	mg/kg	<0.46	0.46	08/29/11 23:37	
Cobalt	mg/kg	<0.46	0.46	08/29/11 23:37	
Copper	mg/kg	<0.46	0.46	08/29/11 23:37	
Iron	mg/kg	<45.9	45.9	08/29/11 23:37	
Lead	mg/kg	<0.092	0.092	08/29/11 23:37	
Manganese	mg/kg	<0.46	0.46	08/29/11 23:37	
Nickel	mg/kg	<0.46	0.46	08/29/11 23:37	
Zinc	mg/kg	<4.6	4.6	08/29/11 23:37	

LABORATORY CONTROL SAMPLE: 1037977

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Antimony	mg/kg	18.3	16.9	92	75-125	
Arsenic	mg/kg	18.3	16.7	91	75-125	
Barium	mg/kg	18.3	16.6	90	75-125	
Cadmium	mg/kg	18.3	17.0	93	75-125	
Chromium	mg/kg	18.3	17.5	96	75-125	
Cobalt	mg/kg	18.3	17.2	94	75-125	
Copper	mg/kg	18.3	17.6	96	75-125	
Iron	mg/kg	229	223	97	75-125	
Lead	mg/kg	18.3	16.5	90	75-125	
Manganese	mg/kg	18.3	17.2	94	75-125	
Nickel	mg/kg	18.3	17.6	96	75-125	
Zinc	mg/kg	18.3	18.0	98	75-125	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 1037978 1037979

Parameter	Units	10166898013 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Antimony	mg/kg	1.0	17.9	17.6	11.2	11.3	57	58	75-125	.7	20	M6
Arsenic	mg/kg	4.3	17.9	17.6	24.0	26.4	110	125	75-125	10	20	
Barium	mg/kg	317	17.9	17.6	406	445	499	728	75-125	9	20	M6
Cadmium	mg/kg	10.5	17.9	17.6	31.1	35.2	115	140	75-125	13	20	M6
Chromium	mg/kg	7.9	17.9	17.6	31.0	32.5	129	139	75-125	5	20	M6

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QUALITY CONTROL DATA

Project: Black Pine Mine (06) REV
Pace Project No.: 10166973

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 1037978 1037979

Parameter	Units	10166898013 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Cobalt	mg/kg				27.9	29.6				6	20	
Copper	mg/kg	22.6	17.9	17.6	48.5	53.0	144	173	75-125	9	20	M6
Iron	mg/kg	17600	224	221	22000	22700	1930	2310	75-125	3	20	M6
Lead	mg/kg	755	17.9	17.6	678	754	-431	-4	75-125	11	20	M6
Manganese	mg/kg	2720	17.9	17.6	3150	3430	2400	4000	75-125	8	20	E,M6
Nickel	mg/kg	7.6	17.9	17.6	31.3	33.3	133	146	75-125	6	20	M6
Zinc	mg/kg	1400	17.9	17.6	1760	2020	1970	3520	75-125	14	20	E,M6

MATRIX SPIKE SAMPLE: 1037980

Parameter	Units	10166973004 Result	Spike Conc.	MS Result	MS % Rec	% Rec Limits	Qualifiers
Antimony	mg/kg	1.1	23.1	24.7	102	75-125	
Arsenic	mg/kg	8.3	23.1	42.7	149	75-125	M6
Barium	mg/kg	114	23.1	195	354	75-125	M6
Cadmium	mg/kg	<0.078	23.1	32.2	140	75-125	M6
Chromium	mg/kg	14.1	23.1	54.0	173	75-125	M6
Cobalt	mg/kg	15.9	23.1	51.3	153	75-125	
Copper	mg/kg	16.4	23.1	57.8	180	75-125	M6
Iron	mg/kg	17300	288	24800	2600	75-125	M6
Lead	mg/kg	15.8	23.1	54.4	167	75-125	M6
Manganese	mg/kg	216	23.1	290	321	75-125	M6
Nickel	mg/kg	14.9	23.1	55.8	177	75-125	M6
Zinc	mg/kg	27.2	23.1	75.7	210	75-125	M6

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QUALITY CONTROL DATA

Project: Black Pine Mine (06) REV
Pace Project No.: 10166973

QC Batch: MERP/5852 Analysis Method: EPA 7471
QC Batch Method: EPA 7471 Analysis Description: 7471 Mercury
Associated Lab Samples: 10166973001, 10166973002, 10166973003, 10166973004, 10166973005, 10166973006, 10166973007, 10166973008, 10166973009

METHOD BLANK: 1038655 Matrix: Solid
Associated Lab Samples: 10166973001, 10166973002, 10166973003, 10166973004, 10166973005, 10166973006, 10166973007, 10166973008, 10166973009

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Mercury	mg/kg	<0.017	0.017	08/24/11 11:08	

LABORATORY CONTROL SAMPLE: 1038656

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Mercury	mg/kg	.39	0.42	106	80-120	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 1038657 1038658

Parameter	Units	10166923001 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Mercury	mg/kg	0.15	.5	.46	0.64	0.61	96	99	80-120	4	20	

REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL DATA

Project: Black Pine Mine (06) REV
Pace Project No.: 10166973

QC Batch: MPRP/28093 Analysis Method: % Moisture
QC Batch Method: % Moisture Analysis Description: Dry Weight/Percent Moisture
Associated Lab Samples: 10166973001, 10166973002, 10166973003, 10166973004, 10166973005, 10166973006, 10166973007, 10166973008, 10166973009

SAMPLE DUPLICATE: 1044468

Parameter	Units	10167188001 Result	Dup Result	RPD	Max RPD	Qualifiers
Percent Moisture	%	3.1	3.1	1	30	

SAMPLE DUPLICATE: 1044469

Parameter	Units	10166973009 Result	Dup Result	RPD	Max RPD	Qualifiers
Percent Moisture	%	0.13	0.12	5	30	

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QUALITY CONTROL DATA

Project: Black Pine Mine (06) REV
Pace Project No.: 10166973

QC Batch: MT/6810 Analysis Method: ASA 33-3.2/EPA 353.2
QC Batch Method: ASA 33-3.2/EPA 353.2 Analysis Description: 353.2 Nitrate + Nitrite
Associated Lab Samples: 10166973005

METHOD BLANK: 1039873 Matrix: Solid
Associated Lab Samples: 10166973005

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Available Nitrate	mg/kg	<5.0	5.0	08/31/11 13:22	

LABORATORY CONTROL SAMPLE: 1039874

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Available Nitrate	mg/kg	25	25.8	103	76-124	

SAMPLE DUPLICATE: 1039875

Parameter	Units	10166973005 Result	Dup Result	RPD	Max RPD	Qualifiers
Available Nitrate	mg/kg	<5.0	<5.0		30	

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QUALITY CONTROL DATA

Project: Black Pine Mine (06) REV
Pace Project No.: 10166973

QC Batch: MT/6871
QC Batch Method: ASA 29-3.5.2
Analysis Method: ASA 29-3.5.2
Analysis Description: Organic Matter ASA 29
Associated Lab Samples: 10166973005

METHOD BLANK: 1044274 Matrix: Solid
Associated Lab Samples: 10166973005

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Organic Matter	% (w/w)	<0.10	0.10	08/30/11 15:00	

LABORATORY CONTROL SAMPLE: 1044275

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Organic Matter	% (w/w)	3.1	3.2	104	69-131	

SAMPLE DUPLICATE: 1044276

Parameter	Units	10166973005 Result	Dup Result	RPD	Max RPD	Qualifiers
Organic Matter	% (w/w)	2.4	2.0	20	30	

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QUALITY CONTROL DATA

Project: Black Pine Mine (06) REV
Pace Project No.: 10166973

QC Batch: MT/6804
QC Batch Method: ASA 10-3.2
Analysis Method: ASA 10-3.2
Analysis Description: ASA 10-3.2 pH saturated paste
Associated Lab Samples: 10166973005

LABORATORY CONTROL SAMPLE: 1039534

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
pH, Saturated Paste	Std. Units	7.2	7.7	107	88-112	

SAMPLE DUPLICATE: 1039535

Parameter	Units	10166973005 Result	Dup Result	RPD	Max RPD	Qualifiers
pH, Saturated Paste	Std. Units	7.5	7.5	.5	20	

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QUALITY CONTROL DATA

Project: Black Pine Mine (06) REV
Pace Project No.: 10166973

QC Batch: MT/6792
QC Batch Method: ASA 24-5.4/SM4500
Associated Lab Samples: 10166973005

Analysis Method: ASA 24-5.4/SM4500
Analysis Description: SM4500P-E, Total Phosphorus

METHOD BLANK: 1039180 Matrix: Solid
Associated Lab Samples: 10166973005

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Available Phosphorus	mg/kg	<1.0	1.0	08/24/11 15:43	

LABORATORY CONTROL SAMPLE: 1039181

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Available Phosphorus	mg/kg	9.9	9.6	97	56-144	

SAMPLE DUPLICATE: 1039182

Parameter	Units	10166332001 Result	Dup Result	RPD	Max RPD	Qualifiers
Available Phosphorus	mg/kg	4.0	3.9	.5	30	

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QUALITY CONTROL DATA

Project: Black Pine Mine (06) REV
Pace Project No.: 10166973

QC Batch: MT/6867
QC Batch Method: Modified Sobek 3.2
Analysis Method: Modified Sobek 3.2
Analysis Description: Sobek Extractable Sulfur
Associated Lab Samples: 10166973005

METHOD BLANK: 1044258 Matrix: Solid
Associated Lab Samples: 10166973005

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Sulfur, HCl Extractable	% (w/w)	<0.050	0.050	08/30/11 09:41	
Sulfur, HNO3 Extractable	% (w/w)	<0.050	0.050	08/30/11 09:41	
Sulfur, Hot Water Extractable	% (w/w)	<0.050	0.050	08/30/11 09:41	
Sulfur, Residual	% (w/w)	<0.050	0.050	08/30/11 09:41	
Total Sulfur	% (w/w)	<0.050	0.050	08/30/11 09:41	

SAMPLE DUPLICATE: 1044260

Parameter	Units	10166973005 Result	Dup Result	RPD	Max RPD	Qualifiers
Sulfur, HCl Extractable	% (w/w)	<0.050	<0.050		20	
Sulfur, HNO3 Extractable	% (w/w)	<0.050	<0.050		20	
Sulfur, Hot Water Extractable	% (w/w)	<0.050	<0.050		20	
Sulfur, Residual	% (w/w)	<0.050	<0.050		20	
Total Sulfur	% (w/w)	<0.050	<0.050			

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QUALITY CONTROL DATA

Project: Black Pine Mine (06) REV
Pace Project No.: 10166973

QC Batch: MT/6870
QC Batch Method: Modified Sobek 3.2
Analysis Method: Modified Sobek 3.2
Analysis Description: Sobek SMP Buffer pH
Associated Lab Samples: 10166973005

SAMPLE DUPLICATE: 1044273

Parameter	Units	10166973005 Result	Dup Result	RPD	Max RPD	Qualifiers
SMP Buffer pH	Std. Units	7.0	7.0	.3	20	

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QUALITY CONTROL DATA

Project: Black Pine Mine (06) REV
Pace Project No.: 10166973

QC Batch: MT/6811
QC Batch Method: ASA 10-3.3
Analysis Method: ASA 10-3.3
Analysis Description: ASA 10-3.3 Specific Conductance
Associated Lab Samples: 10166973005

METHOD BLANK: 1039876 Matrix: Water
Associated Lab Samples: 10166973005

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Sp.Conductance Saturated Paste	mmhos/cm	<0.010	0.010	08/25/11 14:32	

LABORATORY CONTROL SAMPLE: 1039877

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Sp.Conductance Saturated Paste	mmhos/cm	.85	0.94	111	77-123	

SAMPLE DUPLICATE: 1039878

Parameter	Units	10166973005 Result	Dup Result	RPD	Max RPD	Qualifiers
Sp.Conductance Saturated Paste	mmhos/cm	0.27	0.29	7	20	

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QUALIFIERS

Project: Black Pine Mine (06) REV
Pace Project No.: 10166973

DEFINITIONS

DF - Dilution Factor, if reported, represents the factor applied to the reported data due to changes in sample preparation, dilution of the sample aliquot, or moisture content.

ND - Not Detected at or above adjusted reporting limit.

J - Estimated concentration above the adjusted method detection limit and below the adjusted reporting limit.

MDL - Adjusted Method Detection Limit.

S - Surrogate

1,2-Diphenylhydrazine (8270 listed analyte) decomposes to Azobenzene.

Consistent with EPA guidelines, unrounded data are displayed and have been used to calculate % recovery and RPD values.

LCS(D) - Laboratory Control Sample (Duplicate)

MS(D) - Matrix Spike (Duplicate)

DUP - Sample Duplicate

RPD - Relative Percent Difference

NC - Not Calculable.

SG - Silica Gel - Clean-Up

U - Indicates the compound was analyzed for, but not detected.

N-Nitrosodiphenylamine decomposes and cannot be separated from Diphenylamine using Method 8270. The result reported for each analyte is a combined concentration.

LABORATORIES

PASI-K	Pace Analytical Services - Kansas City
PASI-M	Pace Analytical Services - Minneapolis
PASI-MT	Pace Analytical Services - Montana

ANALYTE QUALIFIERS

D6	The relative percent difference (RPD) between the sample and sample duplicate exceeded laboratory control limits.
E	Analyte concentration exceeded the calibration range. The reported result is estimated.
L0	Analyte recovery in the laboratory control sample (LCS) was outside QC limits.
L2	Analyte recovery in the laboratory control sample (LCS) was below QC limits. Results may be biased low.
M6	Matrix spike and Matrix spike duplicate recovery not evaluated against control limits due to sample dilution.

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QUALITY CONTROL DATA CROSS REFERENCE TABLE

Project: Black Pine Mine (06) REV
Pace Project No.: 10166973

Lab ID	Sample ID	QC Batch Method	QC Batch	Analytical Method	Analytical Batch
10166973005	**BP-RY-08-00**	ASA 13-3.5.2.2	MPRP/28018	CLPICPAES	ICP/11870
10166973005	**BP-RY-08-00**	EPA 9081	ICP/15164	EPA 9081	ICP/13201
10166973001	**BP-RY-06-00**	EPA 3050	MPRP/27890	EPA 6020	ICPM/11354
10166973002	**BP-RY-06-04**	EPA 3050	MPRP/27890	EPA 6020	ICPM/11354
10166973003	**BP-RY-07-00**	EPA 3050	MPRP/27890	EPA 6020	ICPM/11354
10166973004	**BP-RY-07-10**	EPA 3050	MPRP/27890	EPA 6020	ICPM/11354
10166973005	**BP-RY-08-00**	EPA 3050	MPRP/27890	EPA 6020	ICPM/11354
10166973006	**BP-CML-RCRA-01**	EPA 3050	MPRP/27890	EPA 6020	ICPM/11354
10166973007	**BP-CML-RCRA-02**	EPA 3050	MPRP/27890	EPA 6020	ICPM/11354
10166973008	**BP-CML-RCRA-03**	EPA 3050	MPRP/27890	EPA 6020	ICPM/11354
10166973009	**BP-CML-RCRA-04**	EPA 3050	MPRP/27890	EPA 6020	ICPM/11354
10166973001	**BP-RY-06-00**	EPA 7471	MERP/5852	EPA 7471	MERC/6658
10166973002	**BP-RY-06-04**	EPA 7471	MERP/5852	EPA 7471	MERC/6658
10166973003	**BP-RY-07-00**	EPA 7471	MERP/5852	EPA 7471	MERC/6658
10166973004	**BP-RY-07-10**	EPA 7471	MERP/5852	EPA 7471	MERC/6658
10166973005	**BP-RY-08-00**	EPA 7471	MERP/5852	EPA 7471	MERC/6658
10166973006	**BP-CML-RCRA-01**	EPA 7471	MERP/5852	EPA 7471	MERC/6658
10166973007	**BP-CML-RCRA-02**	EPA 7471	MERP/5852	EPA 7471	MERC/6658
10166973008	**BP-CML-RCRA-03**	EPA 7471	MERP/5852	EPA 7471	MERC/6658
10166973009	**BP-CML-RCRA-04**	EPA 7471	MERP/5852	EPA 7471	MERC/6658
10166973001	**BP-RY-06-00**	% Moisture	MPRP/28093		
10166973002	**BP-RY-06-04**	% Moisture	MPRP/28093		
10166973003	**BP-RY-07-00**	% Moisture	MPRP/28093		
10166973004	**BP-RY-07-10**	% Moisture	MPRP/28093		
10166973005	**BP-RY-08-00**	% Moisture	MPRP/28093		
10166973006	**BP-CML-RCRA-01**	% Moisture	MPRP/28093		
10166973007	**BP-CML-RCRA-02**	% Moisture	MPRP/28093		
10166973008	**BP-CML-RCRA-03**	% Moisture	MPRP/28093		
10166973009	**BP-CML-RCRA-04**	% Moisture	MPRP/28093		
10166973005	**BP-RY-08-00**	ASA 33-3.2/EPA 353.2	MT/6810		
10166973005	**BP-RY-08-00**	ASTM D421	MT/6779		
10166973005	**BP-RY-08-00**	ASA 29-3.5.2	MT/6871		
10166973005	**BP-RY-08-00**	ASA 10-3.2	MT/6804		
10166973005	**BP-RY-08-00**	ASA 24-5.4/SM4500	MT/6792		
10166973005	**BP-RY-08-00**	Modified Sobek 3.2	MT/6869		
10166973005	**BP-RY-08-00**	Modified Sobek 3.2	MT/6867		
10166973005	**BP-RY-08-00**	Modified Sobek 3.2	MT/6868		
10166973005	**BP-RY-08-00**	Modified Sobek 3.2	MT/6870		
10166973005	**BP-RY-08-00**	ASA 10-3.3	MT/6811		

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CHAIN-OF-CUSTODY / Analytical Request Document

The Chain-of-Custody is a LEGAL DOCUMENT. All relevant fields must be completed accurately.

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10166973

Page: 1 of 1

1509805

Section A Required Client Information:	Section B Required Project Information:	Section C Invoice Information:
Company: HERRERA	Report To: KEVIN HOUCK	Attention: DEVIN CLARY
Address: 101 E Broadway S. Ste 411 Missoula MT 59802	Copy To: DEVIN CLARY / MARK DONNER	Company Name:
		Address:
Email To: khouck@herrerainc.com	Purchase Order No.:	Pace Quote Reference:
Phone: 406-721-4204 Fax:	Project Name: BLACK PINE MINE	Pace Project Manager:
Requested Due Date/TAT: STANDARD TAT	Project Number: 06-	Pace Profile #:

REGULATORY AGENCY: ☐ NPDES ☐ GROUND WATER ☐ DRINKING WATER ☐ UST ☐ RCRA ☐ OTHER

Site Location STATE: MT

Section D Required Client Information

SAMPLE ID
(A-Z, 0-9 / ,-)
Sample IDs MUST BE UNIQUE

Matrix Codes (MATRIX / CODE): Drinking Water DW; Water WT; Waste Water WW; Product P; Soil/Solid SL; Oil OL; Wipe WP; Air AR; Tissue TS; Other OT

ITEM #	SAMPLE ID	MATRIX CODE (see valid codes to left)	SAMPLE TYPE (G=GRAB C=COMP)	COLLECTED: COMPOSITE START DATE	COMPOSITE START TIME	COMPOSITE END/GRAB DATE	COMPOSITE END/GRAB TIME	SAMPLE TEMP AT COLLECTION	# OF CONTAINERS	Preservatives: Unpreserved	H_2SO_4	HNO_3	HCl	NaOH	$Na_2S_2O_3$	Methanol	Other	Analysis Test Y/N	Total Recov. Metals (Method 6020/7471)	Asbestos	RCRA	Residual Chlorine (Y/N)	Pace Project No./ Lab I.D.
1	BP-RY-06-00	SL	G			8-16-11	1110		1	X									X					001
2	BP-RY-06-04	SL	G			8-16-11	1120		1	X									X					002
3	BP-RY-07-00	SL	G			8-17-11	0815		1	X									X					003
4	BP-RY-07-10	SL	G			8-17-11	0850		1	X									X					004
5	BP-RY-08-00	SL	G			8-17-11	1210		2	X									X		X			005
6																							BH	
7	BP-CML-RCRA-01	SL	C			8-17-11	10:00		1	X												X		006
8	BP-CML-RCRA-02	SL	C			8-17-11	10:45		1	X												X		007
9	BP-CML-RCRA-03	SL	C			8-17-11	11:04		1	X												X		008
10	BP-CML-RCRA-04	SL	C			8-17-11	11:34		1	X												X		009
11																								
12																								

ADDITIONAL COMMENTS	RELINQUISHED BY / AFFILIATION	DATE	TIME	ACCEPTED BY / AFFILIATION	DATE	TIME	SAMPLE CONDITIONS
	[signature] / HERRERA	8-17-11	1437				Fedex - express
	[signature]	8-17-11	1437	Dan Singer [signature]	8-18-11	0910	
				Rory Vandepitte			5.9° ICE
							N/A N N Y

SAMPLER NAME AND SIGNATURE

PRINT Name of SAMPLER: BRADY HANSON

SIGNATURE of SAMPLER: [signature] DATE Signed (MM/DD/YY): 08/17/11

Temp in °C | Received on Ice (Y/N) | Custody Sealed Cooler (Y/N) | Samples Intact (Y/N)

*Important Note: By signing this form you are accepting Pace's NET 30 day payment terms and agreeing to late charges of 1.5% per month for any invoices not paid within 30 days.

Sample Condition Upon Receipt

Pace Analytical

Client Name: Herrera - MDEQ Project # 10166973

Courier: ☒ Fed Ex ☐ UPS ☐ USPS ☐ Client ☐ Commercial ☒ Pace Other _____

Tracking #: 5665 4819 Ray Picked up from Energy.

Custody Seal on Cooler/Box Present: ☒ yes ☐ no Seals intact: ☒ yes ☐ no

Packing Material: ☐ Bubble Wrap ☒ Bubble Bags ☐ None ☐ Other _____ Temp Blank: Yes X No _____

Thermometer Used: 1383045 or 135 Type of Ice: (Wet) Blue None ☒ Samples on ice, cooling process has begun

Cooler Temperature: 5.9 Biological Tissue is Frozen: Yes No

Date and Initials of person examining contents: RWW 8/19/14

Temp should be above freezing to 6°C

Comments:

Chain of Custody Present:	☒Yes ☐No ☐N/A	1.
Chain of Custody Filled Out:	☒Yes ☐No ☐N/A	2.
Chain of Custody Relinquished:	☒Yes ☐No ☐N/A	3.
Sampler Name & Signature on COC:	☒Yes ☐No ☐N/A	4.
Samples Arrived within Hold Time:	☒Yes ☐No ☐N/A	5.
Short Hold Time Analysis (<72hr):	☐Yes ☒No ☐N/A	6.
Rush Turn Around Time Requested:	☐Yes ☒No ☐N/A	7.
Sufficient Volume:	☒Yes ☐No ☐N/A	8.
Correct Containers Used:	☒Yes ☐No ☐N/A	9. PB
-Pace Containers Used:	☐Yes ☒No ☐N/A	
Containers Intact:	☒Yes ☐No ☐N/A	10.
Filtered volume received for Dissolved tests	☐Yes ☐No ☒N/A	11.
Sample Labels match COC:	☒Yes ☐No ☐N/A	12.
-Includes date/time/ID/Analysis Matrix: SL		
All containers needing acid/base preservation have been checked. Noncompliance are noted in 13.	☐Yes ☐No ☒N/A	13. ☐ HNO3 ☐ H2SO4 ☐ NaOH ☐ HCl Samp #
All containers needing preservation are found to be in compliance with EPA recommendation.	☐Yes ☐No ☒N/A	
Exceptions: VOA,Coliform, TOC, Oil and Grease, WI-DRO (water)	☐Yes ☒No	Initial when completed / Lot # of added preservative
Samples checked for dechlorination:	☐Yes ☐No ☒N/A	14.
Headspace in VOA Vials (>6mm):	☐Yes ☐No ☒N/A	15.
Trip Blank Present:	☐Yes ☒No ☐N/A	16.
Trip Blank Custody Seals Present	☐Yes ☐No ☒N/A	
Pace Trip Blank Lot # (if purchased): N/A		

Client Notification/ Resolution: Field Data Required? Y / N

Person Contacted: _____ Date/Time: _____

Comments/ Resolution: _____

Project Manager Review: [signature] **Date:** 8/19/14

Note: Whenever there is a discrepancy affecting North Carolina compliance samples, a copy of this form will be sent to the North Carolina DEHNR Certification Office (i.e out of hold, incorrect preservative, out of temp, incorrect containers)

Pace Analytical Services, Inc.
602 S 25th Street
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(406)254-7226

October 18, 2011

Kevin Houck
Herrera Environmental Consultants
101 East Broadway, Suite 610
Missoula, MT 59802

RE: Project: Black Pine Mine REV
Pace Project No.: 10167132

Dear Kevin Houck:
Enclosed are the analytical results for sample(s) received by the laboratory on August 20, 2011. The results relate only to the samples included in this report.

This report has been revised to add Cobalt and delete Silver.

If you have any questions concerning this report, please feel free to contact me.

Sincerely,

Shawn Davis for
Sally Heinje
sally.heinje@pacelabs.com
Project Manager

Enclosures

cc: Devin Clary, Montana Dept. of Environmental Quality
Mark Donner, Trihydro
Jamie Mongoven, Montana Dept. of Environmental

REPORT OF LABORATORY ANALYSIS

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CERTIFICATIONS

Project: Black Pine Mine REV
Pace Project No.: 10167132

Minnesota Certification IDs

1700 Elm Street SE Suite 200, Minneapolis, MN 55414
A2LA Certification #: 2926.01
Alaska Certification #: UST-078
Alaska Certification #MN00064
Arizona Certification #: AZ-0014
Arkansas Certification #: 88-0680
California Certification #: 01155CA
EPA Region 8 Certification #: Pace
Florida/NELAP Certification #: E87605
Georgia Certification #: 959
Idaho Certification #: MN00064
Illinois Certification #: 200011
Iowa Certification #: 368
Kansas Certification #: E-10167
Louisiana Certification #: 03086
Louisiana Certification #: LA080009
Maine Certification #: 2007029
Maryland Certification #: 322
Michigan DEQ Certification #: 9909
Minnesota Certification #: 027-053-137
Mississippi Certification #: Pace
Montana Certification #: MT CERT0092
Nevada Certification #: MN_00064
Nebraska Certification #: Pace
New Jersey Certification #: MN-002
New Mexico Certification #: Pace
New York Certification #: 11647
North Carolina Certification #: 530
North Dakota Certification #: R-036
North Dakota Certification #: R-036A
Ohio VAP Certification #: CL101
Oklahoma Certification #: D9921
Oklahoma Certification #: 9507
Oregon Certification #: MN200001
Pennsylvania Certification #: 68-00563
Puerto Rico Certification
Tennessee Certification #: 02818
Texas Certification #: T104704192
Washington Certification #: C754
Wisconsin Certification #: 999407970

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SAMPLE SUMMARY

Project: Black Pine Mine REV
Pace Project No.: 10167132

Lab ID	Sample ID	Matrix	Date Collected	Date Received
10167132001	**BP-CMN-SS-17**	Solid	08/18/11 10:00	08/20/11 09:25
10167132002	**BP-CMN-SS-18**	Solid	08/18/11 10:10	08/20/11 09:25
10167132003	**BP-CMN-SS-19**	Solid	08/18/11 10:50	08/20/11 09:25

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SAMPLE ANALYTE COUNT

Project: Black Pine Mine REV
Pace Project No.: 10167132

Lab ID	Sample ID	Method	Analysts	Analytes Reported	Laboratory
10167132001	**BP-CMN-SS-17**	EPA 6020	TL1	13	PASI-M
		EPA 7471	TEM	1	PASI-M
		% Moisture	JDL	1	PASI-M
10167132002	**BP-CMN-SS-18**	EPA 6020	TL1	12	PASI-M
		EPA 7471	TEM	1	PASI-M
		% Moisture	JDL	1	PASI-M
10167132003	**BP-CMN-SS-19**	EPA 6020	TL1	12	PASI-M
		EPA 7471	TEM	1	PASI-M
		% Moisture	JDL	1	PASI-M

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PROJECT NARRATIVE

Project: Black Pine Mine REV
Pace Project No.: 10167132

Method: **EPA 6020**
Description: 6020 MET ICPMS
Client: Montana Dept. of Environmental Quality
Date: October 18, 2011

General Information:
3 samples were analyzed for EPA 6020. All samples were received in acceptable condition with any exceptions noted below.

Hold Time:
The samples were analyzed within the method required hold times with any exceptions noted below.

Sample Preparation:
The samples were prepared in accordance with EPA 3050 with any exceptions noted below.

Initial Calibrations (including MS Tune as applicable):
All criteria were within method requirements with any exceptions noted below.

Continuing Calibration:
All criteria were within method requirements with any exceptions noted below.

Internal Standards:
All internal standards were within QC limits with any exceptions noted below.

Method Blank:
All analytes were below the report limit in the method blank with any exceptions noted below.

Laboratory Control Spike:
All laboratory control spike compounds were within QC limits with any exceptions noted below.

Matrix Spikes:
All percent recoveries and relative percent differences (RPDs) were within acceptance criteria with any exceptions noted below.

QC Batch: MPRP/28161

A matrix spike and matrix spike duplicate (MS/MSD) were performed on the following sample(s): 10167132001,10167959003

M6: Matrix spike and Matrix spike duplicate recovery not evaluated against control limits due to sample dilution.

- MS (Lab ID: 1046370)
  - Antimony
  - Arsenic
  - Barium
  - Copper
  - Iron
  - Lead
  - Manganese
  - Zinc
- MS (Lab ID: 1046372)
  - Antimony
  - Barium
  - Iron
  - Zinc

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PROJECT NARRATIVE

Project: Black Pine Mine REV
Pace Project No.: 10167132

Method: **EPA 6020**
Description: 6020 MET ICPMS
Client: Montana Dept. of Environmental Quality
Date: October 18, 2011

QC Batch: MPRP/28161

A matrix spike and matrix spike duplicate (MS/MSD) were performed on the following sample(s): 10167132001,10167959003

M6: Matrix spike and Matrix spike duplicate recovery not evaluated against control limits due to sample dilution.

- MSD (Lab ID: 1046371)
  - Barium
  - Copper
  - Iron
  - Lead
  - Manganese
  - Zinc

Duplicate Sample:
All duplicate sample results were within method acceptance criteria with any exceptions noted below.

Additional Comments:

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PROJECT NARRATIVE

Project: Black Pine Mine REV
Pace Project No.: 10167132

Method: **EPA 7471**
Description: 7471 Mercury
Client: Montana Dept. of Environmental Quality
Date: October 18, 2011

General Information:
3 samples were analyzed for EPA 7471. All samples were received in acceptable condition with any exceptions noted below.

Hold Time:
The samples were analyzed within the method required hold times with any exceptions noted below.

Sample Preparation:
The samples were prepared in accordance with EPA 7471 with any exceptions noted below.

Initial Calibrations (including MS Tune as applicable):
All criteria were within method requirements with any exceptions noted below.

Continuing Calibration:
All criteria were within method requirements with any exceptions noted below.

Method Blank:
All analytes were below the report limit in the method blank with any exceptions noted below.

Laboratory Control Spike:
All laboratory control spike compounds were within QC limits with any exceptions noted below.

Matrix Spikes:
All percent recoveries and relative percent differences (RPDs) were within acceptance criteria with any exceptions noted below.

Duplicate Sample:
All duplicate sample results were within method acceptance criteria with any exceptions noted below.

Additional Comments:

This data package has been reviewed for quality and completeness and is approved for release.

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ANALYTICAL RESULTS

Project: Black Pine Mine REV
Pace Project No.: 10167132

Sample: BP-CMN-SS-17 **Lab ID: 10167132001** Collected: 08/18/11 10:00 Received: 08/20/11 09:25 Matrix: Solid

Results reported on a "wet-weight" basis

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
6020 MET ICPMS	Analytical Method: EPA 6020 Preparation Method: EPA 3050							
Antimony	**12.6**	mg/kg	0.38	20	09/06/11 13:26	09/07/11 21:16	7440-36-0	M6
Arsenic	**14.5**	mg/kg	0.38	20	09/06/11 13:26	09/07/11 21:16	7440-38-2	M6
Barium	**120**	mg/kg	0.23	20	09/06/11 13:26	09/08/11 17:37	7440-39-3	M6
Cadmium	**0.86**	mg/kg	0.062	20	09/06/11 13:26	09/07/11 21:16	7440-43-9	
Chromium	**2.4**	mg/kg	0.38	20	09/06/11 13:26	09/07/11 21:16	7440-47-3	
Cobalt	**4.2**	mg/kg	0.38	20	09/06/11 13:26	09/07/11 21:16	7440-48-4	
Copper	**89.8**	mg/kg	0.38	20	09/06/11 13:26	09/07/11 21:16	7440-50-8	M6
Iron	**5160**	mg/kg	38.5	20	09/06/11 13:26	09/07/11 21:16	7439-89-6	M6
Lead	**90.4**	mg/kg	0.077	20	09/06/11 13:26	09/07/11 21:16	7439-92-1	M6
Manganese	**285**	mg/kg	0.38	20	09/06/11 13:26	09/07/11 21:16	7439-96-5	M6
Nickel	**3.2**	mg/kg	0.38	20	09/06/11 13:26	09/07/11 21:16	7440-02-0	
Selenium	**<0.38**	mg/kg	0.38	20	09/06/11 13:26	09/07/11 21:16	7782-49-2	
Zinc	**79.4**	mg/kg	3.8	20	09/06/11 13:26	09/08/11 17:37	7440-66-6	M6
7471 Mercury	Analytical Method: EPA 7471 Preparation Method: EPA 7471							
Mercury	**0.041**	mg/kg	0.018	1	09/01/11 10:11	09/02/11 12:09	7439-97-6	
Dry Weight	Analytical Method: % Moisture							
Percent Moisture	**13.1**	%	0.10	1		09/02/11 00:00		

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ANALYTICAL RESULTS

Project: Black Pine Mine REV
Pace Project No.: 10167132

Sample: BP-CMN-SS-18 **Lab ID: 10167132002** Collected: 08/18/11 10:10 Received: 08/20/11 09:25 Matrix: Solid

Results reported on a "wet-weight" basis

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
6020 MET ICPMS	Analytical Method: EPA 6020 Preparation Method: EPA 3050							
Antimony	**3.6**	mg/kg	0.43	20	09/06/11 13:26	09/07/11 21:24	7440-36-0	
Arsenic	**9.1**	mg/kg	0.43	20	09/06/11 13:26	09/07/11 21:24	7440-38-2	
Barium	**70.1**	mg/kg	0.26	20	09/06/11 13:26	09/08/11 17:41	7440-39-3	
Cadmium	**1.3**	mg/kg	0.068	20	09/06/11 13:26	09/07/11 21:24	7440-43-9	
Chromium	**1.2**	mg/kg	0.43	20	09/06/11 13:26	09/07/11 21:24	7440-47-3	
Cobalt	**2.9**	mg/kg	0.43	20	09/06/11 13:26	09/07/11 21:24	7440-48-4	
Copper	**62.8**	mg/kg	0.43	20	09/06/11 13:26	09/07/11 21:24	7440-50-8	
Iron	**6770**	mg/kg	42.6	20	09/06/11 13:26	09/07/11 21:24	7439-89-6	
Lead	**23.0**	mg/kg	0.085	20	09/06/11 13:26	09/07/11 21:24	7439-92-1	
Manganese	**202**	mg/kg	0.43	20	09/06/11 13:26	09/07/11 21:24	7439-96-5	
Nickel	**4.0**	mg/kg	0.43	20	09/06/11 13:26	09/07/11 21:24	7440-02-0	
Zinc	**75.5**	mg/kg	4.3	20	09/06/11 13:26	09/08/11 17:41	7440-66-6	
7471 Mercury	Analytical Method: EPA 7471 Preparation Method: EPA 7471							
Mercury	**0.022**	mg/kg	0.018	1	09/01/11 10:11	09/02/11 12:11	7439-97-6	
Dry Weight	Analytical Method: % Moisture							
Percent Moisture	**9.4**	%	0.10	1		09/02/11 00:00		

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ANALYTICAL RESULTS

Project: Black Pine Mine REV
Pace Project No.: 10167132

Sample: BP-CMN-SS-19 **Lab ID: 10167132003** Collected: 08/18/11 10:50 Received: 08/20/11 09:25 Matrix: Solid

Results reported on a "wet-weight" basis

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
6020 MET ICPMS	Analytical Method: EPA 6020 Preparation Method: EPA 3050							
Antimony	**1010**	mg/kg	1.9	100	09/06/11 13:26	09/07/11 21:35	7440-36-0	
Arsenic	**537**	mg/kg	1.9	100	09/06/11 13:26	09/07/11 21:35	7440-38-2	
Barium	**87.7**	mg/kg	1.2	100	09/06/11 13:26	09/07/11 21:35	7440-39-3	
Cadmium	**67.0**	mg/kg	0.062	20	09/06/11 13:26	09/07/11 21:31	7440-43-9	
Chromium	**<0.38**	mg/kg	0.38	20	09/06/11 13:26	09/07/11 21:31	7440-47-3	
Cobalt	**4.1**	mg/kg	0.38	20	09/06/11 13:26	09/07/11 21:31	7440-48-4	
Copper	**56800**	mg/kg	76.9	4000	09/06/11 13:26	09/08/11 17:48	7440-50-8	
Iron	**13600**	mg/kg	38.5	20	09/06/11 13:26	09/07/11 21:31	7439-89-6	
Lead	**1860**	mg/kg	1.5	400	09/06/11 13:26	09/08/11 17:45	7439-92-1	
Manganese	**989**	mg/kg	1.9	100	09/06/11 13:26	09/07/11 21:35	7439-96-5	
Nickel	**6.8**	mg/kg	0.38	20	09/06/11 13:26	09/07/11 21:31	7440-02-0	
Zinc	**4380**	mg/kg	76.9	400	09/06/11 13:26	09/08/11 17:45	7440-66-6	
7471 Mercury	Analytical Method: EPA 7471 Preparation Method: EPA 7471							
Mercury	**1.1**	mg/kg	0.019	1	09/01/11 10:11	09/02/11 12:13	7439-97-6	
Dry Weight	Analytical Method: % Moisture							
Percent Moisture	**8.5**	%	0.10	1		09/02/11 00:00		

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QUALITY CONTROL DATA

Project: Black Pine Mine REV
Pace Project No.: 10167132

QC Batch: MPRP/28161 Analysis Method: EPA 6020
QC Batch Method: EPA 3050 Analysis Description: 6020 MET
Associated Lab Samples: 10167132001, 10167132002, 10167132003

METHOD BLANK: 1046368 Matrix: Solid
Associated Lab Samples: 10167132001, 10167132002, 10167132003

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Antimony	mg/kg	<0.025	0.025	09/07/11 21:12	
Arsenic	mg/kg	<0.025	0.025	09/07/11 21:12	
Barium	mg/kg	<0.015	0.015	09/07/11 21:12	
Cadmium	mg/kg	<0.0040	0.0040	09/07/11 21:12	
Chromium	mg/kg	<0.025	0.025	09/07/11 21:12	
Cobalt	mg/kg	<0.025	0.025	09/07/11 21:12	
Copper	mg/kg	<0.025	0.025	09/07/11 21:12	
Iron	mg/kg	<2.5	2.5	09/07/11 21:12	
Lead	mg/kg	<0.0050	0.0050	09/07/11 21:12	
Manganese	mg/kg	<0.025	0.025	09/07/11 21:12	
Nickel	mg/kg	<0.025	0.025	09/07/11 21:12	
Selenium	mg/kg	<0.025	0.025	09/07/11 21:12	
Zinc	mg/kg	<0.25	0.25	09/07/11 21:12	

LABORATORY CONTROL SAMPLE: 1046369

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Antimony	mg/kg	18.2	18.8	104	75-125	
Arsenic	mg/kg	18.2	18.5	102	75-125	
Barium	mg/kg	18.2	16.8	92	75-125	
Cadmium	mg/kg	18.2	16.7	92	75-125	
Chromium	mg/kg	18.2	17.8	98	75-125	
Cobalt	mg/kg	18.2	18.0	99	75-125	
Copper	mg/kg	18.2	20.4	112	75-125	
Iron	mg/kg	227	236	104	75-125	
Lead	mg/kg	18.2	17.3	95	75-125	
Manganese	mg/kg	18.2	17.4	96	75-125	
Nickel	mg/kg	18.2	17.8	98	75-125	
Selenium	mg/kg	18.2	19.8	109	75-125	
Zinc	mg/kg	18.2	17.4	96	75-125	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 1046370 1046371

Parameter	Units	10167132001 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Antimony	mg/kg	12.6	17.3	17	24.3	27.5	56	76	75-125	13	20	M6
Arsenic	mg/kg	14.5	17.3	17	27.3	32.4	61	92	75-125	17	20	M6
Barium	mg/kg	120	17.3	17	149	116	61	-130	75-125	25	20	D6,M6
Cadmium	mg/kg	0.86	17.3	17	15.3	16.8	83	93	75-125	9	20	
Chromium	mg/kg	2.4	17.3	17	19.2	19.6	95	99	75-125	2	20	

REPORT OF LABORATORY ANALYSIS

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(406)254-7226

QUALITY CONTROL DATA

Project: Black Pine Mine REV
Pace Project No.: 10167132

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 1046370 1046371

Parameter	Units	10167132001 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Cobalt	mg/kg	4.2	17.3	17	18.7	18.8	80	82	75-125	.7	20	
Copper	mg/kg	89.8	17.3	17	92.3	103	-64	.1	75-125	11	20	M6
Iron	mg/kg	5160	216	213	4830	4950	-513	-465	75-125	2	20	M6
Lead	mg/kg	90.4	17.3	17	111	109	37	28	75-125	2	20	M6
Manganese	mg/kg	285	17.3	17	397	231	402	-568	75-125	53	20	D6,M6
Nickel	mg/kg	3.2	17.3	17	18.5	19.7	85	94	75-125	6	20	
Selenium	mg/kg	<0.38	17.3	17	16.8	18.0	95	104	75-125	7	20	
Zinc	mg/kg	79.4	17.3	17	90.0	93.2	-8	11	75-125	3	20	M6

MATRIX SPIKE SAMPLE: 1046372

Parameter	Units	10167959003 Result	Spike Conc.	MS Result	MS % Rec	% Rec Limits	Qualifiers
Antimony	mg/kg	0.23J	21.3	8.5	38	75-125	M6
Arsenic	mg/kg	8.3	21.3	30.0	98	75-125	
Barium	mg/kg	262	21.3	341	251	75-125	M6
Cadmium	mg/kg	0.26	21.3	19.1	88	75-125	
Chromium	mg/kg	26.4	21.3	48.8	93	75-125	
Cobalt	mg/kg		21.3	29.1	101	75-125	
Copper	mg/kg	18.9	21.3	42.1	101	75-125	
Iron	mg/kg	19900	267	27000	1940	75-125	M6
Lead	mg/kg	11.2	21.3	30.9	87	75-125	
Manganese	mg/kg	332	21.3	390	122	75-125	
Nickel	mg/kg	20.1	21.3	43.9	103	75-125	
Selenium	mg/kg	1.1	21.3	20.6	91	75-125	
Zinc	mg/kg	62.0	21.3	94.9	127	75-125	M6

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QUALITY CONTROL DATA

Project: Black Pine Mine REV
Pace Project No.: 10167132

QC Batch: MERP/5886 Analysis Method: EPA 7471
QC Batch Method: EPA 7471 Analysis Description: 7471 Mercury
Associated Lab Samples: 10167132001, 10167132002, 10167132003

METHOD BLANK: 1042081 Matrix: Solid
Associated Lab Samples: 10167132001, 10167132002, 10167132003

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Mercury	mg/kg	<0.019	0.019	09/02/11 11:24	

LABORATORY CONTROL SAMPLE: 1042082

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Mercury	mg/kg	.5	0.51	101	80-120	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 1042083 1042084

Parameter	Units	10167352031 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Mercury	mg/kg	0.17	.44	.45	0.62	0.63	102	102	80-120	2	20	

MATRIX SPIKE SAMPLE: 1042085

Parameter	Units	10167633001 Result	Spike Conc.	MS Result	MS % Rec	% Rec Limits	Qualifiers
Mercury	mg/kg	0.029	.6	0.61	97	80-120	

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QUALITY CONTROL DATA

Project: Black Pine Mine REV
Pace Project No.: 10167132

QC Batch: MPRP/28202 Analysis Method: % Moisture
QC Batch Method: % Moisture Analysis Description: Dry Weight/Percent Moisture
Associated Lab Samples: 10167132001, 10167132002, 10167132003

SAMPLE DUPLICATE: 1047722

Parameter	Units	10167441004 Result	Dup Result	RPD	Max RPD	Qualifiers
Percent Moisture	%	14.5	14.9	3	30	

SAMPLE DUPLICATE: 1047723

Parameter	Units	10167644011 Result	Dup Result	RPD	Max RPD	Qualifiers
Percent Moisture	%	7.3	7.1	3	30	

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QUALIFIERS

Project: Black Pine Mine REV
Pace Project No.: 10167132

DEFINITIONS

DF - Dilution Factor, if reported, represents the factor applied to the reported data due to changes in sample preparation, dilution of the sample aliquot, or moisture content.

ND - Not Detected at or above adjusted reporting limit.

J - Estimated concentration above the adjusted method detection limit and below the adjusted reporting limit.

MDL - Adjusted Method Detection Limit.

S - Surrogate

1,2-Diphenylhydrazine (8270 listed analyte) decomposes to Azobenzene.

Consistent with EPA guidelines, unrounded data are displayed and have been used to calculate % recovery and RPD values.

LCS(D) - Laboratory Control Sample (Duplicate)

MS(D) - Matrix Spike (Duplicate)

DUP - Sample Duplicate

RPD - Relative Percent Difference

NC - Not Calculable.

SG - Silica Gel - Clean-Up

U - Indicates the compound was analyzed for, but not detected.

N-Nitrosodiphenylamine decomposes and cannot be separated from Diphenylamine using Method 8270. The result reported for each analyte is a combined concentration.

LABORATORIES

PASI-M	Pace Analytical Services - Minneapolis

ANALYTE QUALIFIERS

D6	The relative percent difference (RPD) between the sample and sample duplicate exceeded laboratory control limits.
M6	Matrix spike and Matrix spike duplicate recovery not evaluated against control limits due to sample dilution.

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QUALITY CONTROL DATA CROSS REFERENCE TABLE

Project: Black Pine Mine REV
Pace Project No.: 10167132

Lab ID	Sample ID	QC Batch Method	QC Batch	Analytical Method	Analytical Batch
10167132001	**BP-CMN-SS-17**	EPA 3050	MPRP/28161	EPA 6020	ICPM/11420
10167132002	**BP-CMN-SS-18**	EPA 3050	MPRP/28161	EPA 6020	ICPM/11420
10167132003	**BP-CMN-SS-19**	EPA 3050	MPRP/28161	EPA 6020	ICPM/11420
10167132001	**BP-CMN-SS-17**	EPA 7471	MERP/5886	EPA 7471	MERC/6712
10167132002	**BP-CMN-SS-18**	EPA 7471	MERP/5886	EPA 7471	MERC/6712
10167132003	**BP-CMN-SS-19**	EPA 7471	MERP/5886	EPA 7471	MERC/6712
10167132001	**BP-CMN-SS-17**	% Moisture	MPRP/28202		
10167132002	**BP-CMN-SS-18**	% Moisture	MPRP/28202		
10167132003	**BP-CMN-SS-19**	% Moisture	MPRP/28202		

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10167132

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CHAIN-OF-CUSTODY / Analytical Request Document

The Chain-of-Custody is a LEGAL DOCUMENT. All relevant fields must be completed accurately.

10167132

Page: of 1509806

Section A Required Client Information:

Company: HERRERA
Address: 101 E BROADWAY, 610
MISSOULA, MT 59802
Email To: khouck@herrerainc.com
Phone: 406-721-4204 Fax:
Requested Due Date/TAT:

Section B Required Project Information:

Report To: Kevin Houck
Copy To: Devin Clary / Mark Donner
Purchase Order No.:
Project Name: Black Pine Mine
Project Number:

Section C Invoice Information:

Attention: Devin Clary
Company Name:
Address:
Pace Quote Reference:
Pace Project Manager:
Pace Profile #:

REGULATORY AGENCY
☐ NPDES ☐ GROUND WATER ☐ DRINKING WATER
☐ UST ☐ RCRA ☐ OTHER
Site Location STATE:

Section D Required Client Information

Matrix Codes (MATRIX / CODE): Drinking Water DW; Water WT; Waste Water WW; Product P; Soil/Solid SL; Oil OL; Wipe WP; Air AR; Tissue TS; Other OT

SAMPLE ID (A-Z, 0-9 / ,-) Sample IDs MUST BE UNIQUE

ITEM #	SAMPLE ID	MATRIX CODE (see valid codes to left)	SAMPLE TYPE (G=GRAB C=COMP)	COLLECTED DATE	COLLECTED TIME	COMPOSITE END/GRAB DATE	COMPOSITE END/GRAB TIME	SAMPLE TEMP AT COLLECTION	# OF CONTAINERS	Preservatives: Unpreserved	H_2SO_4	HNO_3	HCl	NaOH	$Na_2S_2O_3$	Methanol	Other	Requested Analysis Filtered (Y/N)	Residual Chlorine (Y/N)	Pace Project No./ Lab I.D.
1	BP-CMN-SS-17	S	G	8-18-11	1000			1										X		001
2	BP-CMN-SS-18	S	G	1	1010			1										X		002
3	BP-CMN-SS-19	S	G	1	1050			1										X		003
4																				
5																				
6																				
7																				
8																				
9																				
10																				
11																				
12																				

Analysis Test (Y/N): Total Metals

ADDITIONAL COMMENTS	RELINQUISHED BY / AFFILIATION	DATE	TIME	ACCEPTED BY / AFFILIATION	DATE	TIME	SAMPLE CONDITIONS			
	HLC	8-19-11	1203	Pace	8-20-11	925	6.0	Y	Y	Y
	PACE	8-19-11	1203							

SAMPLER NAME AND SIGNATURE
PRINT Name of SAMPLER:
SIGNATURE of SAMPLER: DATE Signed (MM/DD/YY):

Temp in °C | Received on Ice (Y/N) | Custody Sealed Cooler (Y/N) | Samples Intact (Y/N)

2

*Important Note: By signing this form you are accepting Pace's NET 30 day payment terms and agreeing to late charges of 1.5% per month for any invoices not paid within 30 days.

F-ALL-Q-020rev.07, 15-May-2007

Pace Analytical®	Document Name: Sample Condition Upon Receipt Form	Revised Date: 02Jun2011 Page 1 of 1
	Document Number: F-L-213 Rev.01	Issuing Authority: Pace Minnesota Quality Office

Sample Condition Upon Receipt

Client Name: Herrera **Project #** lot 67132

Courier: [X] Fed Ex [ ] UPS [ ] USPS [ ] Client [ ] Commercial [ ] Pace [ ] Other _____

Tracking #: 875397529319

Custody Seal on Cooler/Box Present: [X] yes [ ] no **Seals intact:** [X] yes [ ] no

Packing Material: [ ] Bubble Wrap [X] Bubble Bags [ ] None [ ] Other _____ **Temp Blank:** Yes ____ No X

Thermometer Used 80344042 or 80512447 **Type of Ice:** (Wet) Blue None [ ] Samples on ice, cooling process has begun

Cooler Temperature 6.0 **Biological Tissue is Frozen:** Yes No **Date and initials of person examining contents:** 8-20-11 MB

Temp should be above freezing to 6°C **Comments:**

Chain of Custody Present:	[X] Yes [ ] No [ ] N/A	1.
Chain of Custody Filled Out:	[X] Yes [ ] No [ ] N/A	2.
Chain of Custody Relinquished:	[X] Yes [ ] No [ ] N/A	3.
Sampler Name & Signature on COC:	[ ] Yes [X] No [ ] N/A	4.
Samples Arrived within Hold Time:	[X] Yes [ ] No [ ] N/A	5.
Short Hold Time Analysis (<72hr):	[ ] Yes [X] No [ ] N/A	6.
Rush Turn Around Time Requested:	[ ] Yes [X] No [ ] N/A	7.
Sufficient Volume:	[X] Yes [ ] No [ ] N/A	8.
Correct Containers Used:	[X] Yes [ ] No [ ] N/A	9.
-Pace Containers Used:	[X] Yes [ ] No [ ] N/A	
Containers Intact:	[X] Yes [ ] No [ ] N/A	10.
Filtered volume received for Dissolved tests	[ ] Yes [ ] No [X] N/A	11.
Sample Labels match COC: -Includes date/time/ID/Analysis Matrix: S L	[X] Yes [ ] No [ ] N/A	12.
All containers needing acid/base preservation have been checked. Noncompliance are noted in 13.	[ ] Yes [ ] No [X] N/A	13. [ ] HNO3 [ ] H2SO4 [ ] NaOH [ ] HCl Samp #
All containers needing preservation are found to be in compliance with EPA recommendation.	[ ] Yes [ ] No [X] N/A	
Exceptions: VOA,Coliform, TOC, Oil and Grease, WI-DRO (water)	[ ] Yes [X] No	Initial when completed / Lot # of added preservative
Samples checked for dechlorination:	[ ] Yes [ ] No [X] N/A	14.
Headspace in VOA Vials (>6mm):	[ ] Yes [ ] No [X] N/A	15.
Trip Blank Present:	[ ] Yes [ ] No [X] N/A	16.
Trip Blank Custody Seals Present	[ ] Yes [ ] No [X] N/A	
Pace Trip Blank Lot # (If purchased):		

Client Notification/ Resolution: **Field Data Required?** Y / N

Person Contacted: _____ Date/Time: _____

Comments/ Resolution: _____

Project Manager Review: _____ **Date:** 8/22/11

Note: Whenever there is a discrepancy affecting North Carolina compliance samples, a copy of this form will be sent to the North Carolina DEHNR Certification Office (i.e out of hold, incorrect preservative, out of temp, incorrect containers)

APPENDIX C2

ORIGINAL LABORATORY ANALYTICAL REPORTS

Pace Analytical Services, Inc.
602 S 25th Street
Billings, MT 591014549
(406)254-7226

May 25, 2011

Kevin Houck
Herrera Environmental Consultants
101 East Broadway, Suite 610
Missoula, MT 59802

RE: Project: Black Pine Mine
Pace Project No.: 10156716

Dear Kevin Houck:
Enclosed are the analytical results for sample(s) received by the laboratory on May 07, 2011. The results relate only to the samples included in this report.

If you have any questions concerning this report, please feel free to contact me.

Sincerely,

Denise Jensen

denise.jensen@pacelabs.com
Project Manager

Enclosures

cc: Devin Clary, Montana Dept. of Environmental Quality

REPORT OF LABORATORY ANALYSIS

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CERTIFICATIONS

Project: Black Pine Mine
Pace Project No.: 10156716

Minnesota Certification IDs

1700 Elm Street SE Suite 200, Minneapolis, MN 55414
A2LA Certification #: 2926.01
Alaska Certification #: UST-078
Alaska Certification #MN00064
Arizona Certification #: AZ-0014
Arkansas Certification #: 88-0680
California Certification #: 01155CA
EPA Region 8 Certification #: Pace
Florida/NELAP Certification #: E87605
Georgia Certification #: 959
Idaho Certification #: MN00064
Illinois Certification #: 200011
Iowa Certification #: 368
Kansas Certification #: E-10167
Louisiana Certification #: 03086
Louisiana Certification #: LA080009
Maine Certification #: 2007029
Maryland Certification #: 322
Michigan DEQ Certification #: 9909
Minnesota Certification #: 027-053-137
Mississippi Certification #: Pace
Montana Certification #: MT CERT0092
Nebraska Certification #: Pace
Nevada Certification #: MN_00064
New Jersey Certification #: MN-002
New Mexico Certification #: Pace
New York Certification #: 11647
North Carolina Certification #: 530
North Dakota Certification #: R-036
North Dakota Certification #: R-036A
Ohio VAP Certification #: CL101
Oklahoma Certification #: D9921
Oklahoma Certification #: 9507
Oregon Certification #: MN200001
Pennsylvania Certification #: 68-00563
Puerto Rico Certification
Tennessee Certification #: 02818
Texas Certification #: T104704192
Washington Certification #: C754
Wisconsin Certification #: 999407970

Montana Certification IDs

602 South 25th Street, Billings, MT 59101
EPA Region 8 Certification #: 8TMS-Q
Idaho Certification #: MT00012
Montana Certification #: MT CERT0040
NVLAP Certification #: 101292-0
Minnesota Dept of Health Certification #: 030-999-442

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SAMPLE SUMMARY

Project: Black Pine Mine
Pace Project No.: 10156716

Lab ID	Sample ID	Matrix	Date Collected	Date Received
10156716001	**CMMW-1**	Water	05/05/11 17:00	05/07/11 10:00
10156716002	**CMMW-2**	Water	05/05/11 17:30	05/07/11 10:00
10156716003	**CMMW-3**	Water	05/05/11 15:40	05/07/11 10:00
10156716004	**CMMW-4**	Water	05/05/11 16:10	05/07/11 10:00
10156716005	**CMMW-5**	Water	05/05/11 18:00	05/07/11 10:00
10156716006	**CMMW-6**	Water	05/05/11 18:50	05/07/11 10:00
10156716007	**CMMW-7**	Water	05/05/11 14:50	05/07/11 10:00
10156716008	**CMMW-8**	Water	05/05/11 14:10	05/07/11 10:00
10156716009	**CMMW-9**	Water	05/05/11 16:30	05/07/11 10:00
10156716010	**FIELD DUPLICATE**	Water	05/05/11 00:00	05/07/11 10:00

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SAMPLE ANALYTE COUNT

Project: Black Pine Mine
Pace Project No.: 10156716

Lab ID	Sample ID	Method	Analysts	Analytes Reported	Laboratory
10156716001	**CMMW-1**	EPA 200.8	RJS	11	PASI-M
		SM 2540D	MP3	1	PASI-MT
		EPA 300.0	JH1	1	PASI-MT
		SM 2320B	MWD	1	PASI-M
		SM 2540C	CAP	1	PASI-M
10156716002	**CMMW-2**	EPA 200.8	RJS	11	PASI-M
		SM 2540D	MP3	1	PASI-MT
		EPA 300.0	JH1	1	PASI-MT
		SM 2320B	MWD	1	PASI-M
		SM 2540C	CAP	1	PASI-M
10156716003	**CMMW-3**	EPA 200.8	RJS	11	PASI-M
		SM 2540D	MP3	1	PASI-MT
		EPA 300.0	JH1	1	PASI-MT
		SM 2320B	MWD	1	PASI-M
		SM 2540C	CAP	1	PASI-M
10156716004	**CMMW-4**	EPA 200.8	RJS	11	PASI-M
		SM 2540D	MP3	1	PASI-MT
		EPA 300.0	JH1	1	PASI-MT
		SM 2320B	MWD	1	PASI-M
		SM 2540C	CAP	1	PASI-M
10156716005	**CMMW-5**	EPA 200.8	RJS	11	PASI-M
		SM 2540D	MP3	1	PASI-MT
		EPA 300.0	JH1	1	PASI-MT
		SM 2320B	MWD	1	PASI-M
		SM 2540C	CAP	1	PASI-M
10156716006	**CMMW-6**	EPA 200.8	RJS	11	PASI-M
		SM 2540D	MP3	1	PASI-MT
		EPA 300.0	JH1	1	PASI-MT
		SM 2320B	MWD	1	PASI-M
		SM 2540C	CAP	1	PASI-M
10156716007	**CMMW-7**	EPA 200.8	RJS	11	PASI-M
		SM 2540D	MP3	1	PASI-MT
		EPA 300.0	JH1	1	PASI-MT
		SM 2320B	MWD	1	PASI-M
		SM 2540C	CAP	1	PASI-M
10156716008	**CMMW-8**	EPA 200.8	RJS	11	PASI-M
		SM 2540D	MP3	1	PASI-MT

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SAMPLE ANALYTE COUNT

Project: Black Pine Mine
Pace Project No.: 10156716

Lab ID	Sample ID	Method	Analysts	Analytes Reported	Laboratory
		EPA 300.0	JH1	1	PASI-MT
		SM 2320B	MWD	1	PASI-M
		SM 2540C	CAP	1	PASI-M
10156716009	**CMMW-9**	EPA 200.8	RJS	11	PASI-M
		SM 2540D	MP3	1	PASI-MT
		EPA 300.0	JH1	1	PASI-MT
		SM 2320B	MWD	1	PASI-M
		SM 2540C	CAP	1	PASI-M
10156716010	**FIELD DUPLICATE**	EPA 200.8	RJS	11	PASI-M
		SM 2540D	MP3	1	PASI-MT
		EPA 300.0	JH1	1	PASI-MT
		SM 2320B	MWD	1	PASI-M
		SM 2540C	CAP	1	PASI-M

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PROJECT NARRATIVE

Project: Black Pine Mine
Pace Project No.: 10156716

Method: **EPA 200.8**
Description: 200.8 MET ICPMS, Dissolved
Client: Montana Dept. of Environmental Quality
Date: May 25, 2011

General Information:
10 samples were analyzed for EPA 200.8. All samples were received in acceptable condition with any exceptions noted below.

Hold Time:
The samples were analyzed within the method required hold times with any exceptions noted below.

Sample Preparation:
The samples were prepared in accordance with EPA 200.8 with any exceptions noted below.

Initial Calibrations (including MS Tune as applicable):
All criteria were within method requirements with any exceptions noted below.

Continuing Calibration:
All criteria were within method requirements with any exceptions noted below.

Internal Standards:
All internal standards were within QC limits with any exceptions noted below.

Method Blank:
All analytes were below the report limit in the method blank with any exceptions noted below.

Laboratory Control Spike:
All laboratory control spike compounds were within QC limits with any exceptions noted below.

Matrix Spikes:
All percent recoveries and relative percent differences (RPDs) were within acceptance criteria with any exceptions noted below.

QC Batch: MPRP/26002

A matrix spike and matrix spike duplicate (MS/MSD) were performed on the following sample(s): 10156716005,3046013001

M1: Matrix spike recovery exceeded QC limits. Batch accepted based on laboratory control sample (LCS) recovery.

- MS (Lab ID: 973524)
  - Potassium, Dissolved
- MS (Lab ID: 973526)
  - Calcium, Dissolved
- MSD (Lab ID: 973525)
  - Potassium, Dissolved

M6: Matrix spike and Matrix spike duplicate recovery not evaluated against control limits due to sample dilution.

- MS (Lab ID: 973524)
  - Calcium, Dissolved
  - Magnesium, Dissolved
  - Sodium, Dissolved
- MS (Lab ID: 973526)
  - Copper, Dissolved
  - Manganese, Dissolved

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PROJECT NARRATIVE

Project: Black Pine Mine
Pace Project No.: 10156716

Method: **EPA 200.8**
Description: 200.8 MET ICPMS, Dissolved
Client: Montana Dept. of Environmental Quality
Date: May 25, 2011

QC Batch: MPRP/26002

A matrix spike and matrix spike duplicate (MS/MSD) were performed on the following sample(s): 10156716005,3046013001

M6: Matrix spike and Matrix spike duplicate recovery not evaluated against control limits due to sample dilution.

- Zinc, Dissolved

- MSD (Lab ID: 973525)
  - Calcium, Dissolved
  - Magnesium, Dissolved
  - Sodium, Dissolved

Duplicate Sample:
All duplicate sample results were within method acceptance criteria with any exceptions noted below.

Additional Comments:

Analyte Comments:

QC Batch: MPRP/26002

E: Analyte concentration exceeded the calibration range. The reported result is estimated.

- MS (Lab ID: 973526)
  - Copper, Dissolved
  - Zinc, Dissolved

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PROJECT NARRATIVE

Project: Black Pine Mine
Pace Project No.: 10156716

Method: **SM 2540D**
Description: 2540D Total Suspended Solids
Client: Montana Dept. of Environmental Quality
Date: May 25, 2011

General Information:
10 samples were analyzed for SM 2540D. All samples were received in acceptable condition with any exceptions noted below.

Hold Time:
The samples were analyzed within the method required hold times with any exceptions noted below.

Initial Calibrations (including MS Tune as applicable):
All criteria were within method requirements with any exceptions noted below.

Continuing Calibration:
All criteria were within method requirements with any exceptions noted below.

Internal Standards:
All internal standards were within QC limits with any exceptions noted below.

Surrogates:
All surrogates were within QC limits with any exceptions noted below.

Method Blank:
All analytes were below the report limit in the method blank with any exceptions noted below.

Laboratory Control Spike:
All laboratory control spike compounds were within QC limits with any exceptions noted below.

Matrix Spikes:
All percent recoveries and relative percent differences (RPDs) were within acceptance criteria with any exceptions noted below.

Duplicate Sample:
All duplicate sample results were within method acceptance criteria with any exceptions noted below.

Additional Comments:

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PROJECT NARRATIVE

Project: Black Pine Mine
Pace Project No.: 10156716

Method: **EPA 300.0**
Description: 300.0 IC Anions
Client: Montana Dept. of Environmental Quality
Date: May 25, 2011

General Information:
10 samples were analyzed for EPA 300.0. All samples were received in acceptable condition with any exceptions noted below.

Hold Time:
The samples were analyzed within the method required hold times with any exceptions noted below.

Initial Calibrations (including MS Tune as applicable):
All criteria were within method requirements with any exceptions noted below.

Continuing Calibration:
All criteria were within method requirements with any exceptions noted below.

Internal Standards:
All internal standards were within QC limits with any exceptions noted below.

Surrogates:
All surrogates were within QC limits with any exceptions noted below.

Method Blank:
All analytes were below the report limit in the method blank with any exceptions noted below.

Laboratory Control Spike:
All laboratory control spike compounds were within QC limits with any exceptions noted below.

Matrix Spikes:
All percent recoveries and relative percent differences (RPDs) were within acceptance criteria with any exceptions noted below.

Duplicate Sample:
All duplicate sample results were within method acceptance criteria with any exceptions noted below.

Additional Comments:

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PROJECT NARRATIVE

Project: Black Pine Mine
Pace Project No.: 10156716

Method: **SM 2320B**
Description: 2320B Alkalinity
Client: Montana Dept. of Environmental Quality
Date: May 25, 2011

General Information:
10 samples were analyzed for SM 2320B. All samples were received in acceptable condition with any exceptions noted below.

Hold Time:
The samples were analyzed within the method required hold times with any exceptions noted below.

Method Blank:
All analytes were below the report limit in the method blank with any exceptions noted below.

Laboratory Control Spike:
All laboratory control spike compounds were within QC limits with any exceptions noted below.

Matrix Spikes:
All percent recoveries and relative percent differences (RPDs) were within acceptance criteria with any exceptions noted below.

QC Batch: WET/22267

A matrix spike and matrix spike duplicate (MS/MSD) were performed on the following sample(s): 10156475001,10156716006

M1: Matrix spike recovery exceeded QC limits. Batch accepted based on laboratory control sample (LCS) recovery.

- MSD (Lab ID: 974281)
  - Alkalinity, Total as CaCO3

Duplicate Sample:
All duplicate sample results were within method acceptance criteria with any exceptions noted below.

Additional Comments:

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PROJECT NARRATIVE

Project: Black Pine Mine
Pace Project No.: 10156716

Method: **SM 2540C**
Description: 2540C Total Dissolved Solids
Client: Montana Dept. of Environmental Quality
Date: May 25, 2011

General Information:
10 samples were analyzed for SM 2540C. All samples were received in acceptable condition with any exceptions noted below.

Hold Time:
The samples were analyzed within the method required hold times with any exceptions noted below.

Method Blank:
All analytes were below the report limit in the method blank with any exceptions noted below.

Laboratory Control Spike:
All laboratory control spike compounds were within QC limits with any exceptions noted below.

Matrix Spikes:
All percent recoveries and relative percent differences (RPDs) were within acceptance criteria with any exceptions noted below.

Duplicate Sample:
All duplicate sample results were within method acceptance criteria with any exceptions noted below.

Additional Comments:

Analyte Comments:

QC Batch: WET/22274

1M: Duplicate was analyzed out of hold for confirmation of failing RPD results of original analysis conducted within hold. Upon re-analysis the results were confirmed to original parent sample results; including passing RPD recovery. Results have been flagged and reported accordingly.

- DUP (Lab ID: 974435)
  - Total Dissolved Solids

This data package has been reviewed for quality and completeness and is approved for release.

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ANALYTICAL RESULTS

Project: Black Pine Mine
Pace Project No.: 10156716

Sample: CMMW-1 **Lab ID: 10156716001** Collected: 05/05/11 17:00 Received: 05/07/11 10:00 Matrix: Water

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
200.8 MET ICPMS, Dissolved	Analytical Method: EPA 200.8 Preparation Method: EPA 200.8							
Arsenic, Dissolved	**1.6**	ug/L	0.50	1	05/10/11 18:52	05/13/11 17:30	7440-38-2	
Cadmium, Dissolved	**0.13**	ug/L	0.080	1	05/10/11 18:52	05/13/11 17:30	7440-43-9	
Calcium, Dissolved	**7040**	ug/L	20.0	1	05/10/11 18:52	05/13/11 17:30	7440-70-2	
Copper, Dissolved	**1.3**	ug/L	0.50	1	05/10/11 18:52	05/13/11 17:30	7440-50-8	
Iron, Dissolved	**550**	ug/L	50.0	1	05/10/11 18:52	05/13/11 17:30	7439-89-6	
Lead, Dissolved	**0.90**	ug/L	0.10	1	05/10/11 18:52	05/13/11 17:30	7439-92-1	
Magnesium, Dissolved	**3960**	ug/L	5.0	1	05/10/11 18:52	05/13/11 17:30	7439-95-4	
Manganese, Dissolved	**7.1**	ug/L	0.50	1	05/10/11 18:52	05/13/11 17:30	7439-96-5	
Potassium, Dissolved	**1270**	ug/L	20.0	1	05/10/11 18:52	05/13/11 17:30	7440-09-7	
Sodium, Dissolved	**8380**	ug/L	250	5	05/10/11 18:52	05/16/11 13:11	7440-23-5	
Zinc, Dissolved	**6.1**	ug/L	5.0	1	05/10/11 18:52	05/13/11 17:30	7440-66-6	
2540D Total Suspended Solids	Analytical Method: SM 2540D							
Total Suspended Solids	**1930**	mg/L	4.0	1		05/10/11 08:45		
300.0 IC Anions	Analytical Method: EPA 300.0							
Sulfate	**2.3**	mg/L	1.0	1		05/16/11 14:20	14808-79-8	
2320B Alkalinity	Analytical Method: SM 2320B							
Alkalinity, Total as CaCO3	**42.6**	mg/L	5.0	1		05/11/11 10:01		
2540C Total Dissolved Solids	Analytical Method: SM 2540C							
Total Dissolved Solids	**86.0**	mg/L	20.0	1		05/12/11 08:38		

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ANALYTICAL RESULTS

Project: Black Pine Mine
Pace Project No.: 10156716

Sample: CMMW-2 **Lab ID: 10156716002** Collected: 05/05/11 17:30 Received: 05/07/11 10:00 Matrix: Water

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
200.8 MET ICPMS, Dissolved	Analytical Method: EPA 200.8 Preparation Method: EPA 200.8							
Arsenic, Dissolved	**108**	ug/L	0.50	1	05/10/11 18:52	05/13/11 17:39	7440-38-2	
Cadmium, Dissolved	**14.5**	ug/L	0.080	1	05/10/11 18:52	05/13/11 17:39	7440-43-9	
Calcium, Dissolved	**277000**	ug/L	1000	50	05/10/11 18:52	05/16/11 12:46	7440-70-2	
Copper, Dissolved	**239**	ug/L	0.50	1	05/10/11 18:52	05/13/11 17:39	7440-50-8	
Iron, Dissolved	**121**	ug/L	50.0	1	05/10/11 18:52	05/13/11 17:39	7439-89-6	
Lead, Dissolved	**8.6**	ug/L	0.10	1	05/10/11 18:52	05/13/11 17:39	7439-92-1	
Magnesium, Dissolved	**56500**	ug/L	25.0	5	05/10/11 18:52	05/13/11 17:44	7439-95-4	
Manganese, Dissolved	**103**	ug/L	0.50	1	05/10/11 18:52	05/13/11 17:39	7439-96-5	
Potassium, Dissolved	**17200**	ug/L	20.0	1	05/10/11 18:52	05/13/11 17:39	7440-09-7	
Sodium, Dissolved	**106000**	ug/L	2500	50	05/10/11 18:52	05/16/11 12:46	7440-23-5	
Zinc, Dissolved	**1410**	ug/L	25.0	5	05/10/11 18:52	05/13/11 17:44	7440-66-6	
2540D Total Suspended Solids	Analytical Method: SM 2540D							
Total Suspended Solids	**89.9**	mg/L	4.8	1		05/10/11 08:45		
300.0 IC Anions	Analytical Method: EPA 300.0							
Sulfate	**927**	mg/L	25.0	25		05/19/11 17:17	14808-79-8	
2320B Alkalinity	Analytical Method: SM 2320B							
Alkalinity, Total as CaCO3	**176**	mg/L	5.0	1		05/11/11 10:04		
2540C Total Dissolved Solids	Analytical Method: SM 2540C							
Total Dissolved Solids	**1600**	mg/L	20.0	1		05/12/11 08:39		

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ANALYTICAL RESULTS

Project: Black Pine Mine
Pace Project No.: 10156716

Sample: CMMW-3 **Lab ID: 10156716003** Collected: 05/05/11 15:40 Received: 05/07/11 10:00 Matrix: Water

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
200.8 MET ICPMS, Dissolved	Analytical Method: EPA 200.8 Preparation Method: EPA 200.8							
Arsenic, Dissolved	**<0.50**	ug/L	0.50	1	05/10/11 18:52	05/13/11 17:48	7440-38-2	
Cadmium, Dissolved	**170**	ug/L	0.080	1	05/10/11 18:52	05/13/11 17:48	7440-43-9	
Calcium, Dissolved	**57200**	ug/L	100	5	05/10/11 18:52	05/16/11 12:51	7440-70-2	
Copper, Dissolved	**12100**	ug/L	25.0	50	05/10/11 18:52	05/16/11 12:55	7440-50-8	
Iron, Dissolved	**<50.0**	ug/L	50.0	1	05/10/11 18:52	05/13/11 17:48	7439-89-6	
Lead, Dissolved	**0.31**	ug/L	0.10	1	05/10/11 18:52	05/13/11 17:48	7439-92-1	
Magnesium, Dissolved	**23400**	ug/L	25.0	5	05/10/11 18:52	05/16/11 12:51	7439-95-4	
Manganese, Dissolved	**4280**	ug/L	25.0	50	05/10/11 18:52	05/16/11 12:55	7439-96-5	
Potassium, Dissolved	**4250**	ug/L	20.0	1	05/10/11 18:52	05/13/11 17:48	7440-09-7	
Sodium, Dissolved	**6430**	ug/L	250	5	05/10/11 18:52	05/16/11 12:51	7440-23-5	
Zinc, Dissolved	**12200**	ug/L	250	50	05/10/11 18:52	05/16/11 12:55	7440-66-6	
2540D Total Suspended Solids	Analytical Method: SM 2540D							
Total Suspended Solids	**358**	mg/L	2.0	1		05/10/11 08:45		
300.0 IC Anions	Analytical Method: EPA 300.0							
Sulfate	**282**	mg/L	10.0	10		05/19/11 18:14	14808-79-8	
2320B Alkalinity	Analytical Method: SM 2320B							
Alkalinity, Total as CaCO3	**<5.0**	mg/L	5.0	1		05/11/11 10:07		
2540C Total Dissolved Solids	Analytical Method: SM 2540C							
Total Dissolved Solids	**516**	mg/L	22.2	1		05/12/11 08:40		

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ANALYTICAL RESULTS

Project: Black Pine Mine
Pace Project No.: 10156716

Sample: CMMW-4 **Lab ID: 10156716004** Collected: 05/05/11 16:10 Received: 05/07/11 10:00 Matrix: Water

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
200.8 MET ICPMS, Dissolved	Analytical Method: EPA 200.8 Preparation Method: EPA 200.8							
Arsenic, Dissolved	**<0.50**	ug/L	0.50	1	05/10/11 18:52	05/13/11 18:16	7440-38-2	
Cadmium, Dissolved	**51.9**	ug/L	0.080	1	05/10/11 18:52	05/13/11 18:16	7440-43-9	
Calcium, Dissolved	**39700**	ug/L	100	5	05/10/11 18:52	05/16/11 13:16	7440-70-2	
Copper, Dissolved	**3120**	ug/L	25.0	50	05/10/11 18:52	05/16/11 13:21	7440-50-8	
Iron, Dissolved	**<50.0**	ug/L	50.0	1	05/10/11 18:52	05/13/11 18:16	7439-89-6	
Lead, Dissolved	**0.12**	ug/L	0.10	1	05/10/11 18:52	05/13/11 18:16	7439-92-1	
Magnesium, Dissolved	**14500**	ug/L	5.0	1	05/10/11 18:52	05/13/11 18:16	7439-95-4	
Manganese, Dissolved	**884**	ug/L	2.5	5	05/10/11 18:52	05/16/11 13:16	7439-96-5	
Potassium, Dissolved	**2340**	ug/L	20.0	1	05/10/11 18:52	05/13/11 18:16	7440-09-7	
Sodium, Dissolved	**7000**	ug/L	250	5	05/10/11 18:52	05/16/11 13:16	7440-23-5	
Zinc, Dissolved	**3940**	ug/L	250	50	05/10/11 18:52	05/16/11 13:21	7440-66-6	
2540D Total Suspended Solids	Analytical Method: SM 2540D							
Total Suspended Solids	**21.9**	mg/L	1.0	1		05/10/11 08:45		
300.0 IC Anions	Analytical Method: EPA 300.0							
Sulfate	**174**	mg/L	5.0	5		05/19/11 18:42	14808-79-8	
2320B Alkalinity	Analytical Method: SM 2320B							
Alkalinity, Total as CaCO3	**<5.0**	mg/L	5.0	1		05/11/11 10:17		
2540C Total Dissolved Solids	Analytical Method: SM 2540C							
Total Dissolved Solids	**294**	mg/L	10.0	1		05/12/11 08:41		

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ANALYTICAL RESULTS

Project: Black Pine Mine
Pace Project No.: 10156716

Sample: CMMW-5 **Lab ID: 10156716005** Collected: 05/05/11 18:00 Received: 05/07/11 10:00 Matrix: Water

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
200.8 MET ICPMS, Dissolved	Analytical Method: EPA 200.8 Preparation Method: EPA 200.8							
Arsenic, Dissolved	**3.0**	ug/L	0.50	1	05/10/11 18:52	05/13/11 18:25	7440-38-2	
Cadmium, Dissolved	**152**	ug/L	0.080	1	05/10/11 18:52	05/13/11 18:25	7440-43-9	
Calcium, Dissolved	**23500**	ug/L	100	5	05/10/11 18:52	05/16/11 13:25	7440-70-2	M1
Copper, Dissolved	**7100**	ug/L	25.0	50	05/10/11 18:52	05/16/11 13:35	7440-50-8	M6
Iron, Dissolved	**988**	ug/L	50.0	1	05/10/11 18:52	05/13/11 18:25	7439-89-6	
Lead, Dissolved	**23.2**	ug/L	0.10	1	05/10/11 18:52	05/13/11 18:25	7439-92-1	
Magnesium, Dissolved	**8100**	ug/L	5.0	1	05/10/11 18:52	05/13/11 18:25	7439-95-4	
Manganese, Dissolved	**4040**	ug/L	25.0	50	05/10/11 18:52	05/16/11 13:35	7439-96-5	M6
Potassium, Dissolved	**3400**	ug/L	20.0	1	05/10/11 18:52	05/13/11 18:25	7440-09-7	
Sodium, Dissolved	**2670**	ug/L	250	5	05/10/11 18:52	05/16/11 13:25	7440-23-5	
Zinc, Dissolved	**10700**	ug/L	250	50	05/10/11 18:52	05/16/11 13:35	7440-66-6	M6
2540D Total Suspended Solids	Analytical Method: SM 2540D							
Total Suspended Solids	**782**	mg/L	4.9	1		05/10/11 08:45		
300.0 IC Anions	Analytical Method: EPA 300.0							
Sulfate	**113**	mg/L	3.0	3		05/19/11 19:11	14808-79-8	
2320B Alkalinity	Analytical Method: SM 2320B							
Alkalinity, Total as CaCO3	**<5.0**	mg/L	5.0	1		05/11/11 10:19		
2540C Total Dissolved Solids	Analytical Method: SM 2540C							
Total Dissolved Solids	**268**	mg/L	40.0	1		05/12/11 08:42		

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ANALYTICAL RESULTS

Project: Black Pine Mine
Pace Project No.: 10156716

Sample: CMMW-6 **Lab ID: 10156716006** Collected: 05/05/11 18:50 Received: 05/07/11 10:00 Matrix: Water

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
200.8 MET ICPMS, Dissolved	Analytical Method: EPA 200.8 Preparation Method: EPA 200.8							
Arsenic, Dissolved	**1.9**	ug/L	0.50	1	05/10/11 18:52	05/13/11 18:38	7440-38-2	
Cadmium, Dissolved	**0.53**	ug/L	0.080	1	05/10/11 18:52	05/13/11 18:38	7440-43-9	
Calcium, Dissolved	**11600**	ug/L	20.0	1	05/10/11 18:52	05/13/11 18:38	7440-70-2	
Copper, Dissolved	**19.4**	ug/L	0.50	1	05/10/11 18:52	05/13/11 18:38	7440-50-8	
Iron, Dissolved	**661**	ug/L	50.0	1	05/10/11 18:52	05/13/11 18:38	7439-89-6	
Lead, Dissolved	**4.1**	ug/L	0.10	1	05/10/11 18:52	05/13/11 18:38	7439-92-1	
Magnesium, Dissolved	**4920**	ug/L	5.0	1	05/10/11 18:52	05/13/11 18:38	7439-95-4	
Manganese, Dissolved	**19.9**	ug/L	0.50	1	05/10/11 18:52	05/13/11 18:38	7439-96-5	
Potassium, Dissolved	**2220**	ug/L	20.0	1	05/10/11 18:52	05/13/11 18:38	7440-09-7	
Sodium, Dissolved	**3270**	ug/L	250	5	05/10/11 18:52	05/16/11 13:39	7440-23-5	
Zinc, Dissolved	**33.3**	ug/L	5.0	1	05/10/11 18:52	05/13/11 18:38	7440-66-6	
2540D Total Suspended Solids	Analytical Method: SM 2540D							
Total Suspended Solids	**311**	mg/L	4.0	1		05/10/11 08:45		
300.0 IC Anions	Analytical Method: EPA 300.0							
Sulfate	**11.9**	mg/L	2.0	2		05/19/11 19:39	14808-79-8	
2320B Alkalinity	Analytical Method: SM 2320B							
Alkalinity, Total as CaCO3	**39.0**	mg/L	5.0	1		05/11/11 10:21		
2540C Total Dissolved Solids	Analytical Method: SM 2540C							
Total Dissolved Solids	**150**	mg/L	25.0	1		05/12/11 08:42		

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ANALYTICAL RESULTS

Project: Black Pine Mine
Pace Project No.: 10156716

Sample: CMMW-7 **Lab ID: 10156716007** Collected: 05/05/11 14:50 Received: 05/07/11 10:00 Matrix: Water

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
200.8 MET ICPMS, Dissolved	Analytical Method: EPA 200.8 Preparation Method: EPA 200.8							
Arsenic, Dissolved	**2.2**	ug/L	0.50	1	05/10/11 18:52	05/13/11 18:47	7440-38-2	
Cadmium, Dissolved	**305**	ug/L	0.080	1	05/10/11 18:52	05/13/11 18:47	7440-43-9	
Calcium, Dissolved	**95600**	ug/L	100	5	05/10/11 18:52	05/16/11 13:44	7440-70-2	
Copper, Dissolved	**22200**	ug/L	50.0	100	05/10/11 18:52	05/16/11 13:49	7440-50-8	
Iron, Dissolved	**2050**	ug/L	50.0	1	05/10/11 18:52	05/13/11 18:47	7439-89-6	
Lead, Dissolved	**2.6**	ug/L	0.10	1	05/10/11 18:52	05/13/11 18:47	7439-92-1	
Magnesium, Dissolved	**38800**	ug/L	25.0	5	05/10/11 18:52	05/16/11 13:44	7439-95-4	
Manganese, Dissolved	**7740**	ug/L	50.0	100	05/10/11 18:52	05/16/11 13:49	7439-96-5	
Potassium, Dissolved	**5650**	ug/L	20.0	1	05/10/11 18:52	05/13/11 18:47	7440-09-7	
Sodium, Dissolved	**7320**	ug/L	250	5	05/10/11 18:52	05/16/11 13:44	7440-23-5	
Zinc, Dissolved	**22300**	ug/L	500	100	05/10/11 18:52	05/16/11 13:49	7440-66-6	
2540D Total Suspended Solids	Analytical Method: SM 2540D							
Total Suspended Solids	**4170**	mg/L	8.8	1		05/10/11 08:45		
300.0 IC Anions	Analytical Method: EPA 300.0							
Sulfate	**480**	mg/L	50.0	50		05/23/11 19:17	14808-79-8	
2320B Alkalinity	Analytical Method: SM 2320B							
Alkalinity, Total as CaCO3	**13.0**	mg/L	5.0	1		05/11/11 10:41		
2540C Total Dissolved Solids	Analytical Method: SM 2540C							
Total Dissolved Solids	**802**	mg/L	25.0	1		05/12/11 08:43		

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ANALYTICAL RESULTS

Project: Black Pine Mine
Pace Project No.: 10156716

Sample: CMMW-8 **Lab ID: 10156716008** Collected: 05/05/11 14:10 Received: 05/07/11 10:00 Matrix: Water

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
200.8 MET ICPMS, Dissolved	Analytical Method: EPA 200.8 Preparation Method: EPA 200.8							
Arsenic, Dissolved	**0.57**	ug/L	0.50	1	05/10/11 18:52	05/13/11 19:10	7440-38-2	
Cadmium, Dissolved	**155**	ug/L	0.080	1	05/10/11 18:52	05/13/11 19:10	7440-43-9	
Calcium, Dissolved	**145000**	ug/L	1000	50	05/10/11 18:52	05/17/11 07:55	7440-70-2	
Copper, Dissolved	**8420**	ug/L	25.0	50	05/10/11 18:52	05/17/11 07:55	7440-50-8	
Iron, Dissolved	**281**	ug/L	50.0	1	05/10/11 18:52	05/13/11 19:10	7439-89-6	
Lead, Dissolved	**0.48**	ug/L	0.10	1	05/10/11 18:52	05/13/11 19:10	7439-92-1	
Magnesium, Dissolved	**63800**	ug/L	25.0	5	05/10/11 18:52	05/17/11 07:51	7439-95-4	
Manganese, Dissolved	**4550**	ug/L	25.0	50	05/10/11 18:52	05/17/11 07:55	7439-96-5	
Potassium, Dissolved	**5520**	ug/L	20.0	1	05/10/11 18:52	05/13/11 19:10	7440-09-7	
Sodium, Dissolved	**32900**	ug/L	250	5	05/10/11 18:52	05/17/11 07:51	7440-23-5	
Zinc, Dissolved	**12300**	ug/L	250	50	05/10/11 18:52	05/17/11 07:55	7440-66-6	
2540D Total Suspended Solids	Analytical Method: SM 2540D							
Total Suspended Solids	**350**	mg/L	9.8	1		05/10/11 08:45		
300.0 IC Anions	Analytical Method: EPA 300.0							
Sulfate	**656**	mg/L	50.0	50		05/23/11 19:45	14808-79-8	
2320B Alkalinity	Analytical Method: SM 2320B							
Alkalinity, Total as CaCO3	**18.6**	mg/L	5.0	1		05/11/11 10:44		
2540C Total Dissolved Solids	Analytical Method: SM 2540C							
Total Dissolved Solids	**1020**	mg/L	13.3	1		05/12/11 08:44		

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ANALYTICAL RESULTS

Project: Black Pine Mine
Pace Project No.: 10156716

Sample: CMMW-9 **Lab ID: 10156716009** Collected: 05/05/11 16:30 Received: 05/07/11 10:00 Matrix: Water

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
200.8 MET ICPMS, Dissolved	Analytical Method: EPA 200.8 Preparation Method: EPA 200.8							
Arsenic, Dissolved	**0.72**	ug/L	0.50	1	05/10/11 18:52	05/13/11 19:19	7440-38-2	
Cadmium, Dissolved	**6.9**	ug/L	0.080	1	05/10/11 18:52	05/13/11 19:19	7440-43-9	
Calcium, Dissolved	**87200**	ug/L	100	5	05/10/11 18:52	05/16/11 13:53	7440-70-2	
Copper, Dissolved	**24.1**	ug/L	0.50	1	05/10/11 18:52	05/13/11 19:19	7440-50-8	
Iron, Dissolved	**197**	ug/L	50.0	1	05/10/11 18:52	05/13/11 19:19	7439-89-6	
Lead, Dissolved	**0.38**	ug/L	0.10	1	05/10/11 18:52	05/13/11 19:19	7439-92-1	
Magnesium, Dissolved	**26800**	ug/L	25.0	5	05/10/11 18:52	05/16/11 13:53	7439-95-4	
Manganese, Dissolved	**86.4**	ug/L	0.50	1	05/10/11 18:52	05/13/11 19:19	7439-96-5	
Potassium, Dissolved	**4910**	ug/L	20.0	1	05/10/11 18:52	05/13/11 19:19	7440-09-7	
Sodium, Dissolved	**29400**	ug/L	250	5	05/10/11 18:52	05/16/11 13:53	7440-23-5	
Zinc, Dissolved	**709**	ug/L	25.0	5	05/10/11 18:52	05/16/11 13:53	7440-66-6	
2540D Total Suspended Solids	Analytical Method: SM 2540D							
Total Suspended Solids	**1330**	mg/L	9.4	1		05/10/11 08:45		
300.0 IC Anions	Analytical Method: EPA 300.0							
Sulfate	**299**	mg/L	25.0	25		05/23/11 20:14	14808-79-8	
2320B Alkalinity	Analytical Method: SM 2320B							
Alkalinity, Total as CaCO3	**23.4**	mg/L	5.0	1		05/11/11 10:46		
2540C Total Dissolved Solids	Analytical Method: SM 2540C							
Total Dissolved Solids	**616**	mg/L	40.0	1		05/12/11 08:45		

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ANALYTICAL RESULTS

Project: Black Pine Mine
Pace Project No.: 10156716

Sample: FIELD DUPLICATE **Lab ID: 10156716010** Collected: 05/05/11 00:00 Received: 05/07/11 10:00 Matrix: Water

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
200.8 MET ICPMS, Dissolved	Analytical Method: EPA 200.8 Preparation Method: EPA 200.8							
Arsenic, Dissolved	**1.2**	ug/L	0.50	1	05/10/11 18:52	05/13/11 19:28	7440-38-2	
Cadmium, Dissolved	**0.10**	ug/L	0.080	1	05/10/11 18:52	05/13/11 19:28	7440-43-9	
Calcium, Dissolved	**7020**	ug/L	20.0	1	05/10/11 18:52	05/13/11 19:28	7440-70-2	
Copper, Dissolved	**0.93**	ug/L	0.50	1	05/10/11 18:52	05/13/11 19:28	7440-50-8	
Iron, Dissolved	**73.0**	ug/L	50.0	1	05/10/11 18:52	05/13/11 19:28	7439-89-6	
Lead, Dissolved	**0.15**	ug/L	0.10	1	05/10/11 18:52	05/13/11 19:28	7439-92-1	
Magnesium, Dissolved	**3840**	ug/L	5.0	1	05/10/11 18:52	05/13/11 19:28	7439-95-4	
Manganese, Dissolved	**3.6**	ug/L	0.50	1	05/10/11 18:52	05/13/11 19:28	7439-96-5	
Potassium, Dissolved	**864**	ug/L	20.0	1	05/10/11 18:52	05/13/11 19:28	7440-09-7	
Sodium, Dissolved	**10100**	ug/L	250	5	05/10/11 18:52	05/16/11 14:40	7440-23-5	
Zinc, Dissolved	**<5.0**	ug/L	5.0	1	05/10/11 18:52	05/13/11 19:28	7440-66-6	
2540D Total Suspended Solids	Analytical Method: SM 2540D							
Total Suspended Solids	**3810**	mg/L	8.8	1		05/10/11 08:45		
300.0 IC Anions	Analytical Method: EPA 300.0							
Sulfate	**2.8**	mg/L	2.0	2		05/19/11 22:29	14808-79-8	
2320B Alkalinity	Analytical Method: SM 2320B							
Alkalinity, Total as CaCO3	**48.1**	mg/L	5.0	1		05/11/11 10:49		
2540C Total Dissolved Solids	Analytical Method: SM 2540C							
Total Dissolved Solids	**231**	mg/L	62.5	1		05/12/11 08:45		

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QUALITY CONTROL DATA

Project: Black Pine Mine
Pace Project No.: 10156716

QC Batch: MPRP/26002 Analysis Method: EPA 200.8
QC Batch Method: EPA 200.8 Analysis Description: 200.8 MET Dissolved
Associated Lab Samples: 10156716001, 10156716002, 10156716003, 10156716004, 10156716005, 10156716006, 10156716007, 10156716008, 10156716009, 10156716010

METHOD BLANK: 973522 Matrix: Water
Associated Lab Samples: 10156716001, 10156716002, 10156716003, 10156716004, 10156716005, 10156716006, 10156716007, 10156716008, 10156716009, 10156716010

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Arsenic, Dissolved	ug/L	<0.50	0.50	05/13/11 16:04	
Cadmium, Dissolved	ug/L	<0.080	0.080	05/13/11 16:04	
Calcium, Dissolved	ug/L	<20.0	20.0	05/13/11 16:04	
Copper, Dissolved	ug/L	<0.50	0.50	05/13/11 16:04	
Iron, Dissolved	ug/L	<50.0	50.0	05/13/11 16:04	
Lead, Dissolved	ug/L	<0.10	0.10	05/13/11 16:04	
Magnesium, Dissolved	ug/L	<5.0	5.0	05/13/11 16:04	
Manganese, Dissolved	ug/L	<0.50	0.50	05/13/11 16:04	
Potassium, Dissolved	ug/L	<20.0	20.0	05/13/11 16:04	
Sodium, Dissolved	ug/L	<50.0	50.0	05/16/11 14:07	
Zinc, Dissolved	ug/L	<5.0	5.0	05/13/11 16:04	

LABORATORY CONTROL SAMPLE: 973523

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Arsenic, Dissolved	ug/L	80	82.8	103	85-115	
Cadmium, Dissolved	ug/L	80	82.1	103	85-115	
Calcium, Dissolved	ug/L	1000	1040	104	85-115	
Copper, Dissolved	ug/L	80	83.0	104	85-115	
Iron, Dissolved	ug/L	1000	990	99	85-115	
Lead, Dissolved	ug/L	80	84.1	105	85-115	
Magnesium, Dissolved	ug/L	1000	1040	104	85-115	
Manganese, Dissolved	ug/L	80	85.5	107	85-115	
Potassium, Dissolved	ug/L	1000	1020	102	85-115	
Sodium, Dissolved	ug/L	1000	959	96	85-115	
Zinc, Dissolved	ug/L	80	82.3	103	85-115	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 973524 973525

Parameter	Units	3046013001 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Arsenic, Dissolved	ug/L	0.81	80	80	97.2	99.4	121	123	70-130	2	20	
Cadmium, Dissolved	ug/L	ND	80	80	89.6	92.2	112	115	70-130	3	20	
Calcium, Dissolved	ug/L	479000	1000	1000	394000	440000	-8540	-3900	70-130	11	20	M6
Copper, Dissolved	ug/L	1.3	80	80	92.0	94.0	113	116	70-130	2	20	
Iron, Dissolved	ug/L	ND	1000	1000	1100	1110	109	111	70-130	1	20	
Lead, Dissolved	ug/L	ND	80	80	87.6	91.3	109	114	70-130	4	20	
Magnesium, Dissolved	ug/L	170000	1000	1000	141000	156000	-2840	-1310	70-130	10	20	M6

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QUALITY CONTROL DATA

Project: Black Pine Mine
Pace Project No.: 10156716

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 973524 973525

Parameter	Units	3046013001 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Manganese, Dissolved	ug/L	44.2	80	80	139	143	119	123	70-130	3	20	
Potassium, Dissolved	ug/L	34600	1000	1000	36800	38500	214	382	70-130	4	20	M1
Sodium, Dissolved	ug/L	156000	1000	1000	133000	147000	-2310	-902	70-130	10	20	M6
Zinc, Dissolved	ug/L	ND	80	80	91.8	95.4	112	116	70-130	4	20	

MATRIX SPIKE SAMPLE: 973526

Parameter	Units	10156716005 Result	Spike Conc.	MS Result	MS % Rec	% Rec Limits	Qualifiers
Arsenic, Dissolved	ug/L	3.0	80	85.2	103	70-130	
Cadmium, Dissolved	ug/L	152	80	239	109	70-130	
Calcium, Dissolved	ug/L	23500	1000	23700	22	70-130	M1
Copper, Dissolved	ug/L	7100	80	7800	869	70-130	E,M6
Iron, Dissolved	ug/L	988	1000	2220	123	70-130	
Lead, Dissolved	ug/L	23.2	80	114	113	70-130	
Magnesium, Dissolved	ug/L	8100	1000	9360	126	70-130	
Manganese, Dissolved	ug/L	4040	80	4410	457	70-130	M6
Potassium, Dissolved	ug/L	3400	1000	4650	125	70-130	
Sodium, Dissolved	ug/L	2670	1000	3940	127	70-130	
Zinc, Dissolved	ug/L	10700	80	11400	819	70-130	E,M6

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QUALITY CONTROL DATA

Project: Black Pine Mine
Pace Project No.: 10156716

QC Batch: MT/5953 Analysis Method: SM 2540D
QC Batch Method: SM 2540D Analysis Description: 2540D Total Suspended Solids
Associated Lab Samples: 10156716001, 10156716002, 10156716003, 10156716004, 10156716005, 10156716006, 10156716007, 10156716008, 10156716009, 10156716010

METHOD BLANK: 973636 Matrix: Water
Associated Lab Samples: 10156716001, 10156716002, 10156716003, 10156716004, 10156716005, 10156716006, 10156716007, 10156716008, 10156716009, 10156716010

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Total Suspended Solids	mg/L	<1.0	1.0	05/10/11 08:45	

LABORATORY CONTROL SAMPLE: 973637

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Total Suspended Solids	mg/L	25	28.6	115	71-129	

SAMPLE DUPLICATE: 973638

Parameter	Units	10156585001 Result	Dup Result	RPD	Max RPD	Qualifiers
Total Suspended Solids	mg/L	281	304	8	20	

SAMPLE DUPLICATE: 973639

Parameter	Units	10156716007 Result	Dup Result	RPD	Max RPD	Qualifiers
Total Suspended Solids	mg/L	4170	3700	12	20	

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QUALITY CONTROL DATA

Project: Black Pine Mine
Pace Project No.: 10156716

QC Batch: MT/5963 Analysis Method: EPA 300.0
QC Batch Method: EPA 300.0 Analysis Description: 300.0 IC Anions
Associated Lab Samples: 10156716001, 10156716002, 10156716003, 10156716004, 10156716005, 10156716006, 10156716007, 10156716008, 10156716009, 10156716010

METHOD BLANK: 974467 Matrix: Water
Associated Lab Samples: 10156716001, 10156716002, 10156716003, 10156716004, 10156716005, 10156716006, 10156716007, 10156716008, 10156716009, 10156716010

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Sulfate	mg/L	<1.0	1.0	05/16/11 11:36	

LABORATORY CONTROL SAMPLE: 974468

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Sulfate	mg/L	20	18.6	93	90-110	

MATRIX SPIKE SAMPLE: 974470

Parameter	Units	10156915001 Result	Spike Conc.	MS Result	MS % Rec	% Rec Limits	Qualifiers
Sulfate	mg/L	542	500	1010	94	80-120	

MATRIX SPIKE SAMPLE: 974471

Parameter	Units	10156716001 Result	Spike Conc.	MS Result	MS % Rec	% Rec Limits	Qualifiers
Sulfate	mg/L	2.3	20	20.9	93	80-120	

SAMPLE DUPLICATE: 974469

Parameter	Units	10156435001 Result	Dup Result	RPD	Max RPD	Qualifiers
Sulfate	mg/L	1150	1160	1	20	

SAMPLE DUPLICATE: 974472

Parameter	Units	10156716002 Result	Dup Result	RPD	Max RPD	Qualifiers
Sulfate	mg/L	927	968	4	20	

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QUALITY CONTROL DATA

Project: Black Pine Mine
Pace Project No.: 10156716

QC Batch: WET/22267 Analysis Method: SM 2320B
QC Batch Method: SM 2320B Analysis Description: 2320B Alkalinity
Associated Lab Samples: 10156716001, 10156716002, 10156716003, 10156716004, 10156716005, 10156716006, 10156716007, 10156716008, 10156716009, 10156716010

METHOD BLANK: 974277 Matrix: Water
Associated Lab Samples: 10156716001, 10156716002, 10156716003, 10156716004, 10156716005, 10156716006, 10156716007, 10156716008, 10156716009, 10156716010

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Alkalinity, Total as CaCO3	mg/L	<5.0	5.0	05/11/11 09:24	

LABORATORY CONTROL SAMPLE & LCSD: 974278 974279

Parameter	Units	Spike Conc.	LCS Result	LCSD Result	LCS % Rec	LCSD % Rec	% Rec Limits	RPD	Max RPD	Qualifiers
Alkalinity, Total as CaCO3	mg/L	40	38.7	39.5	97	99	90-110	2	30	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 974280 974281

Parameter	Units	10156475001 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Alkalinity, Total as CaCO3	mg/L	565	40	40	599	617	86	132	80-120	3	30	M1

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 974282 974283

Parameter	Units	10156716006 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Alkalinity, Total as CaCO3	mg/L	39.0	40	40	80.7	80.5	104	104	80-120	.3	30	

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QUALITY CONTROL DATA

Project: Black Pine Mine
Pace Project No.: 10156716

QC Batch: WET/22274 Analysis Method: SM 2540C
QC Batch Method: SM 2540C Analysis Description: 2540C Total Dissolved Solids
Associated Lab Samples: 10156716001, 10156716002, 10156716003, 10156716004, 10156716005, 10156716006, 10156716007, 10156716008, 10156716009, 10156716010

METHOD BLANK: 974432 Matrix: Water
Associated Lab Samples: 10156716001, 10156716002, 10156716003, 10156716004, 10156716005, 10156716006, 10156716007, 10156716008, 10156716009, 10156716010

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Total Dissolved Solids	mg/L	<10.0	10.0	05/12/11 08:35	

LABORATORY CONTROL SAMPLE: 974433

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Total Dissolved Solids	mg/L	1000	1010	101	80-120	

SAMPLE DUPLICATE: 974434

Parameter	Units	10156585002 Result	Dup Result	RPD	Max RPD	Qualifiers
Total Dissolved Solids	mg/L	1750	1760	.5	20	

SAMPLE DUPLICATE: 974435

Parameter	Units	10156716001 Result	Dup Result	RPD	Max RPD	Qualifiers
Total Dissolved Solids	mg/L	86.0	72.0	18	20	1M

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QUALIFIERS

Project: Black Pine Mine
Pace Project No.: 10156716

DEFINITIONS

DF - Dilution Factor, if reported, represents the factor applied to the reported data due to changes in sample preparation, dilution of the sample aliquot, or moisture content.

ND - Not Detected at or above adjusted reporting limit.

J - Estimated concentration above the adjusted method detection limit and below the adjusted reporting limit.

MDL - Adjusted Method Detection Limit.

S - Surrogate

1,2-Diphenylhydrazine (8270 listed analyte) decomposes to Azobenzene.

Consistent with EPA guidelines, unrounded data are displayed and have been used to calculate % recovery and RPD values.

LCS(D) - Laboratory Control Sample (Duplicate)

MS(D) - Matrix Spike (Duplicate)

DUP - Sample Duplicate

RPD - Relative Percent Difference

NC - Not Calculable.

SG - Silica Gel - Clean-Up

U - Indicates the compound was analyzed for, but not detected.

N-Nitrosodiphenylamine decomposes and cannot be separated from Diphenylamine using Method 8270. The result reported for each analyte is a combined concentration.

LABORATORIES

PASI-M	Pace Analytical Services - Minneapolis
PASI-MT	Pace Analytical Services - Montana

ANALYTE QUALIFIERS

1M	Duplicate was analyzed out of hold for confirmation of failing RPD results of original analysis conducted within hold. Upon re-analysis the results were confirmed to original parent sample results; including passing RPD recovery. Results have been flagged and reported accordingly.
E	Analyte concentration exceeded the calibration range. The reported result is estimated.
M1	Matrix spike recovery exceeded QC limits. Batch accepted based on laboratory control sample (LCS) recovery.
M6	Matrix spike and Matrix spike duplicate recovery not evaluated against control limits due to sample dilution.

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QUALITY CONTROL DATA CROSS REFERENCE TABLE

Project: Black Pine Mine
Pace Project No.: 10156716

Lab ID	Sample ID	QC Batch Method	QC Batch	Analytical Method	Analytical Batch
10156716001	**CMMW-1**	EPA 200.8	MPRP/26002	EPA 200.8	ICPM/10641
10156716002	**CMMW-2**	EPA 200.8	MPRP/26002	EPA 200.8	ICPM/10641
10156716003	**CMMW-3**	EPA 200.8	MPRP/26002	EPA 200.8	ICPM/10641
10156716004	**CMMW-4**	EPA 200.8	MPRP/26002	EPA 200.8	ICPM/10641
10156716005	**CMMW-5**	EPA 200.8	MPRP/26002	EPA 200.8	ICPM/10641
10156716006	**CMMW-6**	EPA 200.8	MPRP/26002	EPA 200.8	ICPM/10641
10156716007	**CMMW-7**	EPA 200.8	MPRP/26002	EPA 200.8	ICPM/10641
10156716008	**CMMW-8**	EPA 200.8	MPRP/26002	EPA 200.8	ICPM/10641
10156716009	**CMMW-9**	EPA 200.8	MPRP/26002	EPA 200.8	ICPM/10641
10156716010	**FIELD DUPLICATE**	EPA 200.8	MPRP/26002	EPA 200.8	ICPM/10641
10156716001	**CMMW-1**	SM 2540D	MT/5953		
10156716002	**CMMW-2**	SM 2540D	MT/5953		
10156716003	**CMMW-3**	SM 2540D	MT/5953		
10156716004	**CMMW-4**	SM 2540D	MT/5953		
10156716005	**CMMW-5**	SM 2540D	MT/5953		
10156716006	**CMMW-6**	SM 2540D	MT/5953		
10156716007	**CMMW-7**	SM 2540D	MT/5953		
10156716008	**CMMW-8**	SM 2540D	MT/5953		
10156716009	**CMMW-9**	SM 2540D	MT/5953		
10156716010	**FIELD DUPLICATE**	SM 2540D	MT/5953		
10156716001	**CMMW-1**	EPA 300.0	MT/5963		
10156716002	**CMMW-2**	EPA 300.0	MT/5963		
10156716003	**CMMW-3**	EPA 300.0	MT/5963		
10156716004	**CMMW-4**	EPA 300.0	MT/5963		
10156716005	**CMMW-5**	EPA 300.0	MT/5963		
10156716006	**CMMW-6**	EPA 300.0	MT/5963		
10156716007	**CMMW-7**	EPA 300.0	MT/5963		
10156716008	**CMMW-8**	EPA 300.0	MT/5963		
10156716009	**CMMW-9**	EPA 300.0	MT/5963		
10156716010	**FIELD DUPLICATE**	EPA 300.0	MT/5963		
10156716001	**CMMW-1**	SM 2320B	WET/22267		
10156716002	**CMMW-2**	SM 2320B	WET/22267		
10156716003	**CMMW-3**	SM 2320B	WET/22267		
10156716004	**CMMW-4**	SM 2320B	WET/22267		
10156716005	**CMMW-5**	SM 2320B	WET/22267		
10156716006	**CMMW-6**	SM 2320B	WET/22267		
10156716007	**CMMW-7**	SM 2320B	WET/22267		
10156716008	**CMMW-8**	SM 2320B	WET/22267		
10156716009	**CMMW-9**	SM 2320B	WET/22267		
10156716010	**FIELD DUPLICATE**	SM 2320B	WET/22267		
10156716001	**CMMW-1**	SM 2540C	WET/22274		
10156716002	**CMMW-2**	SM 2540C	WET/22274		
10156716003	**CMMW-3**	SM 2540C	WET/22274		
10156716004	**CMMW-4**	SM 2540C	WET/22274		
10156716005	**CMMW-5**	SM 2540C	WET/22274		
10156716006	**CMMW-6**	SM 2540C	WET/22274		
10156716007	**CMMW-7**	SM 2540C	WET/22274		

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QUALITY CONTROL DATA CROSS REFERENCE TABLE

Project: Black Pine Mine
Pace Project No.: 10156716

Lab ID	Sample ID	QC Batch Method	QC Batch	Analytical Method	Analytical Batch
10156716008	**CMMW-8**	SM 2540C	WET/22274		
10156716009	**CMMW-9**	SM 2540C	WET/22274		
10156716010	**FIELD DUPLICATE**	SM 2540C	WET/22274		

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CHAIN-OF-CUSTODY / Analytical Request Document

The Chain-of-Custody is a LEGAL DOCUMENT. All relevant fields must be completed accurately.

Page: 1 of 1

Section A Required Client Information:

Company: Herrera
Address: 101 E. Broadway, Ste 610
Missoula, MT 59802
Email To: khourk@herreramail.com
Phone: 406 721 4204 Fax:
Requested Due Date/TAT:

Section B Required Project Information:

Report To: Kevin Hourk
Copy To: Mark Donner mdonner@blydenburgh.com
Purchase Order No.:
Project Name: Black Pine Mine
Project Number:

Section C Invoice Information:

Attention:
Company Name:
Address:
Pace Quote Reference:
Pace Project Manager: Denise Jensen
Pace Profile #:

REGULATORY AGENCY
☐ NPDES ☐ GROUND WATER ☐ DRINKING WATER
☐ UST ☐ RCRA ☐ OTHER
Site Location STATE: Montana

Requested Analysis Filtered (Y/N)

ITEM #	Section D Required Client Information — SAMPLE ID (A-Z, 0-9 / ,-) Sample IDs MUST BE UNIQUE	Valid Matrix Codes: MATRIX / CODE	MATRIX CODE (see valid codes to left)	SAMPLE TYPE (G=GRAB C=COMP)	COLLECTED: COMPOSITE START DATE	COMPOSITE START TIME	COMPOSITE END/GRAB DATE	COMPOSITE END/GRAB TIME	SAMPLE TEMP AT COLLECTION	# OF CONTAINERS	Preservatives: Unpreserved	H_2SO_4	HNO_3	HCl	NaOH	$Na_2S_2O_3$	Methanol	Other	Analysis Test Y/N	Dissolved metals*	TSS, sulfate	TDS, alkalinity	Residual Chlorine (Y/N)	Pace Project No./ Lab I.D. 10156716
1	CMMW-1	DRINKING WATER DW; WATER WT; WASTE WATER WW; PRODUCT P; SOIL/SOLID SL; OIL OL; WIPE WP; AIR AR; OTHER OT; TISSUE TS	WT		5/5/11	1700				3	2		1						x	x	x			001
2	CMMW-2		WT			1730				3	2		1						x	x	x			002
3	CMMW-3		WT			1740				3	2		1						x	x	x			003
4	CMMW-4		WT			1610				3	2		1						x	x	x			004
5	CMMW-5		WT			1800				3	2		1						x	x	x			005
6	CMMW-6		WT			1850				3	2		1						x	x	x			006
7	CMMW-7		WT			1450				3	2		1						x	x	x			007
8	CMMW-8		WT			1410				3	2		1						x	x	x			008
9	CMMW-9		WT			1630				3	2		1						x	x	x			009
10	FIELD DUPLICATE		WT			—				3	2		1						x	x	x			010
11																								
12																								

ADDITIONAL COMMENTS	RELINQUISHED BY / AFFILIATION	DATE	TIME	ACCEPTED BY / AFFILIATION	DATE	TIME	SAMPLE CONDITIONS: Temp in °C	Received on Ice (Y/N)	Custody Sealed Cooler (Y/N)	Samples Intact (Y/N)
* dissolved metals = As Cd Cu Fe Pb Mn Zn Ca Mg Na K	THC	5/6/11	1400							
	Fedex	5/7/11	10:00	Eric Schneider / Pace	5/7/11	10:00	2.4	Y	Y	Y

SAMPLER NAME AND SIGNATURE
PRINT Name of SAMPLER: Luke Duque II
SIGNATURE of SAMPLER: [signature] DATE Signed (MM/DD/YY): 5/5/11

*Important Note: By signing this form you are accepting Pace's NET 30 day payment terms and agreeing to late charges of 1.5% per month for any invoices not paid within 30 days.

Sample Condition Upon Receipt

Pace Analytical

Client Name: Herrera / MDEQ Project # 10156716

Courier: ☒ Fed Ex ☐ UPS ☐ USPS ☐ Client ☐ Commercial ☐ Pace Other _____

Tracking #: 8636069622768636795538109728

Custody Seal on Cooler/Box Present: ☒ yes ☐ no JG 5/9/11 Seals intact: ☒ yes ☐ no

Optional: Proj. Due Date: Proj. Name:

Packing Material: ☐ Bubble Wrap ☐ Bubble Bags ☒ None ☐ Other _____ Temp Blank: Yes X No _____

Thermometer Used 1383045 or 135 Type of Ice: (Wet) Blue None ☒ Samples on ice, cooling process has begun

Cooler Temperature 2.4 Biological Tissue is Frozen: Yes No

Temp should be above freezing to 6°C

Date and Initials of person examining contents: JG 5/9/11

		Comments:
Chain of Custody Present:	☒Yes ☐No ☐N/A	1.
Chain of Custody Filled Out:	☒Yes ☐No ☐N/A	2.
Chain of Custody Relinquished:	☒Yes ☐No ☐N/A	3.
Sampler Name & Signature on COC:	☒Yes ☐No ☐N/A	4.
Samples Arrived within Hold Time:	☒Yes ☐No ☐N/A	5.
Short Hold Time Analysis (<72hr):	☐Yes ☒No ☐N/A	6.
Rush Turn Around Time Requested:	☐Yes ☒No ☐N/A	7.
Sufficient Volume:	☒Yes ☐No ☐N/A	8.
Correct Containers Used:	☒Yes ☐No ☐N/A	9.
-Pace Containers Used:	☒Yes ☐No ☐N/A	
Containers Intact:	☒Yes ☐No ☐N/A	10.
Filtered volume received for Dissolved tests	☒Yes ☐No ☐N/A	11.
Sample Labels match COC:	☒Yes ☐No ☐N/A	12.
-Includes date/time/ID/Analysis Matrix: Water		
All containers needing acid/base preservation have been checked. Noncompliance are noted in 13.	☒Yes ☐No ☐N/A	13. ☒ HNO3 (1/1) ☐ H2SO4 ☐ NaOH ☐ HCl Samp #1-10
All containers needing preservation are found to be in compliance with EPA recommendation.	☒Yes ☐No ☐N/A	Initial when completed JG Lot # of added preservative
Exceptions: VOA,Coliform, TOC, Oil and Grease, WI-DRO (water)	☐Yes ☒No	
Samples checked for dechlorination:	☐Yes ☐No ☒N/A	14.
Headspace in VOA Vials (>6mm):	☐Yes ☐No ☒N/A	15.
Trip Blank Present:	☐Yes ☐No ☒N/A	16.
Trip Blank Custody Seals Present	☐Yes ☐No ☒N/A	
Pace Trip Blank Lot # (if purchased): _____		

Client Notification/ Resolution: Field Data Required? Y / N

Person Contacted: _____ Date/Time: _____

Comments/ Resolution: _____

Project Manager Review: _____ **Date:** 5/9/11

Note: Whenever there is a discrepancy affecting North Carolina compliance samples, a copy of this form will be sent to the North Carolina DEHNR Certification Office (i.e out of hold, incorrect preservative, out of temp, incorrect containers)

Pace Analytical Services, Inc.
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(406)254-7226

June 02, 2011

Kevin Houck
Herrera Environmental Consultants
101 East Broadway, Suite 610
Missoula, MT 59802

RE: Project: 776-012-002 Black Pine Mine SW
Pace Project No.: 10158290

Dear Kevin Houck:
Enclosed are the analytical results for sample(s) received by the laboratory on May 24, 2011. The results relate only to the samples included in this report.

If you have any questions concerning this report, please feel free to contact me.

Sincerely,

Denise Jensen

denise.jensen@pacelabs.com
Project Manager

Enclosures

cc: Devin Clary, Montana Dept. of Environmental Quality
Mark Donner, Trihydro

REPORT OF LABORATORY ANALYSIS

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CERTIFICATIONS

Project: 776-012-002 Black Pine Mine SW
Pace Project No.: 10158290

Minnesota Certification IDs

1700 Elm Street SE Suite 200, Minneapolis, MN 55414
A2LA Certification #: 2926.01
Alaska Certification #: UST-078
Alaska Certification #MN00064
Arizona Certification #: AZ-0014
Arkansas Certification #: 88-0680
California Certification #: 01155CA
EPA Region 8 Certification #: Pace
Florida/NELAP Certification #: E87605
Georgia Certification #: 959
Idaho Certification #: MN00064
Illinois Certification #: 200011
Iowa Certification #: 368
Kansas Certification #: E-10167
Louisiana Certification #: 03086
Louisiana Certification #: LA080009
Maine Certification #: 2007029
Maryland Certification #: 322
Michigan DEQ Certification #: 9909
Minnesota Certification #: 027-053-137
Mississippi Certification #: Pace
Montana Certification #: MT CERT0092
Nebraska Certification #: Pace
Nevada Certification #: MN_00064
New Jersey Certification #: MN-002
New Mexico Certification #: Pace
New York Certification #: 11647
North Carolina Certification #: 530
North Dakota Certification #: R-036
North Dakota Certification #: R-036A
Ohio VAP Certification #: CL101
Oklahoma Certification #: D9921
Oklahoma Certification #: 9507
Oregon Certification #: MN200001
Pennsylvania Certification #: 68-00563
Puerto Rico Certification
Tennessee Certification #: 02818
Texas Certification #: T104704192
Washington Certification #: C754
Wisconsin Certification #: 999407970

Montana Certification IDs

602 South 25th Street, Billings, MT 59101
EPA Region 8 Certification #: 8TMS-Q
Idaho Certification #: MT00012
Montana Certification #: MT CERT0040
NVLAP Certification #: 101292-0
Minnesota Dept of Health Certification #: 030-999-442

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SAMPLE SUMMARY

Project: 776-012-002 Black Pine Mine SW
Pace Project No.: 10158290

Lab ID	Sample ID	Matrix	Date Collected	Date Received
10158290001	**CPS-1**	Water	05/19/11 13:10	05/24/11 10:25
10158290002	**CPS-10A**	Water	05/19/11 11:00	05/24/11 10:25
10158290003	**CPS-2**	Water	05/19/11 12:40	05/24/11 10:25
10158290004	**CPS-7A**	Water	05/19/11 15:15	05/24/11 10:25
10158290005	**CPS-8**	Water	05/19/11 14:55	05/24/11 10:25
10158290006	**CPSW-1**	Water	05/19/11 12:20	05/24/11 10:25
10158290007	**CPSW-2**	Water	05/19/11 11:55	05/24/11 10:25
10158290008	**NORTH RUNOFF**	Water	05/19/11 13:20	05/24/11 10:25
10158290009	**TSP-10**	Water	05/19/11 16:00	05/24/11 10:25
10158290010	**BD-1**	Water	05/19/11 00:00	05/24/11 10:25
10158290011	**CPS-10B**	Water	05/19/11 13:40	05/24/11 10:25
10158290012	**CPS-11**	Water	05/19/11 13:50	05/24/11 10:25
10158290013	**ROAD CUT**	Water	05/19/11 16:20	05/24/11 10:25

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SAMPLE ANALYTE COUNT

Project: 776-012-002 Black Pine Mine SW
Pace Project No.: 10158290

Lab ID	Sample ID	Method	Analysts	Analytes Reported	Laboratory
10158290001	**CPS-1**	EPA 200.8	RJS	11	PASI-M
		SM 2310	CAC	1	PASI-MT
		SM 2540D	MP3	1	PASI-MT
		EPA 300.0	JH1	1	PASI-MT
		SM 2320B	MWD	1	PASI-M
		SM 2540C	AS1	1	PASI-M
10158290002	**CPS-10A**	EPA 200.8	RJS	11	PASI-M
		SM 2310	CAC	1	PASI-MT
		SM 2540D	MP3	1	PASI-MT
		EPA 300.0	JH1	1	PASI-MT
		SM 2320B	MWD	1	PASI-M
		SM 2540C	AS1	1	PASI-M
10158290003	**CPS-2**	EPA 200.8	RJS	11	PASI-M
		SM 2310	CAC	1	PASI-MT
		SM 2540D	MP3	1	PASI-MT
		EPA 300.0	JH1	1	PASI-MT
		SM 2320B	MWD	1	PASI-M
		SM 2540C	AS1	1	PASI-M
10158290004	**CPS-7A**	EPA 200.8	RJS	11	PASI-M
		SM 2310	CAC	1	PASI-MT
		SM 2540D	MP3	1	PASI-MT
		EPA 300.0	JH1	1	PASI-MT
		SM 2320B	MWD	1	PASI-M
		SM 2540C	AS1	1	PASI-M
10158290005	**CPS-8**	EPA 200.8	RJS	11	PASI-M
		SM 2310	CAC	1	PASI-MT
		SM 2540D	MP3	1	PASI-MT
		EPA 300.0	JH1	1	PASI-MT
		SM 2320B	MWD	1	PASI-M
		SM 2540C	AS1	1	PASI-M
10158290006	**CPSW-1**	EPA 200.8	RJS	11	PASI-M
		SM 2310	CAC	1	PASI-MT
		SM 2540D	MP3	1	PASI-MT
		EPA 300.0	JH1	1	PASI-MT
		SM 2320B	MWD	1	PASI-M
		SM 2540C	AS1	1	PASI-M
10158290007	**CPSW-2**	EPA 200.8	RJS	11	PASI-M

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SAMPLE ANALYTE COUNT

Project: 776-012-002 Black Pine Mine SW
Pace Project No.: 10158290

Lab ID	Sample ID	Method	Analysts	Analytes Reported	Laboratory
		SM 2310	CAC	1	PASI-MT
		SM 2540D	MP3	1	PASI-MT
		EPA 300.0	JH1	1	PASI-MT
		SM 2320B	MWD	1	PASI-M
		SM 2540C	AS1	1	PASI-M
10158290008	**NORTH RUNOFF**	EPA 200.8	RJS	11	PASI-M
		SM 2310	CAC	1	PASI-MT
		SM 2540D	MP3	1	PASI-MT
		EPA 300.0	JH1	1	PASI-MT
		SM 2320B	MWD	1	PASI-M
		SM 2540C	AS1	1	PASI-M
10158290009	**TSP-10**	EPA 200.8	RJS	11	PASI-M
		SM 2310	CAC	1	PASI-MT
		SM 2540D	MP3	1	PASI-MT
		EPA 300.0	JH1	1	PASI-MT
		SM 2320B	MWD	1	PASI-M
		SM 2540C	AS1	1	PASI-M
10158290010	**BD-1**	EPA 200.8	RJS	11	PASI-M
		SM 2310	CAC	1	PASI-MT
		SM 2540D	MP3	1	PASI-MT
		EPA 300.0	JH1	1	PASI-MT
		SM 2320B	MWD	1	PASI-M
		SM 2540C	CAP	1	PASI-M
10158290011	**CPS-10B**	EPA 200.8	RJS	11	PASI-M
		SM 2310	CAC	1	PASI-MT
		SM 2540D	MP3	1	PASI-MT
		EPA 300.0	JH1	1	PASI-MT
		SM 2320B	MWD	1	PASI-M
		SM 2540C	CAP	1	PASI-M
10158290012	**CPS-11**	EPA 200.8	RJS	11	PASI-M
		SM 2310	CAC	1	PASI-MT
		SM 2540D	MP3	1	PASI-MT
		EPA 300.0	JH1	1	PASI-MT
		SM 2320B	MWD	1	PASI-M
		SM 2540C	CAP	1	PASI-M
10158290013	**ROAD CUT**	EPA 200.8	RJS	11	PASI-M
		SM 2310	CAC	1	PASI-MT

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SAMPLE ANALYTE COUNT

Project: 776-012-002 Black Pine Mine SW
Pace Project No.: 10158290

Lab ID	Sample ID	Method	Analysts	Analytes Reported	Laboratory
		SM 2540D	MP3	1	PASI-MT
		EPA 300.0	JH1	1	PASI-MT
		SM 2320B	MWD	1	PASI-M
		SM 2540C	CAP	1	PASI-M

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PROJECT NARRATIVE

Project: 776-012-002 Black Pine Mine SW
Pace Project No.: 10158290

Method: **EPA 200.8**
Description: 200.8 MET ICPMS, Dissolved
Client: Montana Dept. of Environmental Quality
Date: June 02, 2011

General Information:
13 samples were analyzed for EPA 200.8. All samples were received in acceptable condition with any exceptions noted below.

Hold Time:
The samples were analyzed within the method required hold times with any exceptions noted below.

Sample Preparation:
The samples were prepared in accordance with EPA 200.8 with any exceptions noted below.

Initial Calibrations (including MS Tune as applicable):
All criteria were within method requirements with any exceptions noted below.

Continuing Calibration:
All criteria were within method requirements with any exceptions noted below.

Internal Standards:
All internal standards were within QC limits with any exceptions noted below.

Method Blank:
All analytes were below the report limit in the method blank with any exceptions noted below.

Laboratory Control Spike:
All laboratory control spike compounds were within QC limits with any exceptions noted below.

Matrix Spikes:
All percent recoveries and relative percent differences (RPDs) were within acceptance criteria with any exceptions noted below.

QC Batch: MPRP/26262

A matrix spike and matrix spike duplicate (MS/MSD) were performed on the following sample(s): 10158057002,10158290007

M1: Matrix spike recovery exceeded QC limits. Batch accepted based on laboratory control sample (LCS) recovery.

- MS (Lab ID: 982837)
  - Calcium, Dissolved
- MS (Lab ID: 982838)
  - Calcium, Dissolved
  - Iron, Dissolved
  - Magnesium, Dissolved
  - Potassium, Dissolved
  - Zinc, Dissolved
- MSD (Lab ID: 982839)
  - Calcium, Dissolved
  - Copper, Dissolved
  - Iron, Dissolved
  - Magnesium, Dissolved
  - Potassium, Dissolved

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PROJECT NARRATIVE

Project: 776-012-002 Black Pine Mine SW
Pace Project No.: 10158290

Method: **EPA 200.8**
Description: 200.8 MET ICPMS, Dissolved
Client: Montana Dept. of Environmental Quality
Date: June 02, 2011

QC Batch: MPRP/26262

A matrix spike and matrix spike duplicate (MS/MSD) were performed on the following sample(s): 10158057002,10158290007

M1: Matrix spike recovery exceeded QC limits. Batch accepted based on laboratory control sample (LCS) recovery.

- Sodium, Dissolved
- Zinc, Dissolved

Duplicate Sample:
All duplicate sample results were within method acceptance criteria with any exceptions noted below.

Additional Comments:

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PROJECT NARRATIVE

Project: 776-012-002 Black Pine Mine SW
Pace Project No.: 10158290

Method: **SM 2310**
Description: 2310 Acidity
Client: Montana Dept. of Environmental Quality
Date: June 02, 2011

General Information:
13 samples were analyzed for SM 2310. All samples were received in acceptable condition with any exceptions noted below.

Hold Time:
The samples were analyzed within the method required hold times with any exceptions noted below.

Initial Calibrations (including MS Tune as applicable):
All criteria were within method requirements with any exceptions noted below.

Continuing Calibration:
All criteria were within method requirements with any exceptions noted below.

Internal Standards:
All internal standards were within QC limits with any exceptions noted below.

Surrogates:
All surrogates were within QC limits with any exceptions noted below.

Method Blank:
All analytes were below the report limit in the method blank with any exceptions noted below.

Laboratory Control Spike:
All laboratory control spike compounds were within QC limits with any exceptions noted below.

Matrix Spikes:
All percent recoveries and relative percent differences (RPDs) were within acceptance criteria with any exceptions noted below.

Duplicate Sample:
All duplicate sample results were within method acceptance criteria with any exceptions noted below.

QC Batch: MT/6058

R1: RPD value was outside control limits.

- DUP (Lab ID: 983751)
  - Acidity

Additional Comments:

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PROJECT NARRATIVE

Project: 776-012-002 Black Pine Mine SW
Pace Project No.: 10158290

Method: **SM 2540D**
Description: 2540D Total Suspended Solids
Client: Montana Dept. of Environmental Quality
Date: June 02, 2011

General Information:
13 samples were analyzed for SM 2540D. All samples were received in acceptable condition with any exceptions noted below.

Hold Time:
The samples were analyzed within the method required hold times with any exceptions noted below.

Initial Calibrations (including MS Tune as applicable):
All criteria were within method requirements with any exceptions noted below.

Continuing Calibration:
All criteria were within method requirements with any exceptions noted below.

Internal Standards:
All internal standards were within QC limits with any exceptions noted below.

Surrogates:
All surrogates were within QC limits with any exceptions noted below.

Method Blank:
All analytes were below the report limit in the method blank with any exceptions noted below.

Laboratory Control Spike:
All laboratory control spike compounds were within QC limits with any exceptions noted below.

Matrix Spikes:
All percent recoveries and relative percent differences (RPDs) were within acceptance criteria with any exceptions noted below.

Duplicate Sample:
All duplicate sample results were within method acceptance criteria with any exceptions noted below.

QC Batch: MT/6046

D6: The relative percent difference (RPD) between the sample and sample duplicate exceeded laboratory control limits.

- DUP (Lab ID: 982519)
  - Total Suspended Solids

Additional Comments:

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PROJECT NARRATIVE

Project: 776-012-002 Black Pine Mine SW
Pace Project No.: 10158290

Method: **EPA 300.0**
Description: 300.0 IC Anions
Client: Montana Dept. of Environmental Quality
Date: June 02, 2011

General Information:
13 samples were analyzed for EPA 300.0. All samples were received in acceptable condition with any exceptions noted below.

Hold Time:
The samples were analyzed within the method required hold times with any exceptions noted below.

Initial Calibrations (including MS Tune as applicable):
All criteria were within method requirements with any exceptions noted below.

Continuing Calibration:
All criteria were within method requirements with any exceptions noted below.

Internal Standards:
All internal standards were within QC limits with any exceptions noted below.

Surrogates:
All surrogates were within QC limits with any exceptions noted below.

Method Blank:
All analytes were below the report limit in the method blank with any exceptions noted below.

Laboratory Control Spike:
All laboratory control spike compounds were within QC limits with any exceptions noted below.

Matrix Spikes:
All percent recoveries and relative percent differences (RPDs) were within acceptance criteria with any exceptions noted below.

Duplicate Sample:
All duplicate sample results were within method acceptance criteria with any exceptions noted below.

Additional Comments:

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PROJECT NARRATIVE

Project: 776-012-002 Black Pine Mine SW
Pace Project No.: 10158290

Method: **SM 2320B**
Description: 2320B Alkalinity
Client: Montana Dept. of Environmental Quality
Date: June 02, 2011

General Information:
13 samples were analyzed for SM 2320B. All samples were received in acceptable condition with any exceptions noted below.

Hold Time:
The samples were analyzed within the method required hold times with any exceptions noted below.

Method Blank:
All analytes were below the report limit in the method blank with any exceptions noted below.

Laboratory Control Spike:
All laboratory control spike compounds were within QC limits with any exceptions noted below.

Matrix Spikes:
All percent recoveries and relative percent differences (RPDs) were within acceptance criteria with any exceptions noted below.

Duplicate Sample:
All duplicate sample results were within method acceptance criteria with any exceptions noted below.

Additional Comments:

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PROJECT NARRATIVE

Project: 776-012-002 Black Pine Mine SW
Pace Project No.: 10158290

Method: **SM 2540C**
Description: 2540C Total Dissolved Solids
Client: Montana Dept. of Environmental Quality
Date: June 02, 2011

General Information:
13 samples were analyzed for SM 2540C. All samples were received in acceptable condition with any exceptions noted below.

Hold Time:
The samples were analyzed within the method required hold times with any exceptions noted below.

Method Blank:
All analytes were below the report limit in the method blank with any exceptions noted below.

Laboratory Control Spike:
All laboratory control spike compounds were within QC limits with any exceptions noted below.

Matrix Spikes:
All percent recoveries and relative percent differences (RPDs) were within acceptance criteria with any exceptions noted below.

Duplicate Sample:
All duplicate sample results were within method acceptance criteria with any exceptions noted below.

Additional Comments:

This data package has been reviewed for quality and completeness and is approved for release.

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ANALYTICAL RESULTS

Project: 776-012-002 Black Pine Mine SW
Pace Project No.: 10158290

Sample: CPS-1 **Lab ID: 10158290001** Collected: 05/19/11 13:10 Received: 05/24/11 10:25 Matrix: Water

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
200.8 MET ICPMS, Dissolved	Analytical Method: EPA 200.8 Preparation Method: EPA 200.8							
Arsenic, Dissolved	**<0.50**	ug/L	0.50	1	05/25/11 14:56	05/27/11 19:08	7440-38-2	
Cadmium, Dissolved	**173**	ug/L	0.080	1	05/25/11 14:56	05/27/11 19:08	7440-43-9	
Calcium, Dissolved	**65400**	ug/L	100	5	05/25/11 14:56	05/27/11 19:13	7440-70-2	
Copper, Dissolved	**11100**	ug/L	25.0	50	05/25/11 14:56	05/31/11 13:22	7440-50-8	
Iron, Dissolved	**<50.0**	ug/L	50.0	1	05/25/11 14:56	05/27/11 19:08	7439-89-6	
Lead, Dissolved	**0.30**	ug/L	0.10	1	05/25/11 14:56	05/27/11 19:08	7439-92-1	
Magnesium, Dissolved	**27300**	ug/L	25.0	5	05/25/11 14:56	05/27/11 19:13	7439-95-4	
Manganese, Dissolved	**3680**	ug/L	25.0	50	05/25/11 14:56	05/31/11 13:22	7439-96-5	
Potassium, Dissolved	**3690**	ug/L	20.0	1	05/25/11 14:56	05/27/11 19:08	7440-09-7	
Sodium, Dissolved	**6450**	ug/L	50.0	1	05/25/11 14:56	05/27/11 19:08	7440-23-5	
Zinc, Dissolved	**12600**	ug/L	250	50	05/25/11 14:56	05/31/11 13:22	7440-66-6	
2310 Acidity	Analytical Method: SM 2310							
Acidity	**84.8**	mg/L	5.0	1		05/27/11 17:20		
2540D Total Suspended Solids	Analytical Method: SM 2540D							
Total Suspended Solids	**1.2**	mg/L	1.0	1		05/25/11 11:00		
300.0 IC Anions	Analytical Method: EPA 300.0							
Sulfate	**294**	mg/L	25.0	25		05/31/11 22:01	14808-79-8	
2320B Alkalinity	Analytical Method: SM 2320B							
Alkalinity, Total as CaCO3	**<5.0**	mg/L	5.0	1		05/26/11 11:39		
2540C Total Dissolved Solids	Analytical Method: SM 2540C							
Total Dissolved Solids	**584**	mg/L	10.0	1		05/25/11 14:08		

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ANALYTICAL RESULTS

Project: 776-012-002 Black Pine Mine SW
Pace Project No.: 10158290

Sample: CPS-10A **Lab ID: 10158290002** Collected: 05/19/11 11:00 Received: 05/24/11 10:25 Matrix: Water

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
200.8 MET ICPMS, Dissolved	Analytical Method: EPA 200.8 Preparation Method: EPA 200.8							
Arsenic, Dissolved	**2.9**	ug/L	0.50	1	05/25/11 14:56	05/27/11 19:18	7440-38-2	
Cadmium, Dissolved	**215**	ug/L	0.080	1	05/25/11 14:56	05/27/11 19:18	7440-43-9	
Calcium, Dissolved	**20000**	ug/L	20.0	1	05/25/11 14:56	05/27/11 19:18	7440-70-2	
Copper, Dissolved	**20900**	ug/L	25.0	50	05/25/11 14:56	05/31/11 02:34	7440-50-8	
Iron, Dissolved	**1140**	ug/L	50.0	1	05/25/11 14:56	05/27/11 19:18	7439-89-6	
Lead, Dissolved	**34.3**	ug/L	0.10	1	05/25/11 14:56	05/27/11 19:18	7439-92-1	
Magnesium, Dissolved	**9020**	ug/L	5.0	1	05/25/11 14:56	05/27/11 19:18	7439-95-4	
Manganese, Dissolved	**6640**	ug/L	25.0	50	05/25/11 14:56	05/31/11 02:34	7439-96-5	
Potassium, Dissolved	**2100**	ug/L	20.0	1	05/25/11 14:56	05/27/11 19:18	7440-09-7	
Sodium, Dissolved	**4180**	ug/L	50.0	1	05/25/11 14:56	05/27/11 19:18	7440-23-5	
Zinc, Dissolved	**20400**	ug/L	250	50	05/25/11 14:56	05/31/11 02:34	7440-66-6	
2310 Acidity	Analytical Method: SM 2310							
Acidity	**75.7**	mg/L	5.0	1		05/27/11 17:20		
2540D Total Suspended Solids	Analytical Method: SM 2540D							
Total Suspended Solids	**76.8**	mg/L	2.0	1		05/25/11 11:00		
300.0 IC Anions	Analytical Method: EPA 300.0							
Sulfate	**169**	mg/L	5.0	5		05/31/11 22:58	14808-79-8	
2320B Alkalinity	Analytical Method: SM 2320B							
Alkalinity, Total as CaCO3	**<5.0**	mg/L	5.0	1		05/26/11 11:41		
2540C Total Dissolved Solids	Analytical Method: SM 2540C							
Total Dissolved Solids	**284**	mg/L	10.0	1		05/25/11 14:09		

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ANALYTICAL RESULTS

Project: 776-012-002 Black Pine Mine SW
Pace Project No.: 10158290

Sample: CPS-2 **Lab ID: 10158290003** Collected: 05/19/11 12:40 Received: 05/24/11 10:25 Matrix: Water

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
200.8 MET ICPMS, Dissolved	Analytical Method: EPA 200.8 Preparation Method: EPA 200.8							
Arsenic, Dissolved	**3.5**	ug/L	0.50	1	05/25/11 14:56	05/27/11 19:37	7440-38-2	
Cadmium, Dissolved	**0.17**	ug/L	0.080	1	05/25/11 14:56	05/27/11 19:37	7440-43-9	
Calcium, Dissolved	**5160**	ug/L	20.0	1	05/25/11 14:56	05/27/11 19:37	7440-70-2	
Copper, Dissolved	**21.2**	ug/L	0.50	1	05/25/11 14:56	05/27/11 19:37	7440-50-8	
Iron, Dissolved	**1580**	ug/L	50.0	1	05/25/11 14:56	05/27/11 19:37	7439-89-6	
Lead, Dissolved	**6.6**	ug/L	0.10	1	05/25/11 14:56	05/27/11 19:37	7439-92-1	
Magnesium, Dissolved	**1760**	ug/L	5.0	1	05/25/11 14:56	05/27/11 19:37	7439-95-4	
Manganese, Dissolved	**13.9**	ug/L	0.50	1	05/25/11 14:56	05/27/11 19:37	7439-96-5	
Potassium, Dissolved	**1660**	ug/L	20.0	1	05/25/11 14:56	05/27/11 19:37	7440-09-7	
Sodium, Dissolved	**3000**	ug/L	100	2	05/25/11 14:56	05/31/11 02:39	7440-23-5	
Zinc, Dissolved	**20.2**	ug/L	5.0	1	05/25/11 14:56	05/27/11 19:37	7440-66-6	
2310 Acidity	Analytical Method: SM 2310							
Acidity	**17.9**	mg/L	5.0	1		05/27/11 17:20		
2540D Total Suspended Solids	Analytical Method: SM 2540D							
Total Suspended Solids	**2.2**	mg/L	1.0	1		05/25/11 11:00		
300.0 IC Anions	Analytical Method: EPA 300.0							
Sulfate	**6.1**	mg/L	2.0	2		05/27/11 16:55	14808-79-8	
2320B Alkalinity	Analytical Method: SM 2320B							
Alkalinity, Total as CaCO3	**16.4**	mg/L	5.0	1		05/26/11 11:46		
2540C Total Dissolved Solids	Analytical Method: SM 2540C							
Total Dissolved Solids	**98.0**	mg/L	10.0	1		05/25/11 14:10		

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ANALYTICAL RESULTS

Project: 776-012-002 Black Pine Mine SW
Pace Project No.: 10158290

Sample: CPS-7A **Lab ID: 10158290004** Collected: 05/19/11 15:15 Received: 05/24/11 10:25 Matrix: Water

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
200.8 MET ICPMS, Dissolved	Analytical Method: EPA 200.8 Preparation Method: EPA 200.8							
Arsenic, Dissolved	**54.7**	ug/L	0.50	1	05/25/11 14:56	05/27/11 19:47	7440-38-2	
Cadmium, Dissolved	**52.9**	ug/L	0.080	1	05/25/11 14:56	05/27/11 19:47	7440-43-9	
Calcium, Dissolved	**28200**	ug/L	100	5	05/25/11 14:56	05/27/11 19:51	7440-70-2	
Copper, Dissolved	**4320**	ug/L	5.0	10	05/25/11 14:56	05/31/11 02:44	7440-50-8	
Iron, Dissolved	**41400**	ug/L	250	5	05/25/11 14:56	05/27/11 19:51	7439-89-6	
Lead, Dissolved	**363**	ug/L	0.10	1	05/25/11 14:56	05/27/11 19:47	7439-92-1	
Magnesium, Dissolved	**16700**	ug/L	5.0	1	05/25/11 14:56	05/27/11 19:47	7439-95-4	
Manganese, Dissolved	**938**	ug/L	2.5	5	05/25/11 14:56	05/27/11 19:51	7439-96-5	
Potassium, Dissolved	**7140**	ug/L	20.0	1	05/25/11 14:56	05/27/11 19:47	7440-09-7	
Sodium, Dissolved	**3720**	ug/L	250	5	05/25/11 14:56	05/27/11 19:51	7440-23-5	
Zinc, Dissolved	**4650**	ug/L	250	50	05/25/11 14:56	05/31/11 13:27	7440-66-6	
2310 Acidity	Analytical Method: SM 2310							
Acidity	**37.3**	mg/L	5.0	1		05/27/11 17:20		R1
2540D Total Suspended Solids	Analytical Method: SM 2540D							
Total Suspended Solids	**2670**	mg/L	20.4	1		05/25/11 11:00		
300.0 IC Anions	Analytical Method: EPA 300.0							
Sulfate	**75.6**	mg/L	5.0	5		05/27/11 18:29	14808-79-8	
2320B Alkalinity	Analytical Method: SM 2320B							
Alkalinity, Total as CaCO3	**<5.0**	mg/L	5.0	1		05/26/11 11:49		
2540C Total Dissolved Solids	Analytical Method: SM 2540C							
Total Dissolved Solids	**320**	mg/L	33.3	1		05/25/11 14:10		

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ANALYTICAL RESULTS

Project: 776-012-002 Black Pine Mine SW
Pace Project No.: 10158290

Sample: CPS-8 **Lab ID: 10158290005** Collected: 05/19/11 14:55 Received: 05/24/11 10:25 Matrix: Water

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
200.8 MET ICPMS, Dissolved	Analytical Method: EPA 200.8 Preparation Method: EPA 200.8							
Arsenic, Dissolved	**3.8**	ug/L	0.50	1	05/25/11 14:56	05/27/11 19:56	7440-38-2	
Cadmium, Dissolved	**7.8**	ug/L	0.080	1	05/25/11 14:56	05/27/11 19:56	7440-43-9	
Calcium, Dissolved	**10300**	ug/L	20.0	1	05/25/11 14:56	05/27/11 19:56	7440-70-2	
Copper, Dissolved	**339**	ug/L	0.50	1	05/25/11 14:56	05/27/11 19:56	7440-50-8	
Iron, Dissolved	**1950**	ug/L	50.0	1	05/25/11 14:56	05/27/11 19:56	7439-89-6	
Lead, Dissolved	**7.7**	ug/L	0.10	1	05/25/11 14:56	05/27/11 19:56	7439-92-1	
Magnesium, Dissolved	**3820**	ug/L	5.0	1	05/25/11 14:56	05/27/11 19:56	7439-95-4	
Manganese, Dissolved	**31.9**	ug/L	0.50	1	05/25/11 14:56	05/27/11 19:56	7439-96-5	
Potassium, Dissolved	**1770**	ug/L	20.0	1	05/25/11 14:56	05/27/11 19:56	7440-09-7	
Sodium, Dissolved	**3900**	ug/L	100	2	05/25/11 14:56	05/31/11 02:58	7440-23-5	
Zinc, Dissolved	**361**	ug/L	5.0	1	05/25/11 14:56	05/27/11 19:56	7440-66-6	
2310 Acidity	Analytical Method: SM 2310							
Acidity	**23.7**	mg/L	5.0	1		05/27/11 17:20		
2540D Total Suspended Solids	Analytical Method: SM 2540D							
Total Suspended Solids	**258**	mg/L	4.1	1		05/25/11 11:00		
300.0 IC Anions	Analytical Method: EPA 300.0							
Sulfate	**19.6**	mg/L	3.0	3		05/27/11 18:57	14808-79-8	
2320B Alkalinity	Analytical Method: SM 2320B							
Alkalinity, Total as CaCO3	**22.5**	mg/L	5.0	1		05/26/11 11:51		
2540C Total Dissolved Solids	Analytical Method: SM 2540C							
Total Dissolved Solids	**122**	mg/L	20.0	1		05/25/11 14:11		

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ANALYTICAL RESULTS

Project: 776-012-002 Black Pine Mine SW
Pace Project No.: 10158290

Sample: CPSW-1 **Lab ID: 10158290006** Collected: 05/19/11 12:20 Received: 05/24/11 10:25 Matrix: Water

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
200.8 MET ICPMS, Dissolved	Analytical Method: EPA 200.8 Preparation Method: EPA 200.8							
Arsenic, Dissolved	**3.1**	ug/L	0.50	1	05/25/11 14:56	05/27/11 20:35	7440-38-2	
Cadmium, Dissolved	**2.2**	ug/L	0.080	1	05/25/11 14:56	05/27/11 20:35	7440-43-9	
Calcium, Dissolved	**6200**	ug/L	20.0	1	05/25/11 14:56	05/27/11 20:35	7440-70-2	
Copper, Dissolved	**89.9**	ug/L	0.50	1	05/25/11 14:56	05/27/11 20:35	7440-50-8	
Iron, Dissolved	**1380**	ug/L	50.0	1	05/25/11 14:56	05/27/11 20:35	7439-89-6	
Lead, Dissolved	**4.6**	ug/L	0.10	1	05/25/11 14:56	05/27/11 20:35	7439-92-1	
Magnesium, Dissolved	**2130**	ug/L	5.0	1	05/25/11 14:56	05/27/11 20:35	7439-95-4	
Manganese, Dissolved	**26.7**	ug/L	0.50	1	05/25/11 14:56	05/27/11 20:35	7439-96-5	
Potassium, Dissolved	**1920**	ug/L	20.0	1	05/25/11 14:56	05/27/11 20:35	7440-09-7	
Sodium, Dissolved	**3200**	ug/L	100	2	05/25/11 14:56	05/31/11 03:03	7440-23-5	
Zinc, Dissolved	**184**	ug/L	5.0	1	05/25/11 14:56	05/27/11 20:35	7440-66-6	
2310 Acidity	Analytical Method: SM 2310							
Acidity	**26.6**	mg/L	5.0	1		05/27/11 17:20		
2540D Total Suspended Solids	Analytical Method: SM 2540D							
Total Suspended Solids	**5.0**	mg/L	1.3	1		05/25/11 11:00		
300.0 IC Anions	Analytical Method: EPA 300.0							
Sulfate	**14.8**	mg/L	2.0	2		05/27/11 20:51	14808-79-8	
2320B Alkalinity	Analytical Method: SM 2320B							
Alkalinity, Total as CaCO3	**12.8**	mg/L	5.0	1		05/26/11 12:02		
2540C Total Dissolved Solids	Analytical Method: SM 2540C							
Total Dissolved Solids	**104**	mg/L	10.0	1		05/25/11 14:12		

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ANALYTICAL RESULTS

Project: 776-012-002 Black Pine Mine SW
Pace Project No.: 10158290

Sample: CPSW-2 **Lab ID: 10158290007** Collected: 05/19/11 11:55 Received: 05/24/11 10:25 Matrix: Water

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
200.8 MET ICPMS, Dissolved	Analytical Method: EPA 200.8 Preparation Method: EPA 200.8							
Arsenic, Dissolved	**2.3**	ug/L	0.50	1	05/25/11 14:56	05/27/11 20:06	7440-38-2	
Cadmium, Dissolved	**2.3**	ug/L	0.080	1	05/25/11 14:56	05/27/11 20:06	7440-43-9	
Calcium, Dissolved	**6960**	ug/L	20.0	1	05/25/11 14:56	05/27/11 20:06	7440-70-2	M1
Copper, Dissolved	**126**	ug/L	0.50	1	05/25/11 14:56	05/27/11 20:06	7440-50-8	M1
Iron, Dissolved	**777**	ug/L	50.0	1	05/25/11 14:56	05/27/11 20:06	7439-89-6	M1
Lead, Dissolved	**3.1**	ug/L	0.10	1	05/25/11 14:56	05/27/11 20:06	7439-92-1	
Magnesium, Dissolved	**2320**	ug/L	5.0	1	05/25/11 14:56	05/27/11 20:06	7439-95-4	M1
Manganese, Dissolved	**19.3**	ug/L	0.50	1	05/25/11 14:56	05/27/11 20:06	7439-96-5	
Potassium, Dissolved	**2030**	ug/L	20.0	1	05/25/11 14:56	05/27/11 20:06	7440-09-7	M1
Sodium, Dissolved	**3280**	ug/L	100	2	05/25/11 14:56	05/31/11 03:07	7440-23-5	M1
Zinc, Dissolved	**199**	ug/L	5.0	1	05/25/11 14:56	05/27/11 20:06	7440-66-6	M1
2310 Acidity	Analytical Method: SM 2310							
Acidity	**36.3**	mg/L	5.0	1		05/27/11 17:20		
2540D Total Suspended Solids	Analytical Method: SM 2540D							
Total Suspended Solids	**4.5**	mg/L	1.0	1		05/25/11 11:00		
300.0 IC Anions	Analytical Method: EPA 300.0							
Sulfate	**21.9**	mg/L	2.0	2		05/27/11 21:19	14808-79-8	
2320B Alkalinity	Analytical Method: SM 2320B							
Alkalinity, Total as CaCO3	**10.2**	mg/L	5.0	1		05/26/11 12:05		
2540C Total Dissolved Solids	Analytical Method: SM 2540C							
Total Dissolved Solids	**116**	mg/L	10.0	1		05/25/11 14:13		

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ANALYTICAL RESULTS

Project: 776-012-002 Black Pine Mine SW
Pace Project No.: 10158290

Sample: NORTH RUNOFF **Lab ID: 10158290008** Collected: 05/19/11 13:20 Received: 05/24/11 10:25 Matrix: Water

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
200.8 MET ICPMS, Dissolved	Analytical Method: EPA 200.8 Preparation Method: EPA 200.8							
Arsenic, Dissolved	**2.1**	ug/L	0.50	1	05/25/11 14:56	05/27/11 20:44	7440-38-2	
Cadmium, Dissolved	**17.9**	ug/L	0.080	1	05/25/11 14:56	05/27/11 20:44	7440-43-9	
Calcium, Dissolved	**16600**	ug/L	20.0	1	05/25/11 14:56	05/27/11 20:44	7440-70-2	
Copper, Dissolved	**666**	ug/L	2.5	5	05/25/11 14:56	05/31/11 03:22	7440-50-8	
Iron, Dissolved	**1460**	ug/L	50.0	1	05/25/11 14:56	05/27/11 20:44	7439-89-6	
Lead, Dissolved	**3.2**	ug/L	0.10	1	05/25/11 14:56	05/27/11 20:44	7439-92-1	
Magnesium, Dissolved	**6460**	ug/L	5.0	1	05/25/11 14:56	05/27/11 20:44	7439-95-4	
Manganese, Dissolved	**152**	ug/L	0.50	1	05/25/11 14:56	05/27/11 20:44	7439-96-5	
Potassium, Dissolved	**2210**	ug/L	20.0	1	05/25/11 14:56	05/27/11 20:44	7440-09-7	
Sodium, Dissolved	**3800**	ug/L	250	5	05/25/11 14:56	05/31/11 03:22	7440-23-5	
Zinc, Dissolved	**1310**	ug/L	25.0	5	05/25/11 14:56	05/31/11 03:22	7440-66-6	
2310 Acidity	Analytical Method: SM 2310							
Acidity	**36.3**	mg/L	5.0	1		05/27/11 17:20		
2540D Total Suspended Solids	Analytical Method: SM 2540D							
Total Suspended Solids	**26.9**	mg/L	1.0	1		05/25/11 11:00		
300.0 IC Anions	Analytical Method: EPA 300.0							
Sulfate	**60.5**	mg/L	2.0	2		05/27/11 21:48	14808-79-8	
2320B Alkalinity	Analytical Method: SM 2320B							
Alkalinity, Total as CaCO3	**10.5**	mg/L	5.0	1		05/26/11 12:09		
2540C Total Dissolved Solids	Analytical Method: SM 2540C							
Total Dissolved Solids	**161**	mg/L	10.0	1		05/25/11 14:13		

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ANALYTICAL RESULTS

Project: 776-012-002 Black Pine Mine SW
Pace Project No.: 10158290

Sample: TSP-10 **Lab ID: 10158290009** Collected: 05/19/11 16:00 Received: 05/24/11 10:25 Matrix: Water

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
200.8 MET ICPMS, Dissolved	Analytical Method: EPA 200.8 Preparation Method: EPA 200.8							
Arsenic, Dissolved	**2.0**	ug/L	0.50	1	05/25/11 14:56	05/27/11 20:54	7440-38-2	
Cadmium, Dissolved	**0.080**	ug/L	0.080	1	05/25/11 14:56	05/27/11 20:54	7440-43-9	
Calcium, Dissolved	**3280**	ug/L	20.0	1	05/25/11 14:56	05/27/11 20:54	7440-70-2	
Copper, Dissolved	**6.3**	ug/L	0.50	1	05/25/11 14:56	05/27/11 20:54	7440-50-8	
Iron, Dissolved	**2990**	ug/L	50.0	1	05/25/11 14:56	05/27/11 20:54	7439-89-6	
Lead, Dissolved	**2.7**	ug/L	0.10	1	05/25/11 14:56	05/27/11 20:54	7439-92-1	
Magnesium, Dissolved	**2130**	ug/L	5.0	1	05/25/11 14:56	05/27/11 20:54	7439-95-4	
Manganese, Dissolved	**52.6**	ug/L	0.50	1	05/25/11 14:56	05/27/11 20:54	7439-96-5	
Potassium, Dissolved	**1500**	ug/L	20.0	1	05/25/11 14:56	05/27/11 20:54	7440-09-7	
Sodium, Dissolved	**2050**	ug/L	100	2	05/25/11 14:56	05/31/11 03:27	7440-23-5	
Zinc, Dissolved	**17.1**	ug/L	5.0	1	05/25/11 14:56	05/27/11 20:54	7440-66-6	
2310 Acidity	Analytical Method: SM 2310							
Acidity	**<5.0**	mg/L	5.0	1		05/27/11 17:20		
2540D Total Suspended Solids	Analytical Method: SM 2540D							
Total Suspended Solids	**28.1**	mg/L	1.3	1		05/25/11 11:00		
300.0 IC Anions	Analytical Method: EPA 300.0							
Sulfate	**3.3**	mg/L	3.0	3		05/27/11 22:16	14808-79-8	
2320B Alkalinity	Analytical Method: SM 2320B							
Alkalinity, Total as CaCO3	**13.8**	mg/L	5.0	1		05/26/11 12:52		
2540C Total Dissolved Solids	Analytical Method: SM 2540C							
Total Dissolved Solids	**100**	mg/L	10.0	1		05/25/11 14:14		

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ANALYTICAL RESULTS

Project: 776-012-002 Black Pine Mine SW
Pace Project No.: 10158290

Sample: BD-1 **Lab ID: 10158290010** Collected: 05/19/11 00:00 Received: 05/24/11 10:25 Matrix: Water

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
200.8 MET ICPMS, Dissolved	Analytical Method: EPA 200.8 Preparation Method: EPA 200.8							
Arsenic, Dissolved	**2.0**	ug/L	0.50	1	05/25/11 14:56	05/27/11 21:03	7440-38-2	
Cadmium, Dissolved	**13.7**	ug/L	0.080	1	05/25/11 14:56	05/27/11 21:03	7440-43-9	
Calcium, Dissolved	**13600**	ug/L	20.0	1	05/25/11 14:56	05/27/11 21:03	7440-70-2	
Copper, Dissolved	**700**	ug/L	2.5	5	05/25/11 14:56	05/31/11 03:31	7440-50-8	
Iron, Dissolved	**1670**	ug/L	50.0	1	05/25/11 14:56	05/27/11 21:03	7439-89-6	
Lead, Dissolved	**3.3**	ug/L	0.10	1	05/25/11 14:56	05/27/11 21:03	7439-92-1	
Magnesium, Dissolved	**5290**	ug/L	5.0	1	05/25/11 14:56	05/27/11 21:03	7439-95-4	
Manganese, Dissolved	**118**	ug/L	0.50	1	05/25/11 14:56	05/27/11 21:03	7439-96-5	
Potassium, Dissolved	**2030**	ug/L	20.0	1	05/25/11 14:56	05/27/11 21:03	7440-09-7	
Sodium, Dissolved	**4130**	ug/L	250	5	05/25/11 14:56	05/31/11 03:31	7440-23-5	
Zinc, Dissolved	**1130**	ug/L	25.0	5	05/25/11 14:56	05/31/11 03:31	7440-66-6	
2310 Acidity	Analytical Method: SM 2310							
Acidity	**44.1**	mg/L	5.0	1		05/27/11 17:20		
2540D Total Suspended Solids	Analytical Method: SM 2540D							
Total Suspended Solids	**25.8**	mg/L	1.0	1		05/25/11 11:00		
300.0 IC Anions	Analytical Method: EPA 300.0							
Sulfate	**41.7**	mg/L	2.0	2		05/27/11 22:44	14808-79-8	
2320B Alkalinity	Analytical Method: SM 2320B							
Alkalinity, Total as CaCO3	**13.2**	mg/L	5.0	1		05/26/11 12:55		
2540C Total Dissolved Solids	Analytical Method: SM 2540C							
Total Dissolved Solids	**126**	mg/L	10.0	1		05/26/11 10:52		

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ANALYTICAL RESULTS

Project: 776-012-002 Black Pine Mine SW
Pace Project No.: 10158290

Sample: CPS-10B **Lab ID: 10158290011** Collected: 05/19/11 13:40 Received: 05/24/11 10:25 Matrix: Water

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
200.8 MET ICPMS, Dissolved	Analytical Method: EPA 200.8 Preparation Method: EPA 200.8							
Arsenic, Dissolved	**4.5**	ug/L	0.50	1	05/25/11 14:56	05/27/11 21:13	7440-38-2	
Cadmium, Dissolved	**132**	ug/L	0.080	1	05/25/11 14:56	05/27/11 21:13	7440-43-9	
Calcium, Dissolved	**58600**	ug/L	100	5	05/25/11 14:56	05/31/11 03:36	7440-70-2	
Copper, Dissolved	**8600**	ug/L	25.0	50	05/25/11 14:56	05/31/11 03:41	7440-50-8	
Iron, Dissolved	**4700**	ug/L	50.0	1	05/25/11 14:56	05/27/11 21:13	7439-89-6	
Lead, Dissolved	**9.2**	ug/L	0.10	1	05/25/11 14:56	05/27/11 21:13	7439-92-1	
Magnesium, Dissolved	**24300**	ug/L	25.0	5	05/25/11 14:56	05/31/11 03:36	7439-95-4	
Manganese, Dissolved	**2590**	ug/L	25.0	50	05/25/11 14:56	05/31/11 03:41	7439-96-5	
Potassium, Dissolved	**4630**	ug/L	20.0	1	05/25/11 14:56	05/27/11 21:13	7440-09-7	
Sodium, Dissolved	**6680**	ug/L	250	5	05/25/11 14:56	05/31/11 03:36	7440-23-5	
Zinc, Dissolved	**9720**	ug/L	250	50	05/25/11 14:56	05/31/11 03:41	7440-66-6	
2310 Acidity	Analytical Method: SM 2310							
Acidity	**40.2**	mg/L	5.0	1		05/27/11 17:20		
2540D Total Suspended Solids	Analytical Method: SM 2540D							
Total Suspended Solids	**644**	mg/L	2.7	1		05/25/11 11:00		
300.0 IC Anions	Analytical Method: EPA 300.0							
Sulfate	**266**	mg/L	5.0	5		05/31/11 17:17	14808-79-8	
2320B Alkalinity	Analytical Method: SM 2320B							
Alkalinity, Total as CaCO3	**<5.0**	mg/L	5.0	1		05/26/11 12:57		
2540C Total Dissolved Solids	Analytical Method: SM 2540C							
Total Dissolved Solids	**462**	mg/L	20.0	1		05/26/11 10:53		

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ANALYTICAL RESULTS

Project: 776-012-002 Black Pine Mine SW
Pace Project No.: 10158290

Sample: CPS-11 **Lab ID: 10158290012** Collected: 05/19/11 13:50 Received: 05/24/11 10:25 Matrix: Water

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
200.8 MET ICPMS, Dissolved	Analytical Method: EPA 200.8 Preparation Method: EPA 200.8							
Arsenic, Dissolved	**1.7**	ug/L	0.50	1	05/25/11 14:56	05/27/11 21:32	7440-38-2	
Cadmium, Dissolved	**13.4**	ug/L	0.080	1	05/25/11 14:56	05/27/11 21:32	7440-43-9	
Calcium, Dissolved	**13300**	ug/L	20.0	1	05/25/11 14:56	05/27/11 21:32	7440-70-2	
Copper, Dissolved	**638**	ug/L	2.5	5	05/25/11 14:56	05/27/11 21:37	7440-50-8	
Iron, Dissolved	**1340**	ug/L	50.0	1	05/25/11 14:56	05/27/11 21:32	7439-89-6	
Lead, Dissolved	**2.8**	ug/L	0.10	1	05/25/11 14:56	05/27/11 21:32	7439-92-1	
Magnesium, Dissolved	**5120**	ug/L	5.0	1	05/25/11 14:56	05/27/11 21:32	7439-95-4	
Manganese, Dissolved	**113**	ug/L	0.50	1	05/25/11 14:56	05/27/11 21:32	7439-96-5	
Potassium, Dissolved	**1930**	ug/L	20.0	1	05/25/11 14:56	05/27/11 21:32	7440-09-7	
Sodium, Dissolved	**3260**	ug/L	50.0	1	05/25/11 14:56	05/27/11 21:32	7440-23-5	
Zinc, Dissolved	**1010**	ug/L	25.0	5	05/25/11 14:56	05/27/11 21:37	7440-66-6	
2310 Acidity	Analytical Method: SM 2310							
Acidity	**34.4**	mg/L	5.0	1		05/27/11 17:20		
2540D Total Suspended Solids	Analytical Method: SM 2540D							
Total Suspended Solids	**21.0**	mg/L	1.0	1		05/25/11 11:00		
300.0 IC Anions	Analytical Method: EPA 300.0							
Sulfate	**28.5**	mg/L	2.0	2		05/27/11 23:41	14808-79-8	
2320B Alkalinity	Analytical Method: SM 2320B							
Alkalinity, Total as CaCO3	**12.9**	mg/L	5.0	1		05/26/11 13:00		
2540C Total Dissolved Solids	Analytical Method: SM 2540C							
Total Dissolved Solids	**144**	mg/L	10.0	1		05/26/11 10:54		

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ANALYTICAL RESULTS

Project: 776-012-002 Black Pine Mine SW
Pace Project No.: 10158290

Sample: ROAD CUT **Lab ID: 10158290013** Collected: 05/19/11 16:20 Received: 05/24/11 10:25 Matrix: Water

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
200.8 MET ICPMS, Dissolved	Analytical Method: EPA 200.8 Preparation Method: EPA 200.8							
Arsenic, Dissolved	**3.3**	ug/L	0.50	1	05/25/11 14:56	05/27/11 21:42	7440-38-2	
Cadmium, Dissolved	**<0.080**	ug/L	0.080	1	05/25/11 14:56	05/27/11 21:42	7440-43-9	
Calcium, Dissolved	**3190**	ug/L	20.0	1	05/25/11 14:56	05/27/11 21:42	7440-70-2	
Copper, Dissolved	**16.8**	ug/L	0.50	1	05/25/11 14:56	05/27/11 21:42	7440-50-8	
Iron, Dissolved	**1810**	ug/L	50.0	1	05/25/11 14:56	05/27/11 21:42	7439-89-6	
Lead, Dissolved	**5.3**	ug/L	0.10	1	05/25/11 14:56	05/27/11 21:42	7439-92-1	
Magnesium, Dissolved	**1560**	ug/L	5.0	1	05/25/11 14:56	05/27/11 21:42	7439-95-4	
Manganese, Dissolved	**16.0**	ug/L	0.50	1	05/25/11 14:56	05/27/11 21:42	7439-96-5	
Potassium, Dissolved	**1700**	ug/L	20.0	1	05/25/11 14:56	05/27/11 21:42	7440-09-7	
Sodium, Dissolved	**2270**	ug/L	50.0	1	05/25/11 14:56	05/27/11 21:42	7440-23-5	
Zinc, Dissolved	**9.2**	ug/L	5.0	1	05/25/11 14:56	05/27/11 21:42	7440-66-6	
2310 Acidity	Analytical Method: SM 2310							
Acidity	**11.1**	mg/L	5.0	1		05/27/11 17:20		
2540D Total Suspended Solids	Analytical Method: SM 2540D							
Total Suspended Solids	**7.3**	mg/L	1.0	1		05/25/11 11:00		
300.0 IC Anions	Analytical Method: EPA 300.0							
Sulfate	**6.7**	mg/L	5.0	5		05/28/11 00:10	14808-79-8	
2320B Alkalinity	Analytical Method: SM 2320B							
Alkalinity, Total as CaCO3	**13.1**	mg/L	5.0	1		05/26/11 13:03		
2540C Total Dissolved Solids	Analytical Method: SM 2540C							
Total Dissolved Solids	**58.0**	mg/L	10.0	1		05/26/11 10:54		

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QUALITY CONTROL DATA

Project: 776-012-002 Black Pine Mine SW
Pace Project No.: 10158290

QC Batch: MPRP/26262 Analysis Method: EPA 200.8
QC Batch Method: EPA 200.8 Analysis Description: 200.8 MET Dissolved
Associated Lab Samples: 10158290001, 10158290002, 10158290003, 10158290004, 10158290005, 10158290006, 10158290007, 10158290008, 10158290009, 10158290010

METHOD BLANK: 982391 Matrix: Water
Associated Lab Samples: 10158290001, 10158290002, 10158290003, 10158290004, 10158290005, 10158290006, 10158290007, 10158290008, 10158290009, 10158290010, 10158290011, 10158290012, 10158290013

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Arsenic, Dissolved	ug/L	<0.50	0.50	05/31/11 02:29	
Cadmium, Dissolved	ug/L	<0.080	0.080	05/31/11 02:29	
Calcium, Dissolved	ug/L	<20.0	20.0	05/31/11 02:29	
Copper, Dissolved	ug/L	<0.50	0.50	05/31/11 02:29	
Iron, Dissolved	ug/L	<50.0	50.0	05/31/11 02:29	
Lead, Dissolved	ug/L	<0.10	0.10	05/31/11 02:29	
Magnesium, Dissolved	ug/L	<5.0	5.0	05/31/11 02:29	
Manganese, Dissolved	ug/L	<0.50	0.50	05/31/11 02:29	
Potassium, Dissolved	ug/L	<20.0	20.0	05/31/11 02:29	
Sodium, Dissolved	ug/L	<50.0	50.0	05/31/11 02:29	
Zinc, Dissolved	ug/L	<5.0	5.0	05/31/11 02:29	

LABORATORY CONTROL SAMPLE: 982392

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Arsenic, Dissolved	ug/L	80	81.1	101	85-115	
Cadmium, Dissolved	ug/L	80	79.3	99	85-115	
Calcium, Dissolved	ug/L	1000	956	96	85-115	
Copper, Dissolved	ug/L	80	79.5	99	85-115	
Iron, Dissolved	ug/L	1000	1020	102	85-115	
Lead, Dissolved	ug/L	80	77.8	97	85-115	
Magnesium, Dissolved	ug/L	1000	1020	102	85-115	
Manganese, Dissolved	ug/L	80	81.7	102	85-115	
Potassium, Dissolved	ug/L	1000	1010	101	85-115	
Sodium, Dissolved	ug/L	1000	943	94	85-115	
Zinc, Dissolved	ug/L	80	80.0	100	85-115	

MATRIX SPIKE SAMPLE: 982837

Parameter	Units	10158057002 Result	Spike Conc.	MS Result	MS % Rec	% Rec Limits	Qualifiers
Arsenic, Dissolved	ug/L	<0.50	80	81.6	102	70-130	
Cadmium, Dissolved	ug/L	0.00025 mg/L	80	81.8	102	70-130	
Calcium, Dissolved	ug/L	30200	1000	30800	58	70-130	M1
Copper, Dissolved	ug/L	0.0022 mg/L	80	81.2	99	70-130	
Iron, Dissolved	ug/L	0.12 mg/L	1000	1120	100	70-130	
Lead, Dissolved	ug/L	0.0019 mg/L	80	79.2	97	70-130	
Magnesium, Dissolved	ug/L	10300	1000	11600	130	70-130	
Manganese, Dissolved	ug/L	0.0021 mg/L	80	82.3	100	70-130	

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QUALITY CONTROL DATA

Project: 776-012-002 Black Pine Mine SW
Pace Project No.: 10158290

MATRIX SPIKE SAMPLE: 982837

Parameter	Units	10158057002 Result	Spike Conc.	MS Result	MS % Rec	% Rec Limits	Qualifiers
Potassium, Dissolved	ug/L	5670	1000	6760	108	70-130	
Sodium, Dissolved	ug/L	7700	1000	8680	97	70-130	
Zinc, Dissolved	ug/L	<0.0050 mg/L	80	83.4	99	70-130	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 982838 982839

Parameter	Units	10158290007 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Arsenic, Dissolved	ug/L	2.3	80	80	88.8	97.4	108	119	70-130	9	20	
Cadmium, Dissolved	ug/L	2.3	80	80	85.4	92.6	104	113	70-130	8	20	
Calcium, Dissolved	ug/L	6960	1000	1000	8590	9350	163	239	70-130	8	20	M1
Copper, Dissolved	ug/L	126	80	80	221	242	120	146	70-130	9	20	M1
Iron, Dissolved	ug/L	777	1000	1000	3190	3450	242	268	70-130	8	20	M1
Lead, Dissolved	ug/L	3.1	80	80	88.2	96.5	106	117	70-130	9	20	
Magnesium, Dissolved	ug/L	2320	1000	1000	3760	4080	143	176	70-130	8	20	M1
Manganese, Dissolved	ug/L	19.3	80	80	109	119	113	124	70-130	8	20	
Potassium, Dissolved	ug/L	2030	1000	1000	3690	3950	167	192	70-130	7	20	M1
Sodium, Dissolved	ug/L	3280	1000	1000	4440	4890	116	161	70-130	10	20	M1
Zinc, Dissolved	ug/L	199	80	80	308	343	137	180	70-130	11	20	M1

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Billings, MT 591014549
(406)254-7226

QUALITY CONTROL DATA

Project: 776-012-002 Black Pine Mine SW
Pace Project No.: 10158290

QC Batch: MT/6058 Analysis Method: SM 2310
QC Batch Method: SM 2310 Analysis Description: 2310 Acidity
Associated Lab Samples: 10158290001, 10158290002, 10158290003, 10158290004, 10158290005, 10158290006, 10158290007, 10158290008, 10158290009, 10158290010, 10158290011, 10158290012, 10158290013

METHOD BLANK: 983749 Matrix: Water
Associated Lab Samples: 10158290001, 10158290002, 10158290003, 10158290004, 10158290005, 10158290006, 10158290007, 10158290008, 10158290009, 10158290010, 10158290011, 10158290012, 10158290013

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Acidity	mg/L	<5.0	5.0	05/27/11 17:20	

SAMPLE DUPLICATE: 983750

Parameter	Units	10158057001 Result	Dup Result	RPD	Max RPD	Qualifiers
Acidity	mg/L	<5.0	<5.0		20	

SAMPLE DUPLICATE: 983751

Parameter	Units	10158290004 Result	Dup Result	RPD	Max RPD	Qualifiers
Acidity	mg/L	37.3	46.0	21	20	R1

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QUALITY CONTROL DATA

Project: 776-012-002 Black Pine Mine SW
Pace Project No.: 10158290

QC Batch: MT/6046 Analysis Method: SM 2540D
QC Batch Method: SM 2540D Analysis Description: 2540D Total Suspended Solids
Associated Lab Samples: 10158290001, 10158290002, 10158290003, 10158290004, 10158290005, 10158290006, 10158290007, 10158290008, 10158290009, 10158290010, 10158290011, 10158290012, 10158290013

METHOD BLANK: 982517 Matrix: Water
Associated Lab Samples: 10158290001, 10158290002, 10158290003, 10158290004, 10158290005, 10158290006, 10158290007, 10158290008, 10158290009, 10158290010, 10158290011, 10158290012, 10158290013

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Total Suspended Solids	mg/L	<1.0	1.0	05/25/11 11:00	

LABORATORY CONTROL SAMPLE: 982518

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Total Suspended Solids	mg/L	25	28.2	113	71-129	

SAMPLE DUPLICATE: 982519

Parameter	Units	10158290004 Result	Dup Result	RPD	Max RPD	Qualifiers
Total Suspended Solids	mg/L	2670	3580	29	20	D6

SAMPLE DUPLICATE: 982520

Parameter	Units	10158114001 Result	Dup Result	RPD	Max RPD	Qualifiers
Total Suspended Solids	mg/L	268	243	10	20	

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QUALITY CONTROL DATA

Project: 776-012-002 Black Pine Mine SW
Pace Project No.: 10158290

QC Batch: MT/6064 Analysis Method: EPA 300.0
QC Batch Method: EPA 300.0 Analysis Description: 300.0 IC Anions
Associated Lab Samples: 10158290001, 10158290002, 10158290003, 10158290004, 10158290005, 10158290006, 10158290007, 10158290008, 10158290009, 10158290010, 10158290011, 10158290012, 10158290013

METHOD BLANK: 984127 Matrix: Water
Associated Lab Samples: 10158290001, 10158290002, 10158290003, 10158290004, 10158290005, 10158290006, 10158290007, 10158290008, 10158290009, 10158290010, 10158290011, 10158290012, 10158290013

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Sulfate	mg/L	<1.0	1.0	05/27/11 14:04	

LABORATORY CONTROL SAMPLE: 984128

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Sulfate	mg/L	20	19.3	97	90-110	

MATRIX SPIKE SAMPLE: 984129

Parameter	Units	10158290001 Result	Spike Conc.	MS Result	MS % Rec	% Rec Limits	Qualifiers
Sulfate	mg/L	294	500	798	101	80-120	

MATRIX SPIKE SAMPLE: 984131

Parameter	Units	10158316001 Result	Spike Conc.	MS Result	MS % Rec	% Rec Limits	Qualifiers
Sulfate	mg/L	742	1000	1730	99	80-120	

SAMPLE DUPLICATE: 984130

Parameter	Units	10158290005 Result	Dup Result	RPD	Max RPD	Qualifiers
Sulfate	mg/L	19.6	18.5	6	20	

SAMPLE DUPLICATE: 984132

Parameter	Units	10158316003 Result	Dup Result	RPD	Max RPD	Qualifiers
Sulfate	mg/L	255	224	13	20	

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QUALITY CONTROL DATA

Project: 776-012-002 Black Pine Mine SW
Pace Project No.: 10158290

QC Batch: WET/22431 Analysis Method: SM 2320B
QC Batch Method: SM 2320B Analysis Description: 2320B Alkalinity
Associated Lab Samples: 10158290001, 10158290002, 10158290003, 10158290004, 10158290005, 10158290006, 10158290007, 10158290008, 10158290009, 10158290010, 10158290011, 10158290012, 10158290013

METHOD BLANK: 983335 Matrix: Water
Associated Lab Samples: 10158290001, 10158290002, 10158290003, 10158290004, 10158290005, 10158290006, 10158290007, 10158290008, 10158290009, 10158290010, 10158290011, 10158290012, 10158290013

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Alkalinity, Total as CaCO3	mg/L	<5.0	5.0	05/26/11 11:15	

LABORATORY CONTROL SAMPLE & LCSD: 983336 983337

Parameter	Units	Spike Conc.	LCS Result	LCSD Result	LCS % Rec	LCSD % Rec	% Rec Limits	RPD	Max RPD	Qualifiers
Alkalinity, Total as CaCO3	mg/L	40	39.8	39.8	100	100	90-110	.08	30	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 983338 983339

Parameter	Units	10157782001 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Alkalinity, Total as CaCO3	mg/L	266	40	40	306	304	101	96	80-120	.7	30	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 983340 983341

Parameter	Units	10158290008 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Alkalinity, Total as CaCO3	mg/L	10.5	40	40	48.3	49.3	94	97	80-120	2	30	

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QUALITY CONTROL DATA

Project: 776-012-002 Black Pine Mine SW
Pace Project No.: 10158290

QC Batch: WET/22417 Analysis Method: SM 2540C
QC Batch Method: SM 2540C Analysis Description: 2540C Total Dissolved Solids
Associated Lab Samples: 10158290001, 10158290002, 10158290003, 10158290004, 10158290005, 10158290006, 10158290007, 10158290008, 10158290009

METHOD BLANK: 982593 Matrix: Water
Associated Lab Samples: 10158290001, 10158290002, 10158290003, 10158290004, 10158290005, 10158290006, 10158290007, 10158290008, 10158290009

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Total Dissolved Solids	mg/L	<10.0	10.0	05/25/11 14:00	

LABORATORY CONTROL SAMPLE: 982594

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Total Dissolved Solids	mg/L	1000	1000	100	80-120	

SAMPLE DUPLICATE: 982595

Parameter	Units	10158240001 Result	Dup Result	RPD	Max RPD	Qualifiers
Total Dissolved Solids	mg/L	723	732	1	20	

SAMPLE DUPLICATE: 982596

Parameter	Units	10158290001 Result	Dup Result	RPD	Max RPD	Qualifiers
Total Dissolved Solids	mg/L	584	514	13	20	

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QUALITY CONTROL DATA

Project: 776-012-002 Black Pine Mine SW
Pace Project No.: 10158290

QC Batch: WET/22430 Analysis Method: SM 2540C
QC Batch Method: SM 2540C Analysis Description: 2540C Total Dissolved Solids
Associated Lab Samples: 10158290010, 10158290011, 10158290012, 10158290013

METHOD BLANK: 983331 Matrix: Water
Associated Lab Samples: 10158290010, 10158290011, 10158290012, 10158290013

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Total Dissolved Solids	mg/L	<10.0	10.0	05/27/11 11:57	

LABORATORY CONTROL SAMPLE: 983332

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Total Dissolved Solids	mg/L	1000	992	99	80-120	

SAMPLE DUPLICATE: 983333

Parameter	Units	10158290013 Result	Dup Result	RPD	Max RPD	Qualifiers
Total Dissolved Solids	mg/L	58.0	62.0	7	20	

SAMPLE DUPLICATE: 983334

Parameter	Units	10158146003 Result	Dup Result	RPD	Max RPD	Qualifiers
Total Dissolved Solids	mg/L	150	154	3	20	

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QUALIFIERS

Project: 776-012-002 Black Pine Mine SW
Pace Project No.: 10158290

DEFINITIONS

DF - Dilution Factor, if reported, represents the factor applied to the reported data due to changes in sample preparation, dilution of the sample aliquot, or moisture content.

ND - Not Detected at or above adjusted reporting limit.

J - Estimated concentration above the adjusted method detection limit and below the adjusted reporting limit.

MDL - Adjusted Method Detection Limit.

S - Surrogate

1,2-Diphenylhydrazine (8270 listed analyte) decomposes to Azobenzene.

Consistent with EPA guidelines, unrounded data are displayed and have been used to calculate % recovery and RPD values.

LCS(D) - Laboratory Control Sample (Duplicate)

MS(D) - Matrix Spike (Duplicate)

DUP - Sample Duplicate

RPD - Relative Percent Difference

NC - Not Calculable.

SG - Silica Gel - Clean-Up

U - Indicates the compound was analyzed for, but not detected.

N-Nitrosodiphenylamine decomposes and cannot be separated from Diphenylamine using Method 8270. The result reported for each analyte is a combined concentration.

LABORATORIES

PASI-M	Pace Analytical Services - Minneapolis
PASI-MT	Pace Analytical Services - Montana

ANALYTE QUALIFIERS

D6	The relative percent difference (RPD) between the sample and sample duplicate exceeded laboratory control limits.
M1	Matrix spike recovery exceeded QC limits. Batch accepted based on laboratory control sample (LCS) recovery.
R1	RPD value was outside control limits.

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QUALITY CONTROL DATA CROSS REFERENCE TABLE

Project: 776-012-002 Black Pine Mine SW
Pace Project No.: 10158290

Lab ID	Sample ID	QC Batch Method	QC Batch	Analytical Method	Analytical Batch
10158290001	**CPS-1**	EPA 200.8	MPRP/26262	EPA 200.8	ICPM/10726
10158290002	**CPS-10A**	EPA 200.8	MPRP/26262	EPA 200.8	ICPM/10726
10158290003	**CPS-2**	EPA 200.8	MPRP/26262	EPA 200.8	ICPM/10726
10158290004	**CPS-7A**	EPA 200.8	MPRP/26262	EPA 200.8	ICPM/10726
10158290005	**CPS-8**	EPA 200.8	MPRP/26262	EPA 200.8	ICPM/10726
10158290006	**CPSW-1**	EPA 200.8	MPRP/26262	EPA 200.8	ICPM/10726
10158290007	**CPSW-2**	EPA 200.8	MPRP/26262	EPA 200.8	ICPM/10726
10158290008	**NORTH RUNOFF**	EPA 200.8	MPRP/26262	EPA 200.8	ICPM/10726
10158290009	**TSP-10**	EPA 200.8	MPRP/26262	EPA 200.8	ICPM/10726
10158290010	**BD-1**	EPA 200.8	MPRP/26262	EPA 200.8	ICPM/10726
10158290011	**CPS-10B**	EPA 200.8	MPRP/26262	EPA 200.8	ICPM/10726
10158290012	**CPS-11**	EPA 200.8	MPRP/26262	EPA 200.8	ICPM/10726
10158290013	**ROAD CUT**	EPA 200.8	MPRP/26262	EPA 200.8	ICPM/10726
10158290001	**CPS-1**	SM 2310	MT/6058		
10158290002	**CPS-10A**	SM 2310	MT/6058		
10158290003	**CPS-2**	SM 2310	MT/6058		
10158290004	**CPS-7A**	SM 2310	MT/6058		
10158290005	**CPS-8**	SM 2310	MT/6058		
10158290006	**CPSW-1**	SM 2310	MT/6058		
10158290007	**CPSW-2**	SM 2310	MT/6058		
10158290008	**NORTH RUNOFF**	SM 2310	MT/6058		
10158290009	**TSP-10**	SM 2310	MT/6058		
10158290010	**BD-1**	SM 2310	MT/6058		
10158290011	**CPS-10B**	SM 2310	MT/6058		
10158290012	**CPS-11**	SM 2310	MT/6058		
10158290013	**ROAD CUT**	SM 2310	MT/6058		
10158290001	**CPS-1**	SM 2540D	MT/6046		
10158290002	**CPS-10A**	SM 2540D	MT/6046		
10158290003	**CPS-2**	SM 2540D	MT/6046		
10158290004	**CPS-7A**	SM 2540D	MT/6046		
10158290005	**CPS-8**	SM 2540D	MT/6046		
10158290006	**CPSW-1**	SM 2540D	MT/6046		
10158290007	**CPSW-2**	SM 2540D	MT/6046		
10158290008	**NORTH RUNOFF**	SM 2540D	MT/6046		
10158290009	**TSP-10**	SM 2540D	MT/6046		
10158290010	**BD-1**	SM 2540D	MT/6046		
10158290011	**CPS-10B**	SM 2540D	MT/6046		
10158290012	**CPS-11**	SM 2540D	MT/6046		
10158290013	**ROAD CUT**	SM 2540D	MT/6046		
10158290001	**CPS-1**	EPA 300.0	MT/6064		
10158290002	**CPS-10A**	EPA 300.0	MT/6064		
10158290003	**CPS-2**	EPA 300.0	MT/6064		
10158290004	**CPS-7A**	EPA 300.0	MT/6064		
10158290005	**CPS-8**	EPA 300.0	MT/6064		
10158290006	**CPSW-1**	EPA 300.0	MT/6064		
10158290007	**CPSW-2**	EPA 300.0	MT/6064		
10158290008	**NORTH RUNOFF**	EPA 300.0	MT/6064		

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QUALITY CONTROL DATA CROSS REFERENCE TABLE

Project: 776-012-002 Black Pine Mine SW
Pace Project No.: 10158290

Lab ID	Sample ID	QC Batch Method	QC Batch	Analytical Method	Analytical Batch
10158290009	**TSP-10**	EPA 300.0	MT/6064		
10158290010	**BD-1**	EPA 300.0	MT/6064		
10158290011	**CPS-10B**	EPA 300.0	MT/6064		
10158290012	**CPS-11**	EPA 300.0	MT/6064		
10158290013	**ROAD CUT**	EPA 300.0	MT/6064		
10158290001	**CPS-1**	SM 2320B	WET/22431		
10158290002	**CPS-10A**	SM 2320B	WET/22431		
10158290003	**CPS-2**	SM 2320B	WET/22431		
10158290004	**CPS-7A**	SM 2320B	WET/22431		
10158290005	**CPS-8**	SM 2320B	WET/22431		
10158290006	**CPSW-1**	SM 2320B	WET/22431		
10158290007	**CPSW-2**	SM 2320B	WET/22431		
10158290008	**NORTH RUNOFF**	SM 2320B	WET/22431		
10158290009	**TSP-10**	SM 2320B	WET/22431		
10158290010	**BD-1**	SM 2320B	WET/22431		
10158290011	**CPS-10B**	SM 2320B	WET/22431		
10158290012	**CPS-11**	SM 2320B	WET/22431		
10158290013	**ROAD CUT**	SM 2320B	WET/22431		
10158290001	**CPS-1**	SM 2540C	WET/22417		
10158290002	**CPS-10A**	SM 2540C	WET/22417		
10158290003	**CPS-2**	SM 2540C	WET/22417		
10158290004	**CPS-7A**	SM 2540C	WET/22417		
10158290005	**CPS-8**	SM 2540C	WET/22417		
10158290006	**CPSW-1**	SM 2540C	WET/22417		
10158290007	**CPSW-2**	SM 2540C	WET/22417		
10158290008	**NORTH RUNOFF**	SM 2540C	WET/22417		
10158290009	**TSP-10**	SM 2540C	WET/22417		
10158290010	**BD-1**	SM 2540C	WET/22430		
10158290011	**CPS-10B**	SM 2540C	WET/22430		
10158290012	**CPS-11**	SM 2540C	WET/22430		
10158290013	**ROAD CUT**	SM 2540C	WET/22430		

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CHAIN-OF-CUSTODY / Analytical Request Document

The Chain-of-Custody is a LEGAL DOCUMENT. All relevant fields must be completed accurately.

Page: 1 of 2

Section A Required Client Information:

Company:	Herrera Environmental
Address:	101 East Broadway
	Suite 610
Email To:	
Phone: 406-721-6869	Fax:
Requested Due Date/TAT:	STD

Section B Required Project Information:

Report To:	Kevin Hauck
Copy To:	
Purchase Order No.:	
Project Name:	Surface Water
Project Number:	

Section C Invoice Information:

Attention:	
Company Name:	
Address:	
Pace Quote Reference:	
Pace Project Manager:	Denise Jenson
Pace Profile #:	

REGULATORY AGENCY

☐ NPDES ☐ GROUND WATER ☐ DRINKING WATER
☐ UST ☐ RCRA ☐ OTHER

Site Location STATE: Montana

Section D Required Client Information

SAMPLE ID (A-Z, 0-9 / ,-) Sample IDs MUST BE UNIQUE

Valid Matrix Codes

MATRIX	CODE
DRINKING WATER	DW
WATER	WT
WASTE WATER	WW
PRODUCT	P
SOIL/SOLID	SL
OIL	OL
WIPE	WP
AIR	AR
OTHER	OT
TISSUE	TS

ITEM #	SAMPLE ID	MATRIX CODE (see valid codes to left)	SAMPLE TYPE (G=GRAB C=COMP)	COLLECTED: COMPOSITE START DATE	COLLECTED: COMPOSITE START TIME	COLLECTED: COMPOSITE END/GRAB DATE	COLLECTED: COMPOSITE END/GRAB TIME	SAMPLE TEMP AT COLLECTION	# OF CONTAINERS	Preservatives: Unpreserved	H_2SO_4	HNO_3	HCl	NaOH	$Na_2S_2O_3$	Methanol	Other	Y/N	Analysis Test ↓: Dissolved metals*	TSS	TDS, alkalinity	Sulfate, Acidity	Residual Chlorine (Y/N)	Pace Project No./ Lab I.D.
1	CPS-1	WT		5/10/11	1310				4	3		1						x	x	x	x		10158790 001
2	CPS-10A	WT			1100				4	3		1						x	x	x	x		002
3	CPS-2	WT			1240				4	3		1						x	x	x	x		003
4	CPS-7A	WT			1515				4	3		1						x	x	x	x		004
5	CPS-8	WT			1455				4	3		1						x	x	x	x		005
6	CPSW-1	WT			1220				4	3		1						x	x	x	x		006
7	CPSW-2	WT			1155				4	3		1						x	x	x	x		007
8	North Runoff	WT			1320				4	3		1						x	x	x	x		008
9	TSP-10 ~~North Removal Area Drainage~~	WT			1600				4	3		1						x	x	x	x		009
10	SD-1 ~~South Removal Area Drainage~~	WT			—				4	3		1						x	x	x	x		010
11	CPS-10B	WT			1340				4	3		1						x	x	x	x		011
12	CPS-11				1350				4	3		1						x	x	x	x		012

ADDITIONAL COMMENTS	RELINQUISHED BY / AFFILIATION	DATE	TIME	ACCEPTED BY / AFFILIATION	DATE	TIME	SAMPLE CONDITIONS: Temp in °C	Received on Ice (Y/N)	Custody Sealed Cooler (Y/N)	Samples Intact (Y/N)
Dissolved Metals: As, Cd, Cu, Fe, Pb, Mn, Ca, Mg, Na, K	[signature] / THC	5/23/11	1300							
	Fedex	5/24/11	1025	Norma Charlefoux / GLS	5/24/11	1025	4.3°	Y	Y	Y
							4.9°	Y	Y	Y

SAMPLER NAME AND SIGNATURE

PRINT Name of SAMPLER: Lukey Dayne Li

SIGNATURE of SAMPLER: [signature] DATE Signed (MM/DD/YY): 5/10/11

*Important Note: By signing this form you are accepting Pace's NET 30 day payment terms and agreeing to late charges of 1.5% per month for any invoices not paid within 30 days.

F-ALL-Q-020rev.08, 12-Oct-2007

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CHAIN-OF-CUSTODY / Analytical Request Document

The Chain-of-Custody is a LEGAL DOCUMENT. All relevant fields must be completed accurately.

Section A Required Client Information:

Company:	Herrera Environmental
Address:	101 East Broadway, Ste 610
	Missoula, MT 59802
Email To:	
Phone: 406-721-6869	Fax:
Requested Due Date/TAT:	

Section B Required Project Information:

Report To:	Kevin Houck
Copy To:	
Purchase Order No.:	
Project Name:	Surface Water
Project Number:	776-012-002

Section C Invoice Information:

Attention:	
Company Name:	
Address:	
Pace Quote Reference:	
Pace Project Manager:	
Pace Profile #:	

REGULATORY AGENCY

☐ NPDES ☐ GROUND WATER ☐ DRINKING WATER
☐ UST ☐ RCRA ☐ OTHER _____

Site Location STATE: MT

Section D Required Client Information

SAMPLE ID
(A-Z, 0-9 / ,-)
Sample IDs MUST BE UNIQUE

Valid Matrix Codes

MATRIX	CODE
DRINKING WATER	DW
WATER	WT
WASTE WATER	WW
PRODUCT	P
SOIL/SOLID	SL
OIL	OL
WIPE	WP
AIR	AR
OTHER	OT
TISSUE	TS

Requested Analysis Filtered (Y/N)

ITEM #	Sample ID	MATRIX CODE (see valid codes to left)	SAMPLE TYPE (G=GRAB C=COMP)	COLLECTED COMPOSITE START DATE	COLLECTED COMPOSITE START TIME	COLLECTED COMPOSITE END/GRAB DATE	COLLECTED COMPOSITE END/GRAB TIME	SAMPLE TEMP AT COLLECTION	# OF CONTAINERS	Preservatives: Unpreserved	H_2SO_4	HNO_3	HCl	NaOH	$Na_2S_2O_3$	Methanol	Other	Y/N	Analysis Test: Dissolved metals	TSS	TDS, alkalinity	Sulfate, Acidity	Residual Chlorine (Y/N)	Pace Project No./ Lab I.D.
1	Road cut	WT		5/19/11	1620				4	3			1					x	x	x	x			10158290 013
2																								
3																								
4																								
5																								
6																								
7																								
8																								
9																								
10																								
11																								
12																								

ADDITIONAL COMMENTS	RELINQUISHED BY / AFFILIATION	DATE	TIME	ACCEPTED BY / AFFILIATION	DATE	TIME
Dissolved metals: As, Cd, Cu, Fe, Pb, Mn, Ca, Mg, Na, K	[signature] / THC	5/23/11	1300			
	Fedex	5/24/11	1025	Norma C Trenkle/Pace for Jeff Graves	5/24/11	1025

SAMPLE CONDITIONS

Temp in °C	Received on Ice (Y/N)	Custody Sealed Cooler (Y/N)	Samples Intact (Y/N)
4.3	Y	Y	Y
4.9	Y	Y	Y

SAMPLER NAME AND SIGNATURE

PRINT Name of SAMPLER: Luke Darnell

SIGNATURE of SAMPLER: [signature]

DATE Signed (MM/DD/YY): 5/19/11

*Important Note: By signing this form you are accepting Pace's NET 30 day payment terms and agreeing to late charges of 1.5% per month for any invoices not paid within 30 days.

TASK ORDER NO. 9

This Task Order is issued pursuant to DEQ Contract No. 407032 between Herrera Environmental Consultants, Inc. (Contractor) and the Montana Department of Environmental Quality (DEQ). The purpose of Task Order No. 9 is to conduct water monitoring of groundwater wells and water sampling of springs/seeps and surface water runoff at the Black Pine Mine site in the Smart Creek drainage.

PROJECT BACKGROUND

The Black Pine Mine is located approximately ten miles northwest of Philipsburg, Montana in Sections 7, 8, 9, 16, 17, 18, 20, and 21 in Township 8 North, Range 14 West, Granite County. The project area lies between Smart Creek and the confluence of the South Fork Lower Willow Creek and Mill Creek. The site consists of historic hard rock mine waste sources as well as more recent permitted mining operations.

TASK DESCRIPTION

Task 1: Surface Water/Groundwater Sampling Plan

- Contractor shall provide a sampling plan describing the surface water and groundwater sampling procedures and sample locations. The surface water and groundwater sampling plan shall be incorporated into the Black Pine Mine Reclamation Work Plan, to be developed under a separate task order.

Task 2: Data Collection – Surface Water

- Contractor shall collect surface water samples for laboratory analysis from the following locations:
  - CPS-1
  - CPS-2
  - CPS-7A
  - CPS-8
  - CPSW-1
  - CPSW-2
  - CPS-10
  - North Removal Area Drainage
  - South Removal Area Drainage
  - North Runoff (mid-slope runoff from Combination Soils)
  - Any seeps that are identified in the field that are not listed above

- Surface water samples shall be analyzed by a laboratory contracted directly by DEQ. The lab shall invoice DEQ directly. Samples are to be analyzed for the following parameters:

Parameter		
Field Parameters	***Laboratory Parameters***	***Metals (Total Recoverable)***
pH	Calcium (Ca)	Arsenic (As)
Specific Conductance	Magnesium (Mg)	Cadmium (Cd)
Dissolved Oxygen	Sodium (Na)	Copper (Cu)
Water Temperature	Potassium (K)	Iron (Fe)
Flow	Sulfate (SO4)	Lead (Pb)
	Total Alkalinity as CaCO3	Manganese (Mn)
	Total Acidity as CaCO3	Zinc (Zn)

	Total Dissolved Solids	
	Total Suspended Solids	

- The sampling event shall be timed to catch the maximum number of seeps associated with spring runoff.
- Contractor will document all seeps and sample locations by photographs and GPS or survey data.

Task 3: Data Collection – Groundwater

- Contractor shall collect ground water samples for laboratory analysis from the following locations:
  - CMMW-1
  - CMMW-2
  - CMMW-3
  - CMMW-4
  - CMMW-5
  - CMMW-6
  - CMMW-7
  - CMMW-8
  - CMMW-9

- Groundwater samples shall be analyzed by a laboratory contracted directly by DEQ. The lab shall invoice DEQ directly. Samples are to be analyzed for the following parameters:

Parameter		
Field Parameters	***Laboratory Parameters***	***Metals (Dissolved)***
pH	Calcium (Ca)	Arsenic (As)
Specific Conductance	Magnesium (Mg)	Cadmium (Cd)
Dissolved Oxygen	Sodium (Na)	Copper (Cu)
Water Temperature	Potassium (K)	Iron (Fe)
	Sulfate (SO4)	Lead (Pb)
	Total Alkalinity as CaCO3	Manganese (Mn)
	Total Dissolved Solids	Zinc (Zn)
	Total Suspended Solids	

- Contractor shall notify the DEQ three (3) days in prior to conducting field sampling activities.

Task 4: Data Collection – Flow Meter

- Contractor shall identify a flow meter for the pump on the seepage collection/pumpback system at the Combination Mine. Contractor shall provide manufacturers cut sheet and material supplier to DEQ for approval.
- Contractor shall be responsible for procuring and installing the approved device.

DELIVERABLES

The following deliverables will be completed and delivered by the Contractor:

Sample Condition Upon Receipt

Pace Analytical

Client Name: HERRERA ENV. Project # 10158290

Courier: [X] Fed Ex [ ] UPS [ ] USPS [ ] Client [ ] Commercial [ ] Pace Other _____

Tracking #: 8730 0635 9602 9590

Custody Seal on Cooler/Box Present: [X] yes [ ] no Seals intact: [X] yes [ ] no

Packing Material: [X] Bubble Wrap [ ] Bubble Bags [ ] None [ ] Other _____ Temp Blank: Yes X No _____

Thermometer Used 1883045 or 135 Type of Ice: (Wet) Blue None [X] Samples on ice, cooling process has begun

Cooler Temperature 4.3°, 4.9° Biological Tissue is Frozen: Yes No

Date and Initials of person examining contents: NCT 5/24/11

Temp should be above freezing to 6°C

Comments:

Chain of Custody Present:	[X] Yes [ ] No [ ] N/A	1.
Chain of Custody Filled Out:	[X] Yes [ ] No [ ] N/A	2.
Chain of Custody Relinquished:	[X] Yes [ ] No [ ] N/A	3.
Sampler Name & Signature on COC:	[X] Yes [ ] No [ ] N/A	4.
Samples Arrived within Hold Time:	[X] Yes [ ] No [ ] N/A	5. SHORT
Short Hold Time Analysis (<72hr):	[X] Yes [ ] No [ ] N/A	6. 48 hrs hold left on TDS/TSS ~~HOLD~~ HOH ~~HOHS~~
Rush Turn Around Time Requested:	[ ] Yes [X] No [ ] N/A	7. STD
Sufficient Volume:	[X] Yes [ ] No [ ] N/A	8.
Correct Containers Used:	[X] Yes [ ] No [ ] N/A	9.
-Pace Containers Used:	[X] Yes [ ] No [ ] N/A	
Containers Intact:	[X] Yes [ ] No [ ] N/A	10.
Filtered volume received for Dissolved tests	[X] Yes [ ] No [ ] N/A	11.
Sample Labels match COC:	[X] Yes [ ] No [ ] N/A	12.
-Includes date/time/ID/Analysis Matrix: H_2O		
All containers needing acid/base preservation have been checked. Noncompliance are noted in 13.	[X] Yes [ ] No [ ] N/A	13. [X] HNO3 [ ] H2SO4 [ ] NaOH [ ] HCl
All containers needing preservation are found to be in compliance with EPA recommendation.	[X] Yes [ ] No [ ] N/A	Samp # - 001 through -013, HNO_3 (1/1)
Exceptions: VOA,Coliform, TOC, Oil and Grease, WI-DRO (water)	[ ] Yes [X] No	Initial when completed NCT / Lot # of added preservative
Samples checked for dechlorination:	[ ] Yes [ ] No [X] N/A	14.
Headspace in VOA Vials (>6mm):	[ ] Yes [ ] No [X] N/A	15.
Trip Blank Present:	[ ] Yes [ ] No [X] N/A	16.
Trip Blank Custody Seals Present	[ ] Yes [ ] No [X] N/A	
Pace Trip Blank Lot # (if purchased): _____		

Client Notification/ Resolution: Field Data Required? Y / N

Person Contacted: _____ Date/Time: _____

Comments/ Resolution: _____

Project Manager Review: _____ **Date:** 5-24-11

Note: Whenever there is a discrepancy affecting North Carolina compliance samples, a copy of this form will be sent to the North Carolina DEHNR Certification Office (i.e out of hold, incorrect preservative, out of temp, incorrect containers)

Pace Analytical Services, Inc.
602 S 25th Street
Billings, MT 591014549
(406)254-7226

June 30, 2011

Kevin Houck
Herrera Environmental Consultants
101 East Broadway, Suite 610
Missoula, MT 59802

RE: Project: Black Pine Mine
Pace Project No.: 10160655

Dear Kevin Houck:
Enclosed are the analytical results for sample(s) received by the laboratory on June 17, 2011. The results relate only to the samples included in this report.

If you have any questions concerning this report, please feel free to contact me.

Sincerely,

Denise Jensen

denise.jensen@pacelabs.com
Project Manager

Enclosures

cc: Devin Clary, Montana Dept. of Environmental Quality
Mark Donner, Trihydro

REPORT OF LABORATORY ANALYSIS

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CERTIFICATIONS

Project: Black Pine Mine
Pace Project No.: 10160655

Minnesota Certification IDs

1700 Elm Street SE Suite 200, Minneapolis, MN 55414
A2LA Certification #: 2926.01
Alaska Certification #: UST-078
Alaska Certification #MN00064
Arizona Certification #: AZ-0014
Arkansas Certification #: 88-0680
California Certification #: 01155CA
EPA Region 8 Certification #: Pace
Florida/NELAP Certification #: E87605
Georgia Certification #: 959
Idaho Certification #: MN00064
Illinois Certification #: 200011
Iowa Certification #: 368
Kansas Certification #: E-10167
Louisiana Certification #: 03086
Louisiana Certification #: LA080009
Maine Certification #: 2007029
Maryland Certification #: 322
Michigan DEQ Certification #: 9909
Minnesota Certification #: 027-053-137
Mississippi Certification #: Pace
Montana Certification #: MT CERT0092
Nebraska Certification #: Pace
Nevada Certification #: MN_00064
New Jersey Certification #: MN-002
New Mexico Certification #: Pace
New York Certification #: 11647
North Carolina Certification #: 530
North Dakota Certification #: R-036
North Dakota Certification #: R-036A
Ohio VAP Certification #: CL101
Oklahoma Certification #: D9921
Oklahoma Certification #: 9507
Oregon Certification #: MN200001
Pennsylvania Certification #: 68-00563
Puerto Rico Certification
Tennessee Certification #: 02818
Texas Certification #: T104704192
Washington Certification #: C754
Wisconsin Certification #: 999407970

Montana Certification IDs

602 South 25th Street, Billings, MT 59101
EPA Region 8 Certification #: 8TMS-Q
Idaho Certification #: MT00012
Montana Certification #: MT CERT0040
NVLAP Certification #: 101292-0
Minnesota Dept of Health Certification #: 030-999-442

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SAMPLE SUMMARY

Project: Black Pine Mine
Pace Project No.: 10160655

Lab ID	Sample ID	Matrix	Date Collected	Date Received
10160655001	**CML-SW-07**	Water	06/14/11 10:05	06/17/11 08:50
10160655002	**CML-SW-03**	Water	06/15/11 08:20	06/17/11 08:50
10160655003	**CML-SW-08**	Water	06/15/11 15:20	06/17/11 08:50
10160655004	**CML-SW-10**	Water	06/15/11 14:51	06/17/11 08:50
10160655005	**CML-SW-16**	Water	06/15/11 14:09	06/17/11 08:50
10160655006	**CML-SW-15**	Water	06/15/11 13:35	06/17/11 08:50
10160655007	**CML-Q1-T1**	Water	06/15/11 13:39	06/17/11 08:50
10160655008	**CML-SW-04**	Water	06/15/11 13:20	06/17/11 08:50
10160655009	**CML-SW-13**	Water	06/15/11 12:39	06/17/11 08:50
10160655010	**CML-SW-05**	Water	06/15/11 12:35	06/17/11 08:50
10160655011	**CML-SW-11**	Water	06/15/11 14:16	06/17/11 08:50

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SAMPLE ANALYTE COUNT

Project: Black Pine Mine
Pace Project No.: 10160655

Lab ID	Sample ID	Method	Analysts	Analytes Reported	Laboratory
10160655001	**CML-SW-07**	EPA 200.8	CJS, TL1	12	PASI-M
		SM 2310	CAC	1	PASI-MT
		SM 2540D	SR1	1	PASI-MT
		EPA 300.0	JH1	1	PASI-MT
		SM 2320B	MWD	1	PASI-M
		SM 2540C	PH1	1	PASI-M
10160655002	**CML-SW-03**	EPA 200.8	CJS, TL1	12	PASI-M
		SM 2310	CAC	1	PASI-MT
		SM 2540D	SR1	1	PASI-MT
		EPA 300.0	JH1	1	PASI-MT
		SM 2320B	MWD	1	PASI-M
		SM 2540C	PH1	1	PASI-M
10160655003	**CML-SW-08**	EPA 200.8	CJS, TL1	12	PASI-M
		SM 2310	CAC	1	PASI-MT
		SM 2540D	SR1	1	PASI-MT
		EPA 300.0	JH1	1	PASI-MT
		SM 2320B	MWD	1	PASI-M
		SM 2540C	PH1	1	PASI-M
10160655004	**CML-SW-10**	EPA 200.8	CJS, TL1	12	PASI-M
		SM 2310	CAC	1	PASI-MT
		SM 2540D	SR1	1	PASI-MT
		EPA 300.0	JH1	1	PASI-MT
		SM 2320B	MWD	1	PASI-M
		SM 2540C	PH1	1	PASI-M
10160655005	**CML-SW-16**	EPA 200.8	CJS, TL1	12	PASI-M
		SM 2310	CAC	1	PASI-MT
		SM 2540D	SR1	1	PASI-MT
		EPA 300.0	JH1	1	PASI-MT
		SM 2320B	MWD	1	PASI-M
		SM 2540C	CAP	1	PASI-M
10160655006	**CML-SW-15**	EPA 200.8	CJS, TL1	12	PASI-M
		SM 2310	CAC	1	PASI-MT
		SM 2540D	SR1	1	PASI-MT
		EPA 300.0	JH1	1	PASI-MT
		SM 2320B	MWD	1	PASI-M
		SM 2540C	CAP	1	PASI-M
10160655007	**CML-Q1-T1**	EPA 200.8	CJS, TL1	12	PASI-M

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SAMPLE ANALYTE COUNT

Project: Black Pine Mine
Pace Project No.: 10160655

Lab ID	Sample ID	Method	Analysts	Analytes Reported	Laboratory
10160655008	**CML-SW-04**	EPA 200.8	CJS, TL1	12	PASI-M
		SM 2310	CAC	1	PASI-MT
		SM 2540D	SR1	1	PASI-MT
		EPA 300.0	JH1	1	PASI-MT
		SM 2320B	MWD	1	PASI-M
		SM 2540C	CAP	1	PASI-M
10160655009	**CML-SW-13**	EPA 200.8	CJS, TL1	12	PASI-M
		SM 2310	CAC	1	PASI-MT
		SM 2540D	SR1	1	PASI-MT
		EPA 300.0	JH1	1	PASI-MT
		SM 2320B	MWD	1	PASI-M
		SM 2540C	CAP	1	PASI-M
10160655010	**CML-SW-05**	EPA 200.8	CJS, TL1	12	PASI-M
		SM 2310	CAC	1	PASI-MT
		SM 2540D	SR1	1	PASI-MT
		EPA 300.0	JH1	1	PASI-MT
		SM 2320B	MWD	1	PASI-M
		SM 2540C	CAP	1	PASI-M
10160655011	**CML-SW-11**	EPA 200.8	CJS, TL1	12	PASI-M
		SM 2310	CAC	1	PASI-MT
		SM 2540D	SR1	1	PASI-MT
		EPA 300.0	JH1	1	PASI-MT
		SM 2320B	MWD	1	PASI-M
		SM 2540C	CAP	1	PASI-M

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PROJECT NARRATIVE

Project: Black Pine Mine
Pace Project No.: 10160655

Method: **EPA 200.8**
Description: 200.8 MET ICPMS
Client: Montana Dept. of Environmental Quality
Date: June 30, 2011

General Information:
11 samples were analyzed for EPA 200.8. All samples were received in acceptable condition with any exceptions noted below.

Hold Time:
The samples were analyzed within the method required hold times with any exceptions noted below.

Sample Preparation:
The samples were prepared in accordance with EPA 200.8 with any exceptions noted below.

Initial Calibrations (including MS Tune as applicable):
All criteria were within method requirements with any exceptions noted below.

Continuing Calibration:
All criteria were within method requirements with any exceptions noted below.

Internal Standards:
All internal standards were within QC limits with any exceptions noted below.

Method Blank:
All analytes were below the report limit in the method blank with any exceptions noted below.

Laboratory Control Spike:
All laboratory control spike compounds were within QC limits with any exceptions noted below.

Matrix Spikes:
All percent recoveries and relative percent differences (RPDs) were within acceptance criteria with any exceptions noted below.

QC Batch: MPRP/26726

A matrix spike and matrix spike duplicate (MS/MSD) were performed on the following sample(s): 10160655001,10160673004

M1: Matrix spike recovery exceeded QC limits. Batch accepted based on laboratory control sample (LCS) recovery.

- MS (Lab ID: 998292)
  - Iron
- MS (Lab ID: 998294)
  - Iron
- MSD (Lab ID: 998293)
  - Iron

Duplicate Sample:
All duplicate sample results were within method acceptance criteria with any exceptions noted below.

Additional Comments:

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PROJECT NARRATIVE

Project: Black Pine Mine
Pace Project No.: 10160655

Method: **SM 2310**
Description: 2310 Acidity
Client: Montana Dept. of Environmental Quality
Date: June 30, 2011

General Information:
10 samples were analyzed for SM 2310. All samples were received in acceptable condition with any exceptions noted below.

Hold Time:
The samples were analyzed within the method required hold times with any exceptions noted below.

Initial Calibrations (including MS Tune as applicable):
All criteria were within method requirements with any exceptions noted below.

Continuing Calibration:
All criteria were within method requirements with any exceptions noted below.

Internal Standards:
All internal standards were within QC limits with any exceptions noted below.

Surrogates:
All surrogates were within QC limits with any exceptions noted below.

Method Blank:
All analytes were below the report limit in the method blank with any exceptions noted below.

Laboratory Control Spike:
All laboratory control spike compounds were within QC limits with any exceptions noted below.

Matrix Spikes:
All percent recoveries and relative percent differences (RPDs) were within acceptance criteria with any exceptions noted below.

Duplicate Sample:
All duplicate sample results were within method acceptance criteria with any exceptions noted below.

Additional Comments:

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PROJECT NARRATIVE

Project: Black Pine Mine
Pace Project No.: 10160655

Method: **SM 2540D**
Description: 2540D Total Suspended Solids
Client: Montana Dept. of Environmental Quality
Date: June 30, 2011

General Information:
10 samples were analyzed for SM 2540D. All samples were received in acceptable condition with any exceptions noted below.

Hold Time:
The samples were analyzed within the method required hold times with any exceptions noted below.

Initial Calibrations (including MS Tune as applicable):
All criteria were within method requirements with any exceptions noted below.

Continuing Calibration:
All criteria were within method requirements with any exceptions noted below.

Internal Standards:
All internal standards were within QC limits with any exceptions noted below.

Surrogates:
All surrogates were within QC limits with any exceptions noted below.

Method Blank:
All analytes were below the report limit in the method blank with any exceptions noted below.

Laboratory Control Spike:
All laboratory control spike compounds were within QC limits with any exceptions noted below.

Matrix Spikes:
All percent recoveries and relative percent differences (RPDs) were within acceptance criteria with any exceptions noted below.

Duplicate Sample:
All duplicate sample results were within method acceptance criteria with any exceptions noted below.

Additional Comments:

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PROJECT NARRATIVE

Project: Black Pine Mine
Pace Project No.: 10160655

Method: **EPA 300.0**
Description: 300.0 IC Anions
Client: Montana Dept. of Environmental Quality
Date: June 30, 2011

General Information:
10 samples were analyzed for EPA 300.0. All samples were received in acceptable condition with any exceptions noted below.

Hold Time:
The samples were analyzed within the method required hold times with any exceptions noted below.

Initial Calibrations (including MS Tune as applicable):
All criteria were within method requirements with any exceptions noted below.

Continuing Calibration:
All criteria were within method requirements with any exceptions noted below.

Internal Standards:
All internal standards were within QC limits with any exceptions noted below.

Surrogates:
All surrogates were within QC limits with any exceptions noted below.

Method Blank:
All analytes were below the report limit in the method blank with any exceptions noted below.

Laboratory Control Spike:
All laboratory control spike compounds were within QC limits with any exceptions noted below.

Matrix Spikes:
All percent recoveries and relative percent differences (RPDs) were within acceptance criteria with any exceptions noted below.

Duplicate Sample:
All duplicate sample results were within method acceptance criteria with any exceptions noted below.

QC Batch: MT/6195

D6: The relative percent difference (RPD) between the sample and sample duplicate exceeded laboratory control limits.

- DUP (Lab ID: 998641)
  - Sulfate

Additional Comments:

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PROJECT NARRATIVE

Project: Black Pine Mine
Pace Project No.: 10160655

Method: **SM 2320B**
Description: 2320B Alkalinity
Client: Montana Dept. of Environmental Quality
Date: June 30, 2011

General Information:
10 samples were analyzed for SM 2320B. All samples were received in acceptable condition with any exceptions noted below.

Hold Time:
The samples were analyzed within the method required hold times with any exceptions noted below.

Method Blank:
All analytes were below the report limit in the method blank with any exceptions noted below.

Laboratory Control Spike:
All laboratory control spike compounds were within QC limits with any exceptions noted below.

Matrix Spikes:
All percent recoveries and relative percent differences (RPDs) were within acceptance criteria with any exceptions noted below.

QC Batch: WET/22674

A matrix spike and matrix spike duplicate (MS/MSD) were performed on the following sample(s): 10160707001,10160722002

M1: Matrix spike recovery exceeded QC limits. Batch accepted based on laboratory control sample (LCS) recovery.

- MS (Lab ID: 998343)
  - Alkalinity, Total as CaCO3
- MSD (Lab ID: 998344)
  - Alkalinity, Total as CaCO3

Duplicate Sample:
All duplicate sample results were within method acceptance criteria with any exceptions noted below.

Additional Comments:

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PROJECT NARRATIVE

Project: Black Pine Mine
Pace Project No.: 10160655

Method: **SM 2540C**
Description: 2540C Total Dissolved Solids
Client: Montana Dept. of Environmental Quality
Date: June 30, 2011

General Information:
10 samples were analyzed for SM 2540C. All samples were received in acceptable condition with any exceptions noted below.

Hold Time:
The samples were analyzed within the method required hold times with any exceptions noted below.

Method Blank:
All analytes were below the report limit in the method blank with any exceptions noted below.

Laboratory Control Spike:
All laboratory control spike compounds were within QC limits with any exceptions noted below.

Matrix Spikes:
All percent recoveries and relative percent differences (RPDs) were within acceptance criteria with any exceptions noted below.

Duplicate Sample:
All duplicate sample results were within method acceptance criteria with any exceptions noted below.

Additional Comments:

This data package has been reviewed for quality and completeness and is approved for release.

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ANALYTICAL RESULTS

Project: Black Pine Mine
Pace Project No.: 10160655

Sample: CML-SW-07 **Lab ID: 10160655001** Collected: 06/14/11 10:05 Received: 06/17/11 08:50 Matrix: Water

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
200.8 MET ICPMS	Analytical Method: EPA 200.8 Preparation Method: EPA 200.8							
Antimony	**42.9**	ug/L	0.50	1	06/28/11 15:18	06/30/11 05:30	7440-36-0	
Arsenic	**12.8**	ug/L	0.50	1	06/28/11 15:18	06/30/11 05:30	7440-38-2	
Barium	**81.7**	ug/L	0.30	1	06/28/11 15:18	06/30/11 05:30	7440-39-3	
Cadmium	**1.2**	ug/L	0.080	1	06/28/11 15:18	06/30/11 05:30	7440-43-9	
Chromium	**1.3**	ug/L	0.50	1	06/28/11 15:18	06/30/11 05:30	7440-47-3	
Copper	**221**	ug/L	0.50	1	06/28/11 15:18	06/30/11 05:30	7440-50-8	
Iron	**1430**	ug/L	50.0	1	06/28/11 15:18	06/30/11 05:30	7439-89-6	M1
Lead	**49.0**	ug/L	0.10	1	06/28/11 15:18	06/30/11 05:30	7439-92-1	
Manganese	**12.9**	ug/L	0.50	1	06/28/11 15:18	06/30/11 05:30	7439-96-5	
Nickel	**2.1**	ug/L	0.50	1	06/28/11 15:18	06/30/11 05:30	7440-02-0	
Silver	**0.64**	ug/L	0.50	1	06/28/11 15:18	06/30/11 13:56	7440-22-4	
Zinc	**40.5**	ug/L	5.0	1	06/28/11 15:18	06/30/11 05:30	7440-66-6	
2310 Acidity	Analytical Method: SM 2310							
Acidity	**23.4**	mg/L	5.0	1		06/24/11 16:00		
2540D Total Suspended Solids	Analytical Method: SM 2540D							
Total Suspended Solids	**1.8**	mg/L	1.0	1		06/20/11 10:40		
300.0 IC Anions	Analytical Method: EPA 300.0							
Sulfate	**8.0**	mg/L	1.0	1		06/24/11 09:10	14808-79-8	
2320B Alkalinity	Analytical Method: SM 2320B							
Alkalinity, Total as CaCO3	**12.1**	mg/L	5.0	1		06/20/11 11:46		
2540C Total Dissolved Solids	Analytical Method: SM 2540C							
Total Dissolved Solids	**94.0**	mg/L	10.0	1		06/20/11 11:21		

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ANALYTICAL RESULTS

Project: Black Pine Mine
Pace Project No.: 10160655

Sample: CML-SW-03 **Lab ID: 10160655002** Collected: 06/15/11 08:20 Received: 06/17/11 08:50 Matrix: Water

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
200.8 MET ICPMS	Analytical Method: EPA 200.8 Preparation Method: EPA 200.8							
Antimony	**1.9**	ug/L	0.50	1	06/28/11 15:18	06/30/11 05:17	7440-36-0	
Arsenic	**2.3**	ug/L	0.50	1	06/28/11 15:18	06/30/11 05:17	7440-38-2	
Barium	**59.1**	ug/L	0.30	1	06/28/11 15:18	06/30/11 05:17	7440-39-3	
Cadmium	**<0.080**	ug/L	0.080	1	06/28/11 15:18	06/30/11 05:17	7440-43-9	
Chromium	**1.2**	ug/L	0.50	1	06/28/11 15:18	06/30/11 05:17	7440-47-3	
Copper	**20.8**	ug/L	0.50	1	06/28/11 15:18	06/30/11 05:17	7440-50-8	
Iron	**1450**	ug/L	50.0	1	06/28/11 15:18	06/30/11 05:17	7439-89-6	
Lead	**2.9**	ug/L	0.10	1	06/28/11 15:18	06/30/11 05:17	7439-92-1	
Manganese	**8.8**	ug/L	0.50	1	06/28/11 15:18	06/30/11 05:17	7439-96-5	
Nickel	**1.7**	ug/L	0.50	1	06/28/11 15:18	06/30/11 05:17	7440-02-0	
Silver	**<0.50**	ug/L	0.50	1	06/28/11 15:18	06/30/11 13:59	7440-22-4	
Zinc	**10.5**	ug/L	5.0	1	06/28/11 15:18	06/30/11 05:17	7440-66-6	
2310 Acidity	Analytical Method: SM 2310							
Acidity	**13.9**	mg/L	5.0	1		06/24/11 16:00		
2540D Total Suspended Solids	Analytical Method: SM 2540D							
Total Suspended Solids	**2.0**	mg/L	1.0	1		06/20/11 10:40		
300.0 IC Anions	Analytical Method: EPA 300.0							
Sulfate	**6.7**	mg/L	1.0	1		06/24/11 02:03	14808-79-8	
2320B Alkalinity	Analytical Method: SM 2320B							
Alkalinity, Total as CaCO3	**11.7**	mg/L	5.0	1		06/20/11 12:27		
2540C Total Dissolved Solids	Analytical Method: SM 2540C							
Total Dissolved Solids	**103**	mg/L	10.0	1		06/20/11 11:28		

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ANALYTICAL RESULTS

Project: Black Pine Mine
Pace Project No.: 10160655

Sample: CML-SW-08 **Lab ID: 10160655003** Collected: 06/15/11 15:20 Received: 06/17/11 08:50 Matrix: Water

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
200.8 MET ICPMS	Analytical Method: EPA 200.8 Preparation Method: EPA 200.8							
Antimony	**3.4**	ug/L	0.50	1	06/28/11 15:18	06/30/11 05:21	7440-36-0	
Arsenic	**1.7**	ug/L	0.50	1	06/28/11 15:18	06/30/11 05:21	7440-38-2	
Barium	**37.7**	ug/L	0.30	1	06/28/11 15:18	06/30/11 05:21	7440-39-3	
Cadmium	**0.12**	ug/L	0.080	1	06/28/11 15:18	06/30/11 05:21	7440-43-9	
Chromium	**0.68**	ug/L	0.50	1	06/28/11 15:18	06/30/11 05:21	7440-47-3	
Copper	**16.7**	ug/L	0.50	1	06/28/11 15:18	06/30/11 05:21	7440-50-8	
Iron	**381**	ug/L	50.0	1	06/28/11 15:18	06/30/11 05:21	7439-89-6	
Lead	**3.7**	ug/L	0.10	1	06/28/11 15:18	06/30/11 05:21	7439-92-1	
Manganese	**5.8**	ug/L	0.50	1	06/28/11 15:18	06/30/11 05:21	7439-96-5	
Nickel	**0.72**	ug/L	0.50	1	06/28/11 15:18	06/30/11 05:21	7440-02-0	
Silver	**<0.50**	ug/L	0.50	1	06/28/11 15:18	06/30/11 14:03	7440-22-4	
Zinc	**12.5**	ug/L	5.0	1	06/28/11 15:18	06/30/11 05:21	7440-66-6	
2310 Acidity	Analytical Method: SM 2310							
Acidity	**16.7**	mg/L	5.0	1		06/24/11 16:00		
2540D Total Suspended Solids	Analytical Method: SM 2540D							
Total Suspended Solids	**2.1**	mg/L	1.0	1		06/20/11 10:40		
300.0 IC Anions	Analytical Method: EPA 300.0							
Sulfate	**3.4**	mg/L	1.0	1		06/24/11 02:31	14808-79-8	
2320B Alkalinity	Analytical Method: SM 2320B							
Alkalinity, Total as CaCO3	**7.4**	mg/L	5.0	1		06/20/11 12:30		
2540C Total Dissolved Solids	Analytical Method: SM 2540C							
Total Dissolved Solids	**50.0**	mg/L	10.0	1		06/20/11 11:31		

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ANALYTICAL RESULTS

Project: Black Pine Mine
Pace Project No.: 10160655

Sample: CML-SW-10 **Lab ID: 10160655004** Collected: 06/15/11 14:51 Received: 06/17/11 08:50 Matrix: Water

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
200.8 MET ICPMS	Analytical Method: EPA 200.8 Preparation Method: EPA 200.8							
Antimony	**2.4**	ug/L	0.50	1	06/28/11 15:18	06/30/11 05:26	7440-36-0	
Arsenic	**1.2**	ug/L	0.50	1	06/28/11 15:18	06/30/11 05:26	7440-38-2	
Barium	**37.0**	ug/L	0.30	1	06/28/11 15:18	06/30/11 05:26	7440-39-3	
Cadmium	**0.12**	ug/L	0.080	1	06/28/11 15:18	06/30/11 05:26	7440-43-9	
Chromium	**0.90**	ug/L	0.50	1	06/28/11 15:18	06/30/11 05:26	7440-47-3	
Copper	**13.8**	ug/L	0.50	1	06/28/11 15:18	06/30/11 05:26	7440-50-8	
Iron	**338**	ug/L	50.0	1	06/28/11 15:18	06/30/11 05:26	7439-89-6	
Lead	**2.7**	ug/L	0.10	1	06/28/11 15:18	06/30/11 05:26	7439-92-1	
Manganese	**5.2**	ug/L	0.50	1	06/28/11 15:18	06/30/11 05:26	7439-96-5	
Nickel	**1.6**	ug/L	0.50	1	06/28/11 15:18	06/30/11 05:26	7440-02-0	
Silver	**<0.50**	ug/L	0.50	1	06/28/11 15:18	06/30/11 14:07	7440-22-4	
Zinc	**9.4**	ug/L	5.0	1	06/28/11 15:18	06/30/11 05:26	7440-66-6	
2310 Acidity	Analytical Method: SM 2310							
Acidity	**21.5**	mg/L	5.0	1		06/24/11 16:00		
2540D Total Suspended Solids	Analytical Method: SM 2540D							
Total Suspended Solids	**2.0**	mg/L	1.0	1		06/20/11 10:40		
300.0 IC Anions	Analytical Method: EPA 300.0							
Sulfate	**3.3**	mg/L	1.0	1		06/24/11 03:00	14808-79-8	
2320B Alkalinity	Analytical Method: SM 2320B							
Alkalinity, Total as CaCO3	**7.3**	mg/L	5.0	1		06/20/11 12:33		
2540C Total Dissolved Solids	Analytical Method: SM 2540C							
Total Dissolved Solids	**63.0**	mg/L	10.0	1		06/20/11 11:31		

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ANALYTICAL RESULTS

Project: Black Pine Mine
Pace Project No.: 10160655

Sample: CML-SW-16 **Lab ID: 10160655005** Collected: 06/15/11 14:09 Received: 06/17/11 08:50 Matrix: Water

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
200.8 MET ICPMS	Analytical Method: EPA 200.8 Preparation Method: EPA 200.8							
Antimony	**1.6**	ug/L	0.50	1	06/28/11 15:18	06/30/11 06:06	7440-36-0	
Arsenic	**1.2**	ug/L	0.50	1	06/28/11 15:18	06/30/11 06:06	7440-38-2	
Barium	**42.8**	ug/L	0.30	1	06/28/11 15:18	06/30/11 06:06	7440-39-3	
Cadmium	**0.11**	ug/L	0.080	1	06/28/11 15:18	06/30/11 06:06	7440-43-9	
Chromium	**0.78**	ug/L	0.50	1	06/28/11 15:18	06/30/11 06:06	7440-47-3	
Copper	**11.8**	ug/L	0.50	1	06/28/11 15:18	06/30/11 06:06	7440-50-8	
Iron	**356**	ug/L	50.0	1	06/28/11 15:18	06/30/11 06:06	7439-89-6	
Lead	**5.1**	ug/L	0.10	1	06/28/11 15:18	06/30/11 06:06	7439-92-1	
Manganese	**5.5**	ug/L	0.50	1	06/28/11 15:18	06/30/11 06:06	7439-96-5	
Nickel	**0.72**	ug/L	0.50	1	06/28/11 15:18	06/30/11 06:06	7440-02-0	
Silver	**<0.50**	ug/L	0.50	1	06/28/11 15:18	06/30/11 14:10	7440-22-4	
Zinc	**6.1**	ug/L	5.0	1	06/28/11 15:18	06/30/11 06:06	7440-66-6	
2310 Acidity	Analytical Method: SM 2310							
Acidity	**8.2**	mg/L	5.0	1		06/24/11 16:00		
2540D Total Suspended Solids	Analytical Method: SM 2540D							
Total Suspended Solids	**<2.0**	mg/L	2.0	1		06/20/11 10:40		
300.0 IC Anions	Analytical Method: EPA 300.0							
Sulfate	**2.8**	mg/L	1.0	1		06/24/11 03:28	14808-79-8	
2320B Alkalinity	Analytical Method: SM 2320B							
Alkalinity, Total as CaCO3	**8.0**	mg/L	5.0	1		06/20/11 12:37		
2540C Total Dissolved Solids	Analytical Method: SM 2540C							
Total Dissolved Solids	**34.0**	mg/L	10.0	1		06/22/11 11:27		

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ANALYTICAL RESULTS

Project: Black Pine Mine
Pace Project No.: 10160655

Sample: CML-SW-15 **Lab ID: 10160655006** Collected: 06/15/11 13:35 Received: 06/17/11 08:50 Matrix: Water

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
200.8 MET ICPMS	Analytical Method: EPA 200.8 Preparation Method: EPA 200.8							
Antimony	**<0.50**	ug/L	0.50	1	06/28/11 15:18	06/30/11 06:10	7440-36-0	
Arsenic	**0.68**	ug/L	0.50	1	06/28/11 15:18	06/30/11 06:10	7440-38-2	
Barium	**42.5**	ug/L	0.30	1	06/28/11 15:18	06/30/11 06:10	7440-39-3	
Cadmium	**<0.080**	ug/L	0.080	1	06/28/11 15:18	06/30/11 06:10	7440-43-9	
Chromium	**0.64**	ug/L	0.50	1	06/28/11 15:18	06/30/11 06:10	7440-47-3	
Copper	**5.8**	ug/L	0.50	1	06/28/11 15:18	06/30/11 06:10	7440-50-8	
Iron	**321**	ug/L	50.0	1	06/28/11 15:18	06/30/11 06:10	7439-89-6	
Lead	**0.61**	ug/L	0.10	1	06/28/11 15:18	06/30/11 06:10	7439-92-1	
Manganese	**5.6**	ug/L	0.50	1	06/28/11 15:18	06/30/11 06:10	7439-96-5	
Nickel	**0.62**	ug/L	0.50	1	06/28/11 15:18	06/30/11 06:10	7440-02-0	
Silver	**<0.50**	ug/L	0.50	1	06/28/11 15:18	06/30/11 14:14	7440-22-4	
Zinc	**<5.0**	ug/L	5.0	1	06/28/11 15:18	06/30/11 06:10	7440-66-6	
2310 Acidity	Analytical Method: SM 2310							
Acidity	**12.0**	mg/L	5.0	1		06/24/11 16:00		
2540D Total Suspended Solids	Analytical Method: SM 2540D							
Total Suspended Solids	**2.1**	mg/L	1.0	1		06/20/11 10:40		
300.0 IC Anions	Analytical Method: EPA 300.0							
Sulfate	**3.0**	mg/L	1.0	1		06/24/11 03:57	14808-79-8	
2320B Alkalinity	Analytical Method: SM 2320B							
Alkalinity, Total as CaCO3	**8.3**	mg/L	5.0	1		06/20/11 12:40		
2540C Total Dissolved Solids	Analytical Method: SM 2540C							
Total Dissolved Solids	**34.0**	mg/L	10.0	1		06/22/11 11:27		

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ANALYTICAL RESULTS

Project: Black Pine Mine
Pace Project No.: 10160655

Sample: CML-Q1-T1 **Lab ID: 10160655007** Collected: 06/15/11 13:39 Received: 06/17/11 08:50 Matrix: Water

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
200.8 MET ICPMS	Analytical Method: EPA 200.8 Preparation Method: EPA 200.8							
Antimony	**<0.50**	ug/L	0.50	1	06/28/11 15:18	06/30/11 06:15	7440-36-0	
Arsenic	**0.65**	ug/L	0.50	1	06/28/11 15:18	06/30/11 06:15	7440-38-2	
Barium	**43.4**	ug/L	0.30	1	06/28/11 15:18	06/30/11 06:15	7440-39-3	
Cadmium	**<0.080**	ug/L	0.080	1	06/28/11 15:18	06/30/11 06:15	7440-43-9	
Chromium	**0.79**	ug/L	0.50	1	06/28/11 15:18	06/30/11 06:15	7440-47-3	
Copper	**6.0**	ug/L	0.50	1	06/28/11 15:18	06/30/11 06:15	7440-50-8	
Iron	**340**	ug/L	50.0	1	06/28/11 15:18	06/30/11 06:15	7439-89-6	
Lead	**0.63**	ug/L	0.10	1	06/28/11 15:18	06/30/11 06:15	7439-92-1	
Manganese	**5.8**	ug/L	0.50	1	06/28/11 15:18	06/30/11 06:15	7439-96-5	
Nickel	**0.75**	ug/L	0.50	1	06/28/11 15:18	06/30/11 06:15	7440-02-0	
Silver	**<0.50**	ug/L	0.50	1	06/28/11 15:18	06/30/11 14:38	7440-22-4	
Zinc	**5.2**	ug/L	5.0	1	06/28/11 15:18	06/30/11 06:15	7440-66-6	

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ANALYTICAL RESULTS

Project: Black Pine Mine
Pace Project No.: 10160655

Sample: CML-SW-04 **Lab ID: 10160655008** Collected: 06/15/11 13:20 Received: 06/17/11 08:50 Matrix: Water

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
200.8 MET ICPMS	Analytical Method: EPA 200.8 Preparation Method: EPA 200.8							
Antimony	**<0.50**	ug/L	0.50	1	06/28/11 15:18	06/30/11 06:19	7440-36-0	
Arsenic	**0.53**	ug/L	0.50	1	06/28/11 15:18	06/30/11 06:19	7440-38-2	
Barium	**41.1**	ug/L	0.30	1	06/28/11 15:18	06/30/11 06:19	7440-39-3	
Cadmium	**<0.080**	ug/L	0.080	1	06/28/11 15:18	06/30/11 06:19	7440-43-9	
Chromium	**0.62**	ug/L	0.50	1	06/28/11 15:18	06/30/11 06:19	7440-47-3	
Copper	**3.8**	ug/L	0.50	1	06/28/11 15:18	06/30/11 06:19	7440-50-8	
Iron	**288**	ug/L	50.0	1	06/28/11 15:18	06/30/11 06:19	7439-89-6	
Lead	**0.31**	ug/L	0.10	1	06/28/11 15:18	06/30/11 06:19	7439-92-1	
Manganese	**4.7**	ug/L	0.50	1	06/28/11 15:18	06/30/11 06:19	7439-96-5	
Nickel	**0.54**	ug/L	0.50	1	06/28/11 15:18	06/30/11 06:19	7440-02-0	
Silver	**<0.50**	ug/L	0.50	1	06/28/11 15:18	06/30/11 14:41	7440-22-4	
Zinc	**<5.0**	ug/L	5.0	1	06/28/11 15:18	06/30/11 06:19	7440-66-6	
2310 Acidity	Analytical Method: SM 2310							
Acidity	**10.1**	mg/L	5.0	1		06/24/11 16:00		
2540D Total Suspended Solids	Analytical Method: SM 2540D							
Total Suspended Solids	**1.5**	mg/L	1.0	1		06/20/11 10:40		
300.0 IC Anions	Analytical Method: EPA 300.0							
Sulfate	**2.6**	mg/L	1.0	1		06/24/11 04:25	14808-79-8	
2320B Alkalinity	Analytical Method: SM 2320B							
Alkalinity, Total as CaCO3	**7.8**	mg/L	5.0	1		06/20/11 12:52		
2540C Total Dissolved Solids	Analytical Method: SM 2540C							
Total Dissolved Solids	**29.0**	mg/L	10.0	1		06/22/11 11:28		

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ANALYTICAL RESULTS

Project: Black Pine Mine
Pace Project No.: 10160655

Sample: CML-SW-13 **Lab ID: 10160655009** Collected: 06/15/11 12:39 Received: 06/17/11 08:50 Matrix: Water

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
200.8 MET ICPMS	Analytical Method: EPA 200.8 Preparation Method: EPA 200.8							
Antimony	**<0.50**	ug/L	0.50	1	06/28/11 15:18	06/30/11 06:23	7440-36-0	
Arsenic	**<0.50**	ug/L	0.50	1	06/28/11 15:18	06/30/11 06:23	7440-38-2	
Barium	**40.3**	ug/L	0.30	1	06/28/11 15:18	06/30/11 06:23	7440-39-3	
Cadmium	**<0.080**	ug/L	0.080	1	06/28/11 15:18	06/30/11 06:23	7440-43-9	
Chromium	**0.54**	ug/L	0.50	1	06/28/11 15:18	06/30/11 06:23	7440-47-3	
Copper	**2.1**	ug/L	0.50	1	06/28/11 15:18	06/30/11 06:23	7440-50-8	
Iron	**168**	ug/L	50.0	1	06/28/11 15:18	06/30/11 06:23	7439-89-6	
Lead	**0.18**	ug/L	0.10	1	06/28/11 15:18	06/30/11 06:23	7439-92-1	
Manganese	**3.4**	ug/L	0.50	1	06/28/11 15:18	06/30/11 06:23	7439-96-5	
Nickel	**0.77**	ug/L	0.50	1	06/28/11 15:18	06/30/11 06:23	7440-02-0	
Silver	**<0.50**	ug/L	0.50	1	06/28/11 15:18	06/30/11 14:45	7440-22-4	
Zinc	**6.8**	ug/L	5.0	1	06/28/11 15:18	06/30/11 06:23	7440-66-6	
2310 Acidity	Analytical Method: SM 2310							
Acidity	**<5.0**	mg/L	5.0	1		06/24/11 16:00		
2540D Total Suspended Solids	Analytical Method: SM 2540D							
Total Suspended Solids	**1.1**	mg/L	1.0	1		06/20/11 10:40		
300.0 IC Anions	Analytical Method: EPA 300.0							
Sulfate	**2.0**	mg/L	1.0	1		06/24/11 04:54	14808-79-8	
2320B Alkalinity	Analytical Method: SM 2320B							
Alkalinity, Total as CaCO3	**7.6**	mg/L	5.0	1		06/20/11 12:55		
2540C Total Dissolved Solids	Analytical Method: SM 2540C							
Total Dissolved Solids	**26.0**	mg/L	10.0	1		06/22/11 11:29		

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ANALYTICAL RESULTS

Project: Black Pine Mine
Pace Project No.: 10160655

Sample: CML-SW-05 **Lab ID: 10160655010** Collected: 06/15/11 12:35 Received: 06/17/11 08:50 Matrix: Water

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
200.8 MET ICPMS	Analytical Method: EPA 200.8 Preparation Method: EPA 200.8							
Antimony	**<0.50**	ug/L	0.50	1	06/28/11 15:18	06/30/11 06:28	7440-36-0	
Arsenic	**<0.50**	ug/L	0.50	1	06/28/11 15:18	06/30/11 06:28	7440-38-2	
Barium	**39.6**	ug/L	0.30	1	06/28/11 15:18	06/30/11 06:28	7440-39-3	
Cadmium	**<0.080**	ug/L	0.080	1	06/28/11 15:18	06/30/11 06:28	7440-43-9	
Chromium	**<0.50**	ug/L	0.50	1	06/28/11 15:18	06/30/11 06:28	7440-47-3	
Copper	**1.0**	ug/L	0.50	1	06/28/11 15:18	06/30/11 06:28	7440-50-8	
Iron	**162**	ug/L	50.0	1	06/28/11 15:18	06/30/11 06:28	7439-89-6	
Lead	**0.12**	ug/L	0.10	1	06/28/11 15:18	06/30/11 06:28	7439-92-1	
Manganese	**2.5**	ug/L	0.50	1	06/28/11 15:18	06/30/11 06:28	7439-96-5	
Nickel	**<0.50**	ug/L	0.50	1	06/28/11 15:18	06/30/11 06:28	7440-02-0	
Silver	**<0.50**	ug/L	0.50	1	06/28/11 15:18	06/30/11 14:48	7440-22-4	
Zinc	**<5.0**	ug/L	5.0	1	06/28/11 15:18	06/30/11 06:28	7440-66-6	
2310 Acidity	Analytical Method: SM 2310							
Acidity	**20.5**	mg/L	5.0	1		06/24/11 16:00		
2540D Total Suspended Solids	Analytical Method: SM 2540D							
Total Suspended Solids	**1.4**	mg/L	1.1	1		06/20/11 10:40		
300.0 IC Anions	Analytical Method: EPA 300.0							
Sulfate	**2.0**	mg/L	1.0	1		06/24/11 05:22	14808-79-8	
2320B Alkalinity	Analytical Method: SM 2320B							
Alkalinity, Total as CaCO3	**7.2**	mg/L	5.0	1		06/20/11 12:58		
2540C Total Dissolved Solids	Analytical Method: SM 2540C							
Total Dissolved Solids	**24.0**	mg/L	10.0	1		06/22/11 11:29		

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ANALYTICAL RESULTS

Project: Black Pine Mine
Pace Project No.: 10160655

Sample: CML-SW-11 **Lab ID: 10160655011** Collected: 06/15/11 14:16 Received: 06/17/11 08:50 Matrix: Water

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
200.8 MET ICPMS	Analytical Method: EPA 200.8 Preparation Method: EPA 200.8							
Antimony	**1.7**	ug/L	0.50	1	06/28/11 15:18	06/30/11 06:32	7440-36-0	
Arsenic	**0.90**	ug/L	0.50	1	06/28/11 15:18	06/30/11 06:32	7440-38-2	
Barium	**42.0**	ug/L	0.30	1	06/28/11 15:18	06/30/11 06:32	7440-39-3	
Cadmium	**0.090**	ug/L	0.080	1	06/28/11 15:18	06/30/11 06:32	7440-43-9	
Chromium	**0.75**	ug/L	0.50	1	06/28/11 15:18	06/30/11 06:32	7440-47-3	
Copper	**11.6**	ug/L	0.50	1	06/28/11 15:18	06/30/11 06:32	7440-50-8	
Iron	**400**	ug/L	50.0	1	06/28/11 15:18	06/30/11 06:32	7439-89-6	
Lead	**1.7**	ug/L	0.10	1	06/28/11 15:18	06/30/11 06:32	7439-92-1	
Manganese	**5.8**	ug/L	0.50	1	06/28/11 15:18	06/30/11 06:32	7439-96-5	
Nickel	**0.77**	ug/L	0.50	1	06/28/11 15:18	06/30/11 06:32	7440-02-0	
Silver	**<0.50**	ug/L	0.50	1	06/28/11 15:18	06/30/11 14:51	7440-22-4	
Zinc	**7.2**	ug/L	5.0	1	06/28/11 15:18	06/30/11 06:32	7440-66-6	
2310 Acidity	Analytical Method: SM 2310							
Acidity	**7.3**	mg/L	5.0	1		06/24/11 16:00		
2540D Total Suspended Solids	Analytical Method: SM 2540D							
Total Suspended Solids	**1.8**	mg/L	1.0	1		06/20/11 10:40		
300.0 IC Anions	Analytical Method: EPA 300.0							
Sulfate	**2.9**	mg/L	1.0	1		06/24/11 05:51	14808-79-8	
2320B Alkalinity	Analytical Method: SM 2320B							
Alkalinity, Total as CaCO3	**9.2**	mg/L	5.0	1		06/20/11 13:02		
2540C Total Dissolved Solids	Analytical Method: SM 2540C							
Total Dissolved Solids	**36.0**	mg/L	10.0	1		06/22/11 11:30		

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QUALITY CONTROL DATA

Project: Black Pine Mine
Pace Project No.: 10160655

QC Batch: MPRP/26726 Analysis Method: EPA 200.8
QC Batch Method: EPA 200.8 Analysis Description: 200.8 MET
Associated Lab Samples: 10160655001, 10160655002, 10160655003, 10160655004, 10160655005, 10160655006, 10160655007, 10160655008, 10160655009, 10160655010, 10160655011

METHOD BLANK: 998290 Matrix: Water
Associated Lab Samples: 10160655001, 10160655002, 10160655003, 10160655004, 10160655005, 10160655006, 10160655007, 10160655008, 10160655009, 10160655010, 10160655011

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Antimony	ug/L	<0.50	0.50	06/30/11 06:01	
Arsenic	ug/L	<0.50	0.50	06/30/11 06:01	
Barium	ug/L	<0.30	0.30	06/30/11 06:01	
Cadmium	ug/L	<0.080	0.080	06/30/11 06:01	
Chromium	ug/L	<0.50	0.50	06/30/11 06:01	
Copper	ug/L	<0.50	0.50	06/30/11 06:01	
Iron	ug/L	<50.0	50.0	06/30/11 06:01	
Lead	ug/L	<0.10	0.10	06/30/11 06:01	
Manganese	ug/L	<0.50	0.50	06/30/11 06:01	
Nickel	ug/L	<0.50	0.50	06/30/11 06:01	
Silver	ug/L	<0.50	0.50	06/30/11 06:01	
Zinc	ug/L	<5.0	5.0	06/30/11 06:01	

LABORATORY CONTROL SAMPLE: 998291

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Antimony	ug/L	80	79.8	100	85-115	
Arsenic	ug/L	80	82.4	103	85-115	
Barium	ug/L	80	81.9	102	85-115	
Cadmium	ug/L	80	81.5	102	85-115	
Chromium	ug/L	80	81.8	102	85-115	
Copper	ug/L	80	85.5	107	85-115	
Iron	ug/L	1000	1020	102	85-115	
Lead	ug/L	80	81.7	102	85-115	
Manganese	ug/L	80	82.0	102	85-115	
Nickel	ug/L	80	79.6	99	85-115	
Silver	ug/L	80	86.3	108	85-115	
Zinc	ug/L	80	77.7	97	85-115	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 998292 998293

Parameter	Units	10160655001 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Antimony	ug/L	42.9	80	80	125	128	103	106	70-130	2	20	
Arsenic	ug/L	12.8	80	80	95.3	95.4	103	103	70-130	.1	20	
Barium	ug/L	81.7	80	80	170	170	111	110	70-130	.5	20	
Cadmium	ug/L	1.2	80	80	84.3	82.5	104	102	70-130	2	20	
Chromium	ug/L	1.3	80	80	85.1	84.1	105	104	70-130	1	20	

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QUALITY CONTROL DATA

Project: Black Pine Mine
Pace Project No.: 10160655

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 998292 998293

Parameter	Units	10160655001 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Copper	ug/L	221	80	80	314	311	116	114	70-130	.7	20	
Iron	ug/L	1430	1000	1000	2810	2900	138	147	70-130	3	20	M1
Lead	ug/L	49.0	80	80	133	134	104	106	70-130	.8	20	
Manganese	ug/L	12.9	80	80	96.2	96.9	104	105	70-130	.7	20	
Nickel	ug/L	2.1	80	80	81.6	81.0	99	99	70-130	.8	20	
Silver	ug/L	0.64	80	80	80.9	84.1	100	104	70-130	4	20	
Zinc	ug/L	40.5	80	80	122	120	101	99	70-130	2	20	

MATRIX SPIKE SAMPLE: 998294

Parameter	Units	10160673004 Result	Spike Conc.	MS Result	MS % Rec	% Rec Limits	Qualifiers
Antimony	ug/L	0.53	80	78.9	98	70-130	
Arsenic	ug/L	1.1	80	82.3	101	70-130	
Barium	ug/L	85.4	80	169	104	70-130	
Cadmium	ug/L	<0.080	80	80.3	100	70-130	
Chromium	ug/L	1.3	80	83.0	102	70-130	
Copper	ug/L	22.5	80	106	104	70-130	
Iron	ug/L	1000	1000	2310	131	70-130	M1
Lead	ug/L	0.97	80	81.2	100	70-130	
Manganese	ug/L	8.9	80	89.0	100	70-130	
Nickel	ug/L	2.2	80	79.7	97	70-130	
Silver	ug/L	<0.50	80	78.7	98	70-130	
Zinc	ug/L	8.2	80	85.9	97	70-130	

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QUALITY CONTROL DATA

Project: Black Pine Mine
Pace Project No.: 10160655

QC Batch: MT/6228 Analysis Method: SM 2310
QC Batch Method: SM 2310 Analysis Description: 2310 Acidity
Associated Lab Samples: 10160655001, 10160655002, 10160655003, 10160655004, 10160655005, 10160655006, 10160655008, 10160655009, 10160655010, 10160655011

METHOD BLANK: 1000993 Matrix: Water
Associated Lab Samples: 10160655001, 10160655002, 10160655003, 10160655004, 10160655005, 10160655006, 10160655008, 10160655009, 10160655010, 10160655011

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Acidity	mg/L	<5.0	5.0	06/24/11 16:00	

SAMPLE DUPLICATE: 1000995

Parameter	Units	10160655003 Result	Dup Result	RPD	Max RPD	Qualifiers
Acidity	mg/L	16.7	16.7	0	20	

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QUALITY CONTROL DATA

Project: Black Pine Mine
Pace Project No.: 10160655

QC Batch: MT/6192 Analysis Method: SM 2540D
QC Batch Method: SM 2540D Analysis Description: 2540D Total Suspended Solids
Associated Lab Samples: 10160655001, 10160655002, 10160655003, 10160655004, 10160655005, 10160655006, 10160655008, 10160655009, 10160655010, 10160655011

METHOD BLANK: 998564 Matrix: Water
Associated Lab Samples: 10160655001, 10160655002, 10160655003, 10160655004, 10160655005, 10160655006, 10160655008, 10160655009, 10160655010, 10160655011

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Total Suspended Solids	mg/L	<1.0	1.0	06/20/11 10:40	

LABORATORY CONTROL SAMPLE: 998563

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Total Suspended Solids	mg/L	25	25.0	100	71-129	

SAMPLE DUPLICATE: 998919

Parameter	Units	10160673006 Result	Dup Result	RPD	Max RPD	Qualifiers
Total Suspended Solids	mg/L	<2.0	<2.0		20	

SAMPLE DUPLICATE: 998920

Parameter	Units	10160655005 Result	Dup Result	RPD	Max RPD	Qualifiers
Total Suspended Solids	mg/L	<2.0	2.2		20	

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QUALITY CONTROL DATA

Project: Black Pine Mine
Pace Project No.: 10160655

QC Batch: MT/6195 Analysis Method: EPA 300.0
QC Batch Method: EPA 300.0 Analysis Description: 300.0 IC Anions
Associated Lab Samples: 10160655001, 10160655002, 10160655003, 10160655004, 10160655005, 10160655006, 10160655008, 10160655009, 10160655010, 10160655011

METHOD BLANK: 998638 Matrix: Water
Associated Lab Samples: 10160655001, 10160655002, 10160655003, 10160655004, 10160655005, 10160655006, 10160655008, 10160655009, 10160655010, 10160655011

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Sulfate	mg/L	<1.0	1.0	06/23/11 22:15	

LABORATORY CONTROL SAMPLE: 998639

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Sulfate	mg/L	20	19.5	98	90-110	

MATRIX SPIKE SAMPLE: 998640

Parameter	Units	10160067001 Result	Spike Conc.	MS Result	MS % Rec	% Rec Limits	Qualifiers
Sulfate	mg/L	12.5	20	32.2	99	80-120	

MATRIX SPIKE SAMPLE: 998642

Parameter	Units	10160709001 Result	Spike Conc.	MS Result	MS % Rec	% Rec Limits	Qualifiers
Sulfate	mg/L	4110	4000	8170	101	80-120	

SAMPLE DUPLICATE: 998641

Parameter	Units	10160067002 Result	Dup Result	RPD	Max RPD	Qualifiers
Sulfate	mg/L	14.1	18.4	26	20	D6

SAMPLE DUPLICATE: 998643

Parameter	Units	10160709002 Result	Dup Result	RPD	Max RPD	Qualifiers
Sulfate	mg/L	5330	5370	.6	20	

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QUALITY CONTROL DATA

Project: Black Pine Mine
Pace Project No.: 10160655

QC Batch: WET/22674 Analysis Method: SM 2320B
QC Batch Method: SM 2320B Analysis Description: 2320B Alkalinity
Associated Lab Samples: 10160655001, 10160655002, 10160655003, 10160655004, 10160655005, 10160655006, 10160655008, 10160655009, 10160655010, 10160655011

METHOD BLANK: 998338 Matrix: Water
Associated Lab Samples: 10160655001, 10160655002, 10160655003, 10160655004, 10160655005, 10160655006, 10160655008, 10160655009, 10160655010, 10160655011

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Alkalinity, Total as CaCO3	mg/L	<5.0	5.0	06/20/11 11:16	

LABORATORY CONTROL SAMPLE & LCSD: 998339 998340

Parameter	Units	Spike Conc.	LCS Result	LCSD Result	LCS % Rec	LCSD % Rec	% Rec Limits	RPD	Max RPD	Qualifiers
Alkalinity, Total as CaCO3	mg/L	40	39.0	39.7	98	99	90-110	2	30	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 998341 998342

Parameter	Units	10160707001 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Alkalinity, Total as CaCO3	mg/L	13.4	40	40	53.2	53.8	99	101	80-120	1	30	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 998343 998344

Parameter	Units	10160722002 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Alkalinity, Total as CaCO3	mg/L	232	40	40	281	283	124	127	80-120	.4	30	M1

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QUALITY CONTROL DATA

Project: Black Pine Mine
Pace Project No.: 10160655

QC Batch: WET/22678 Analysis Method: SM 2540C
QC Batch Method: SM 2540C Analysis Description: 2540C Total Dissolved Solids
Associated Lab Samples: 10160655001, 10160655002, 10160655003, 10160655004

METHOD BLANK: 998440 Matrix: Water
Associated Lab Samples: 10160655001, 10160655002, 10160655003, 10160655004

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Total Dissolved Solids	mg/L	<10.0	10.0	06/20/11 12:01	

LABORATORY CONTROL SAMPLE: 998441

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Total Dissolved Solids	mg/L	1000	982	98	80-120	

SAMPLE DUPLICATE: 998442

Parameter	Units	10160707001 Result	Dup Result	RPD	Max RPD	Qualifiers
Total Dissolved Solids	mg/L	125	115	8	20	

SAMPLE DUPLICATE: 998443

Parameter	Units	10160655002 Result	Dup Result	RPD	Max RPD	Qualifiers
Total Dissolved Solids	mg/L	103	94.0	9	20	

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QUALITY CONTROL DATA

Project: Black Pine Mine
Pace Project No.: 10160655

QC Batch: WET/22692 Analysis Method: SM 2540C
QC Batch Method: SM 2540C Analysis Description: 2540C Total Dissolved Solids
Associated Lab Samples: 10160655005, 10160655006, 10160655008, 10160655009, 10160655010, 10160655011

METHOD BLANK: 999964 Matrix: Water
Associated Lab Samples: 10160655005, 10160655006, 10160655008, 10160655009, 10160655010, 10160655011

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Total Dissolved Solids	mg/L	<10.0	10.0	06/22/11 11:26	

LABORATORY CONTROL SAMPLE: 999965

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Total Dissolved Solids	mg/L	1000	998	100	80-120	

SAMPLE DUPLICATE: 999966

Parameter	Units	10160655005 Result	Dup Result	RPD	Max RPD	Qualifiers
Total Dissolved Solids	mg/L	34.0	29.0	16	20	

SAMPLE DUPLICATE: 999967

Parameter	Units	10160655006 Result	Dup Result	RPD	Max RPD	Qualifiers
Total Dissolved Solids	mg/L	34.0	32.0	6	20	

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QUALIFIERS

Project: Black Pine Mine
Pace Project No.: 10160655

DEFINITIONS

DF - Dilution Factor, if reported, represents the factor applied to the reported data due to changes in sample preparation, dilution of the sample aliquot, or moisture content.

ND - Not Detected at or above adjusted reporting limit.

J - Estimated concentration above the adjusted method detection limit and below the adjusted reporting limit.

MDL - Adjusted Method Detection Limit.

S - Surrogate

1,2-Diphenylhydrazine (8270 listed analyte) decomposes to Azobenzene.

Consistent with EPA guidelines, unrounded data are displayed and have been used to calculate % recovery and RPD values.

LCS(D) - Laboratory Control Sample (Duplicate)

MS(D) - Matrix Spike (Duplicate)

DUP - Sample Duplicate

RPD - Relative Percent Difference

NC - Not Calculable.

SG - Silica Gel - Clean-Up

U - Indicates the compound was analyzed for, but not detected.

N-Nitrosodiphenylamine decomposes and cannot be separated from Diphenylamine using Method 8270. The result reported for each analyte is a combined concentration.

LABORATORIES

PASI-M	Pace Analytical Services - Minneapolis
PASI-MT	Pace Analytical Services - Montana

ANALYTE QUALIFIERS

D6	The relative percent difference (RPD) between the sample and sample duplicate exceeded laboratory control limits.
M1	Matrix spike recovery exceeded QC limits. Batch accepted based on laboratory control sample (LCS) recovery.

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QUALITY CONTROL DATA CROSS REFERENCE TABLE

Project: Black Pine Mine
Pace Project No.: 10160655

Lab ID	Sample ID	QC Batch Method	QC Batch	Analytical Method	Analytical Batch
10160655001	**CML-SW-07**	EPA 200.8	MPRP/26726	EPA 200.8	ICPM/10928
10160655002	**CML-SW-03**	EPA 200.8	MPRP/26726	EPA 200.8	ICPM/10928
10160655003	**CML-SW-08**	EPA 200.8	MPRP/26726	EPA 200.8	ICPM/10928
10160655004	**CML-SW-10**	EPA 200.8	MPRP/26726	EPA 200.8	ICPM/10928
10160655005	**CML-SW-16**	EPA 200.8	MPRP/26726	EPA 200.8	ICPM/10928
10160655006	**CML-SW-15**	EPA 200.8	MPRP/26726	EPA 200.8	ICPM/10928
10160655007	**CML-Q1-T1**	EPA 200.8	MPRP/26726	EPA 200.8	ICPM/10928
10160655008	**CML-SW-04**	EPA 200.8	MPRP/26726	EPA 200.8	ICPM/10928
10160655009	**CML-SW-13**	EPA 200.8	MPRP/26726	EPA 200.8	ICPM/10928
10160655010	**CML-SW-05**	EPA 200.8	MPRP/26726	EPA 200.8	ICPM/10928
10160655011	**CML-SW-11**	EPA 200.8	MPRP/26726	EPA 200.8	ICPM/10928
10160655001	**CML-SW-07**	SM 2310	MT/6228		
10160655002	**CML-SW-03**	SM 2310	MT/6228		
10160655003	**CML-SW-08**	SM 2310	MT/6228		
10160655004	**CML-SW-10**	SM 2310	MT/6228		
10160655005	**CML-SW-16**	SM 2310	MT/6228		
10160655006	**CML-SW-15**	SM 2310	MT/6228		
10160655008	**CML-SW-04**	SM 2310	MT/6228		
10160655009	**CML-SW-13**	SM 2310	MT/6228		
10160655010	**CML-SW-05**	SM 2310	MT/6228		
10160655011	**CML-SW-11**	SM 2310	MT/6228		
10160655001	**CML-SW-07**	SM 2540D	MT/6192		
10160655002	**CML-SW-03**	SM 2540D	MT/6192		
10160655003	**CML-SW-08**	SM 2540D	MT/6192		
10160655004	**CML-SW-10**	SM 2540D	MT/6192		
10160655005	**CML-SW-16**	SM 2540D	MT/6192		
10160655006	**CML-SW-15**	SM 2540D	MT/6192		
10160655008	**CML-SW-04**	SM 2540D	MT/6192		
10160655009	**CML-SW-13**	SM 2540D	MT/6192		
10160655010	**CML-SW-05**	SM 2540D	MT/6192		
10160655011	**CML-SW-11**	SM 2540D	MT/6192		
10160655001	**CML-SW-07**	EPA 300.0	MT/6195		
10160655002	**CML-SW-03**	EPA 300.0	MT/6195		
10160655003	**CML-SW-08**	EPA 300.0	MT/6195		
10160655004	**CML-SW-10**	EPA 300.0	MT/6195		
10160655005	**CML-SW-16**	EPA 300.0	MT/6195		
10160655006	**CML-SW-15**	EPA 300.0	MT/6195		
10160655008	**CML-SW-04**	EPA 300.0	MT/6195		
10160655009	**CML-SW-13**	EPA 300.0	MT/6195		
10160655010	**CML-SW-05**	EPA 300.0	MT/6195		
10160655011	**CML-SW-11**	EPA 300.0	MT/6195		
10160655001	**CML-SW-07**	SM 2320B	WET/22674		
10160655002	**CML-SW-03**	SM 2320B	WET/22674		
10160655003	**CML-SW-08**	SM 2320B	WET/22674		
10160655004	**CML-SW-10**	SM 2320B	WET/22674		
10160655005	**CML-SW-16**	SM 2320B	WET/22674		
10160655006	**CML-SW-15**	SM 2320B	WET/22674		

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QUALITY CONTROL DATA CROSS REFERENCE TABLE

Project: Black Pine Mine
Pace Project No.: 10160655

Lab ID	Sample ID	QC Batch Method	QC Batch	Analytical Method	Analytical Batch
10160655008	**CML-SW-04**	SM 2320B	WET/22674		
10160655009	**CML-SW-13**	SM 2320B	WET/22674		
10160655010	**CML-SW-05**	SM 2320B	WET/22674		
10160655011	**CML-SW-11**	SM 2320B	WET/22674		
10160655001	**CML-SW-07**	SM 2540C	WET/22678		
10160655002	**CML-SW-03**	SM 2540C	WET/22678		
10160655003	**CML-SW-08**	SM 2540C	WET/22678		
10160655004	**CML-SW-10**	SM 2540C	WET/22678		
10160655005	**CML-SW-16**	SM 2540C	WET/22692		
10160655006	**CML-SW-15**	SM 2540C	WET/22692		
10160655008	**CML-SW-04**	SM 2540C	WET/22692		
10160655009	**CML-SW-13**	SM 2540C	WET/22692		
10160655010	**CML-SW-05**	SM 2540C	WET/22692		
10160655011	**CML-SW-11**	SM 2540C	WET/22692		

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CHAIN-OF-CUSTODY / Analytical Request Document

The Chain-of-Custody is a LEGAL DOCUMENT. All relevant fields must be completed accurately.

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Section A Required Client Information:	Section B Required Project Information:	Section C Invoice Information:
Company: Herrera	Report To: Kevin Houck	Attention:
Address:	Copy To:	Company Name: DEQ
		Address:
Email To:	Purchase Order No.:	Pace Quote Reference:
Phone: Fax:	Project Name:	Pace Project Manager:
Requested Due Date/TAT:	Project Number:	Pace Profile #:

REGULATORY AGENCY

☐ NPDES ☐ GROUND WATER ☐ DRINKING WATER

☐ UST ☐ RCRA ☐ OTHER _____

Site Location STATE: _____

Requested Analysis Filtered (Y/N)

ITEM #	Section D Required Client Information — SAMPLE ID (A-Z, 0-9 / ,-) Sample IDs MUST BE UNIQUE	Matrix Codes MATRIX / CODE: Drinking Water DW; Water WT; Waste Water WW; Product P; Soil/Solid SL; Oil OL; Wipe WP; Air AR; Tissue TS; Other OT	MATRIX CODE (see valid codes to left)	SAMPLE TYPE (G=GRAB C=COMP)	COLLECTED: COMPOSITE START DATE	COMPOSITE START TIME	COMPOSITE END/GRAB DATE	COMPOSITE END/GRAB TIME	SAMPLE TEMP AT COLLECTION	# OF CONTAINERS	Preservatives: Unpreserved	H_2SO_4	HNO_3	HCl	NaOH	$Na_2S_2O_3$	Methanol	Other	Analysis Test ↓ Y/N	TSS	TDS	Alk	Acidity	Sulfate	Total Metals	Metals (solid)	Residual Chlorine (Y/N)	Pace Project No./ Lab I.D.
																				Y/N	N	N				Y	N		
1	CML-SW-07		WW	G			6/14/11	1005		4	X		X								X	X		X		X			001
2	CML-SW-03						6/15/11	0820		4	X		X								X	X		X		X			002
3	CML-SW-08						6/15/11	1520		4	X		X								X	X		X		X			003
4	CML-SW-10							1451		4	X		X								X	X		X		X			004
5	CML-SW-16							1409		4	X		X								X	X		X		X			005
6																													
7																													
8																													
9																													
10																													
11																													
12																													

ADDITIONAL COMMENTS	RELINQUISHED BY / AFFILIATION	DATE	TIME	ACCEPTED BY / AFFILIATION	DATE	TIME	SAMPLE CONDITIONS: Temp in °C	Received on Ice (Y/N)	Custody Sealed Cooler (Y/N)	Samples Intact (Y/N)
ALL "SML" on bottles should be "CML".	GJ Catena / Herrera	6/16/11	1130				24	5	5	5
	FedEx	6/17/11	0850	Dennis Price	6/17/11	0850				

ORIGINAL

SAMPLER NAME AND SIGNATURE

PRINT Name of SAMPLER: Gina Catena

SIGNATURE of SAMPLER: GJ Catena DATE Signed (MM/DD/YY): 6/16/11

*Important Note: By signing this form you are accepting Pace's NET 30 day payment terms and agreeing to late charges of 1.5% per month for any invoices not paid within 30 days.

F-ALL-Q-020rev.07, 15-May-2007

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Page: 1 of 1

1321622

Section A Required Client Information:	Section B Required Project Information:	Section C Invoice Information:
Company: Herrera	Report To: Kevin Houck	Attention:
Address:	Copy To: "	Company Name: DEQ
		Address:
Email To:	Purchase Order No.:	Pace Quote Reference:
Phone: Fax:	Project Name:	Pace Project Manager:
Requested Due Date/TAT:	Project Number:	Pace Profile #:

REGULATORY AGENCY

☐ NPDES ☐ GROUND WATER ☐ DRINKING WATER

☐ UST ☐ RCRA ☐ OTHER _____

Site Location STATE: _____

Section D Required Client Information

SAMPLE ID
(A-Z, 0-9 / ,-)
Sample IDs MUST BE UNIQUE

Matrix Codes (MATRIX / CODE): Drinking Water DW; Water WT; Waste Water WW; Product P; Soil/Solid SL; Oil OL; Wipe WP; Air AR; Tissue TS; Other OT

Requested Analysis Filtered (Y/N)

ITEM #	SAMPLE ID	MATRIX CODE (see valid codes to left)	SAMPLE TYPE (G=GRAB C=COMP)	COLLECTED COMPOSITE START DATE	COLLECTED COMPOSITE START TIME	COLLECTED COMPOSITE END/GRAB DATE	COLLECTED COMPOSITE END/GRAB TIME	SAMPLE TEMP AT COLLECTION	# OF CONTAINERS	Preservatives: Unpreserved	H_2SO_4	HNO_3	HCl	NaOH	$Na_2S_2O_3$	Methanol	Other	Analysis Test Y/N: TSS	TDS	Alk	Acidity	Total Metals	Metals (solid)	Residual Chlorine (Y/N)	Pace Project No./ Lab I.D.
1	CML-SW-15	W	G			6/15/11	1335		4	X		X						X	X	X	X				1016655 006
2	CML-Q1-T1						1399		1			X									X					007
3	CML-SW-04						1320		4	X		X						X	X	X	X					008
4	CML-SW-13						1239		4	X		X						X	X	X	X					009
5	CML-SW-05						1235		4	X		X						X	X	X	X					010
6	CML-SW-11						1416		4	X		X						X	X	X	X					011
7																										
8																										
9																										
10																										
11																										
12																										

ADDITIONAL COMMENTS	RELINQUISHED BY / AFFILIATION	DATE	TIME	ACCEPTED BY / AFFILIATION	DATE	TIME	SAMPLE CONDITIONS			
All "SML" on bottles should be "CML"	KD Cate / Herrera	6/16/11	1130				40	y	y	y
	Fed Ex	6/17/11	0850	Jennifer Pace	6/17/11	0850				

ORIGINAL

SAMPLER NAME AND SIGNATURE

PRINT Name of SAMPLER: Gina Catarra

SIGNATURE of SAMPLER: KD Cate DATE Signed (MM/DD/YY): 6/16/11

Temp in °C	Received on Ice (Y/N)	Custody Sealed Cooler (Y/N)	Samples Intact (Y/N)

*Important Note: By signing this form you are accepting Pace's NET 30 day payment terms and agreeing to late charges of 1.5% per month for any invoices not paid within 30 days.

Sample Condition Upon Receipt

Pace Analytical

Client Name: Herren Env Project # 10160655

Courier: ☒ Fed Ex ☐ UPS ☐ USPS ☐ Client ☐ Commercial ☐ Pace Other _____

Tracking #: 879718460097295

[redacted]

Custody Seal on Cooler/Box Present: ☑ yes ☐ no Seals intact: ☑ yes ☐ no

Packing Material: ☐ Bubble Wrap ☐ Bubble Bags ☑ None ☐ Other _____ Temp Blank: Yes ✓ No _____

Thermometer Used 1383045 or 135 **Type of Ice:** (Wet) Blue None ☐ Samples on ice, cooling process has begun

Cooler Temperature 4.0 2.4 **Biological Tissue is Frozen:** Yes No

Temp should be above freezing to 6°C

Date and Initials of person examining contents: 6/18/11 M

Comments:

Chain of Custody Present:	☑Yes ☐No ☐N/A	1.
Chain of Custody Filled Out:	☑Yes ☐No ☐N/A	2.
Chain of Custody Relinquished:	☑Yes ☐No ☐N/A	3.
Sampler Name & Signature on COC:	☑Yes ☐No ☐N/A	4.
Samples Arrived within Hold Time:	☑Yes ☐No ☐N/A	5.
Short Hold Time Analysis (<72hr):	☐Yes ☑No ☐N/A	6.
Rush Turn Around Time Requested:	☐Yes ☑No ☐N/A	7.
Sufficient Volume:	☑Yes ☐No ☐N/A	8.
Correct Containers Used:	☑Yes ☐No ☐N/A	9.
-Pace Containers Used:	☑Yes ☐No ☐N/A	
Containers Intact:	☑Yes ☐No ☐N/A	10.
Filtered volume received for Dissolved tests	☐Yes ☐No ☑N/A	11.
Sample Labels match COC:	☑Yes ☐No ☐N/A	12.
-Includes date/time/ID/Analysis Matrix: WW		
All containers needing acid/base preservation have been checked. Noncompliance are noted in 13.	☑Yes ☐No ☐N/A	13. ☑ HNO3 ☐ H2SO4 ☐ NaOH ☐ HCl
All containers needing preservation are found to be in compliance with EPA recommendation.	☑Yes ☐No ☐N/A	Samp # 6of6 11of11 MB 6/17/11
Exceptions: VOA,Coliform, TOC, Oil and Grease, WI-DRO (water)	☐Yes ☑No	Initial when completed / Lot # of added preservative
Samples checked for dechlorination:	☐Yes ☐No ☑N/A	14.
Headspace in VOA Vials (>6mm):	☐Yes ☐No ☑N/A	15.
Trip Blank Present:	☐Yes ☐No ☑N/A	16.
Trip Blank Custody Seals Present	☐Yes ☐No ☑N/A	
Pace Trip Blank Lot # (if purchased):		

Client Notification/ Resolution: Field Data Required? Y / N

Person Contacted: _____ Date/Time: _____

Comments/ Resolution: _____

Project Manager Review: _____ **Date:** 6-20-11

Note: Whenever there is a discrepancy affecting North Carolina compliance samples, a copy of this form will be sent to the North Carolina DEHNR Certification Office (i.e out of hold, incorrect preservative, out of temp, incorrect containers)

Pace Analytical Services, Inc.
602 S 25th Street
Billings, MT 591014549
(406)254-7226

July 01, 2011

Kevin Houck
Herrera Environmental Consultants
101 East Broadway, Suite 610
Missoula, MT 59802

RE: Project: Black Pine Mine
Pace Project No.: 10160673

Dear Kevin Houck:
Enclosed are the analytical results for sample(s) received by the laboratory on June 17, 2011. The results relate only to the samples included in this report.

If you have any questions concerning this report, please feel free to contact me.

Sincerely,

Denise Jensen

denise.jensen@pacelabs.com
Project Manager

Enclosures

cc: Devin Clary, Montana Dept. of Environmental Quality
Mark Donner, Trihydro

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CERTIFICATIONS

Project: Black Pine Mine
Pace Project No.: 10160673

Minnesota Certification IDs

1700 Elm Street SE Suite 200, Minneapolis, MN 55414
A2LA Certification #: 2926.01
Alaska Certification #: UST-078
Alaska Certification #MN00064
Arizona Certification #: AZ-0014
Arkansas Certification #: 88-0680
California Certification #: 01155CA
EPA Region 8 Certification #: Pace
Florida/NELAP Certification #: E87605
Georgia Certification #: 959
Idaho Certification #: MN00064
Illinois Certification #: 200011
Iowa Certification #: 368
Kansas Certification #: E-10167
Louisiana Certification #: 03086
Louisiana Certification #: LA080009
Maine Certification #: 2007029
Maryland Certification #: 322
Michigan DEQ Certification #: 9909
Minnesota Certification #: 027-053-137
Mississippi Certification #: Pace
Montana Certification #: MT CERT0092
Nebraska Certification #: Pace
Nevada Certification #: MN_00064
New Jersey Certification #: MN-002
New Mexico Certification #: Pace
New York Certification #: 11647
North Carolina Certification #: 530
North Dakota Certification #: R-036
North Dakota Certification #: R-036A
Ohio VAP Certification #: CL101
Oklahoma Certification #: D9921
Oklahoma Certification #: 9507
Oregon Certification #: MN200001
Pennsylvania Certification #: 68-00563
Puerto Rico Certification
Tennessee Certification #: 02818
Texas Certification #: T104704192
Washington Certification #: C754
Wisconsin Certification #: 999407970

Montana Certification IDs

602 South 25th Street, Billings, MT 59101
EPA Region 8 Certification #: 8TMS-Q
Idaho Certification #: MT00012
Montana Certification #: MT CERT0040
NVLAP Certification #: 101292-0
Minnesota Dept of Health Certification #: 030-999-442

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SAMPLE SUMMARY

Project: Black Pine Mine
Pace Project No.: 10160673

Lab ID	Sample ID	Matrix	Date Collected	Date Received
10160673001	**BP-CML-SD-04-00**	Solid	06/14/11 16:30	06/17/11 08:50
10160673002	**BP-CML-SD-05-00**	Solid	06/14/11 14:25	06/17/11 08:50
10160673003	**BP-CML-SD-03-00**	Solid	06/14/11 13:55	06/17/11 08:50
10160673004	**TSP-6**	Water	06/14/11 13:50	06/17/11 08:50
10160673005	**CML-SW-17**	Water	06/14/11 17:45	06/17/11 08:50
10160673006	**CML-SW-18**	Water	06/14/11 14:20	06/17/11 08:50
10160673007	**CML-SD-09**	Solid	06/14/11 15:00	06/17/11 08:50
10160673008	**CML-SD-10**	Solid	06/14/11 16:45	06/17/11 08:50
10160673009	**CML-SD-07**	Solid	06/14/11 10:10	06/17/11 08:50
10160673010	**CML-SD-08**	Solid	06/14/11 15:15	06/17/11 08:50
10160673011	**CML-SD-11**	Solid	06/14/11 18:00	06/17/11 08:50
10160673012	**CML-SD-01**	Solid	06/14/11 13:23	06/17/11 08:50
10160673013	**CML-SD-02**	Solid	06/15/11 09:20	06/17/11 08:50
10160673014	**BP-CML-SD-03-00**	Solid	06/15/11 08:25	06/17/11 08:50

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SAMPLE ANALYTE COUNT

Project: Black Pine Mine
Pace Project No.: 10160673

Lab ID	Sample ID	Method	Analysts	Analytes Reported	Laboratory
10160673001	**BP-CML-SD-04-00**	EPA 6020	CJS, RJS	12	PASI-M
		EPA 7471	TEM	1	PASI-M
		% Moisture	JDL	1	PASI-M
10160673002	**BP-CML-SD-05-00**	EPA 6020	CJS, RJS	12	PASI-M
		EPA 7471	TEM	1	PASI-M
		% Moisture	JDL	1	PASI-M
10160673003	**BP-CML-SD-03-00**	EPA 6020	CJS, RJS	12	PASI-M
		EPA 7471	TEM	1	PASI-M
		% Moisture	JDL	1	PASI-M
10160673004	**TSP-6**	EPA 200.8	CJS, TL1	12	PASI-M
		SM 2310	CAC	1	PASI-MT
		SM 2540D	SR1	1	PASI-MT
		EPA 300.0	JH1	1	PASI-MT
		SM 2320B	MWD	1	PASI-M
		SM 2540C	PH1	1	PASI-M
10160673005	**CML-SW-17**	EPA 200.8	CJS, TL1	12	PASI-M
		SM 2310	CAC	1	PASI-MT
		SM 2540D	SR1	1	PASI-MT
		EPA 300.0	JH1	1	PASI-MT
		SM 2320B	MWD	1	PASI-M
		SM 2540C	PH1	1	PASI-M
10160673006	**CML-SW-18**	EPA 200.8	CJS, TL1	12	PASI-M
		SM 2310	CAC	1	PASI-MT
		SM 2540D	SR1	1	PASI-MT
		EPA 300.0	JH1	1	PASI-MT
		SM 2320B	MWD	1	PASI-M
		SM 2540C	PH1	1	PASI-M
10160673007	**CML-SD-09**	EPA 6020	CJS, RJS	12	PASI-M
		EPA 7471	TEM	1	PASI-M
		% Moisture	JDL	1	PASI-M
10160673008	**CML-SD-10**	EPA 6020	CJS, RJS	12	PASI-M
		EPA 7471	TEM	1	PASI-M
		% Moisture	JDL	1	PASI-M
10160673009	**CML-SD-07**	EPA 6020	CJS, RJS	12	PASI-M
		EPA 7471	TEM	1	PASI-M
		% Moisture	JDL	1	PASI-M
10160673010	**CML-SD-08**	EPA 6020	CJS, RJS	12	PASI-M

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SAMPLE ANALYTE COUNT

Project: Black Pine Mine
Pace Project No.: 10160673

Lab ID	Sample ID	Method	Analysts	Analytes Reported	Laboratory
		EPA 7471	TEM	1	PASI-M
		% Moisture	JDL	1	PASI-M
10160673011	**CML-SD-11**	EPA 6020	CJS, RJS	12	PASI-M
		EPA 7471	TEM	1	PASI-M
		% Moisture	JDL	1	PASI-M
10160673012	**CML-SD-01**	EPA 6020	CJS, RJS	12	PASI-M
		EPA 7471	TEM	1	PASI-M
		% Moisture	JDL	1	PASI-M
10160673013	**CML-SD-02**	EPA 6020	CJS, RJS	12	PASI-M
		EPA 7471	TEM	1	PASI-M
		% Moisture	JDL	1	PASI-M
10160673014	**BP-CML-SD-03-00**	EPA 6020	CJS, RJS	12	PASI-M
		EPA 7471	TEM	1	PASI-M
		% Moisture	JDL	1	PASI-M

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PROJECT NARRATIVE

Project: Black Pine Mine
Pace Project No.: 10160673

Method: **EPA 200.8**
Description: 200.8 MET ICPMS
Client: Montana Dept. of Environmental Quality
Date: July 01, 2011

General Information:
3 samples were analyzed for EPA 200.8. All samples were received in acceptable condition with any exceptions noted below.

Hold Time:
The samples were analyzed within the method required hold times with any exceptions noted below.

Sample Preparation:
The samples were prepared in accordance with EPA 200.8 with any exceptions noted below.

Initial Calibrations (including MS Tune as applicable):
All criteria were within method requirements with any exceptions noted below.

Continuing Calibration:
All criteria were within method requirements with any exceptions noted below.

Internal Standards:
All internal standards were within QC limits with any exceptions noted below.

Method Blank:
All analytes were below the report limit in the method blank with any exceptions noted below.

Laboratory Control Spike:
All laboratory control spike compounds were within QC limits with any exceptions noted below.

Matrix Spikes:
All percent recoveries and relative percent differences (RPDs) were within acceptance criteria with any exceptions noted below.

QC Batch: MPRP/26726

A matrix spike and matrix spike duplicate (MS/MSD) were performed on the following sample(s): 10160655001,10160673004

M1: Matrix spike recovery exceeded QC limits. Batch accepted based on laboratory control sample (LCS) recovery.

- MS (Lab ID: 998292)
  - Iron
- MS (Lab ID: 998294)
  - Iron
- MSD (Lab ID: 998293)
  - Iron

Duplicate Sample:
All duplicate sample results were within method acceptance criteria with any exceptions noted below.

Additional Comments:

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PROJECT NARRATIVE

Project: Black Pine Mine
Pace Project No.: 10160673

Method: **EPA 6020**
Description: 6020 MET ICPMS
Client: Montana Dept. of Environmental Quality
Date: July 01, 2011

General Information:
11 samples were analyzed for EPA 6020. All samples were received in acceptable condition with any exceptions noted below.

Hold Time:
The samples were analyzed within the method required hold times with any exceptions noted below.

Sample Preparation:
The samples were prepared in accordance with EPA 3050 with any exceptions noted below.

Initial Calibrations (including MS Tune as applicable):
All criteria were within method requirements with any exceptions noted below.

Continuing Calibration:
All criteria were within method requirements with any exceptions noted below.

Internal Standards:
All internal standards were within QC limits with any exceptions noted below.

Method Blank:
All analytes were below the report limit in the method blank with any exceptions noted below.

Laboratory Control Spike:
All laboratory control spike compounds were within QC limits with any exceptions noted below.

Matrix Spikes:
All percent recoveries and relative percent differences (RPDs) were within acceptance criteria with any exceptions noted below.

QC Batch: MPRP/26729

A matrix spike and matrix spike duplicate (MS/MSD) were performed on the following sample(s): 10160673001,10160673014

M6: Matrix spike and Matrix spike duplicate recovery not evaluated against control limits due to sample dilution.

- MS (Lab ID: 998306)
  - Barium
  - Copper
  - Iron
  - Lead
  - Manganese
  - Zinc
- MS (Lab ID: 998308)
  - Antimony
  - Barium
  - Chromium
  - Iron
  - Lead
  - Manganese

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PROJECT NARRATIVE

Project: Black Pine Mine
Pace Project No.: 10160673

Method: **EPA 6020**
Description: 6020 MET ICPMS
Client: Montana Dept. of Environmental Quality
Date: July 01, 2011

QC Batch: MPRP/26729

A matrix spike and matrix spike duplicate (MS/MSD) were performed on the following sample(s): 10160673001,10160673014

M6: Matrix spike and Matrix spike duplicate recovery not evaluated against control limits due to sample dilution.

- Zinc

- MSD (Lab ID: 998307)
  - Barium
  - Iron
  - Lead
  - Manganese
  - Zinc

Duplicate Sample:
All duplicate sample results were within method acceptance criteria with any exceptions noted below.

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PROJECT NARRATIVE

Project: Black Pine Mine
Pace Project No.: 10160673

Method: **EPA 7471**
Description: 7471 Mercury
Client: Montana Dept. of Environmental Quality
Date: July 01, 2011

General Information:
11 samples were analyzed for EPA 7471. All samples were received in acceptable condition with any exceptions noted below.

Hold Time:
The samples were analyzed within the method required hold times with any exceptions noted below.

Sample Preparation:
The samples were prepared in accordance with EPA 7471 with any exceptions noted below.

Initial Calibrations (including MS Tune as applicable):
All criteria were within method requirements with any exceptions noted below.

Continuing Calibration:
All criteria were within method requirements with any exceptions noted below.

Method Blank:
All analytes were below the report limit in the method blank with any exceptions noted below.

Laboratory Control Spike:
All laboratory control spike compounds were within QC limits with any exceptions noted below.

Matrix Spikes:
All percent recoveries and relative percent differences (RPDs) were within acceptance criteria with any exceptions noted below.

QC Batch: MERP/5542

A matrix spike and matrix spike duplicate (MS/MSD) were performed on the following sample(s): 10160673001,10160707009

M6: Matrix spike and Matrix spike duplicate recovery not evaluated against control limits due to sample dilution.

- MS (Lab ID: 999062)
  - Mercury
- MS (Lab ID: 999064)
  - Mercury
- MSD (Lab ID: 999063)
  - Mercury

Duplicate Sample:
All duplicate sample results were within method acceptance criteria with any exceptions noted below.

Additional Comments:

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PROJECT NARRATIVE

Project: Black Pine Mine
Pace Project No.: 10160673

Method: **SM 2310**
Description: 2310 Acidity
Client: Montana Dept. of Environmental Quality
Date: July 01, 2011

General Information:
3 samples were analyzed for SM 2310. All samples were received in acceptable condition with any exceptions noted below.

Hold Time:
The samples were analyzed within the method required hold times with any exceptions noted below.

Initial Calibrations (including MS Tune as applicable):
All criteria were within method requirements with any exceptions noted below.

Continuing Calibration:
All criteria were within method requirements with any exceptions noted below.

Internal Standards:
All internal standards were within QC limits with any exceptions noted below.

Surrogates:
All surrogates were within QC limits with any exceptions noted below.

Method Blank:
All analytes were below the report limit in the method blank with any exceptions noted below.

Laboratory Control Spike:
All laboratory control spike compounds were within QC limits with any exceptions noted below.

Matrix Spikes:
All percent recoveries and relative percent differences (RPDs) were within acceptance criteria with any exceptions noted below.

Duplicate Sample:
All duplicate sample results were within method acceptance criteria with any exceptions noted below.

Additional Comments:

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PROJECT NARRATIVE

Project: Black Pine Mine
Pace Project No.: 10160673

Method: **SM 2540D**
Description: 2540D Total Suspended Solids
Client: Montana Dept. of Environmental Quality
Date: July 01, 2011

General Information:
3 samples were analyzed for SM 2540D. All samples were received in acceptable condition with any exceptions noted below.

Hold Time:
The samples were analyzed within the method required hold times with any exceptions noted below.

Initial Calibrations (including MS Tune as applicable):
All criteria were within method requirements with any exceptions noted below.

Continuing Calibration:
All criteria were within method requirements with any exceptions noted below.

Internal Standards:
All internal standards were within QC limits with any exceptions noted below.

Surrogates:
All surrogates were within QC limits with any exceptions noted below.

Method Blank:
All analytes were below the report limit in the method blank with any exceptions noted below.

Laboratory Control Spike:
All laboratory control spike compounds were within QC limits with any exceptions noted below.

Matrix Spikes:
All percent recoveries and relative percent differences (RPDs) were within acceptance criteria with any exceptions noted below.

Duplicate Sample:
All duplicate sample results were within method acceptance criteria with any exceptions noted below.

Additional Comments:

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PROJECT NARRATIVE

Project: Black Pine Mine
Pace Project No.: 10160673

Method: **EPA 300.0**
Description: 300.0 IC Anions
Client: Montana Dept. of Environmental Quality
Date: July 01, 2011

General Information:
3 samples were analyzed for EPA 300.0. All samples were received in acceptable condition with any exceptions noted below.

Hold Time:
The samples were analyzed within the method required hold times with any exceptions noted below.

Initial Calibrations (including MS Tune as applicable):
All criteria were within method requirements with any exceptions noted below.

Continuing Calibration:
All criteria were within method requirements with any exceptions noted below.

Internal Standards:
All internal standards were within QC limits with any exceptions noted below.

Surrogates:
All surrogates were within QC limits with any exceptions noted below.

Method Blank:
All analytes were below the report limit in the method blank with any exceptions noted below.

Laboratory Control Spike:
All laboratory control spike compounds were within QC limits with any exceptions noted below.

Matrix Spikes:
All percent recoveries and relative percent differences (RPDs) were within acceptance criteria with any exceptions noted below.

Duplicate Sample:
All duplicate sample results were within method acceptance criteria with any exceptions noted below.

QC Batch: MT/6195

D6: The relative percent difference (RPD) between the sample and sample duplicate exceeded laboratory control limits.

- DUP (Lab ID: 998641)
  - Sulfate

Additional Comments:

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PROJECT NARRATIVE

Project: Black Pine Mine
Pace Project No.: 10160673

Method: **SM 2320B**
Description: 2320B Alkalinity
Client: Montana Dept. of Environmental Quality
Date: July 01, 2011

General Information:
3 samples were analyzed for SM 2320B. All samples were received in acceptable condition with any exceptions noted below.

Hold Time:
The samples were analyzed within the method required hold times with any exceptions noted below.

Method Blank:
All analytes were below the report limit in the method blank with any exceptions noted below.

Laboratory Control Spike:
All laboratory control spike compounds were within QC limits with any exceptions noted below.

Matrix Spikes:
All percent recoveries and relative percent differences (RPDs) were within acceptance criteria with any exceptions noted below.

QC Batch: WET/22674

A matrix spike and matrix spike duplicate (MS/MSD) were performed on the following sample(s): 10160707001,10160722002

M1: Matrix spike recovery exceeded QC limits. Batch accepted based on laboratory control sample (LCS) recovery.

- MS (Lab ID: 998343)
  - Alkalinity, Total as CaCO3
- MSD (Lab ID: 998344)
  - Alkalinity, Total as CaCO3

Duplicate Sample:
All duplicate sample results were within method acceptance criteria with any exceptions noted below.

Additional Comments:

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PROJECT NARRATIVE

Project: Black Pine Mine
Pace Project No.: 10160673

Method: **SM 2540C**
Description: 2540C Total Dissolved Solids
Client: Montana Dept. of Environmental Quality
Date: July 01, 2011

General Information:
3 samples were analyzed for SM 2540C. All samples were received in acceptable condition with any exceptions noted below.

Hold Time:
The samples were analyzed within the method required hold times with any exceptions noted below.

Method Blank:
All analytes were below the report limit in the method blank with any exceptions noted below.

Laboratory Control Spike:
All laboratory control spike compounds were within QC limits with any exceptions noted below.

Matrix Spikes:
All percent recoveries and relative percent differences (RPDs) were within acceptance criteria with any exceptions noted below.

Duplicate Sample:
All duplicate sample results were within method acceptance criteria with any exceptions noted below.

Additional Comments:

This data package has been reviewed for quality and completeness and is approved for release.

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ANALYTICAL RESULTS

Project: Black Pine Mine
Pace Project No.: 10160673

Sample: BP-CML-SD-04-00 **Lab ID: 10160673001** Collected: 06/14/11 16:30 Received: 06/17/11 08:50 Matrix: Solid

Results reported on a "dry-weight" basis

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
6020 MET ICPMS	Analytical Method: EPA 6020 Preparation Method: EPA 3050							
Antimony	**16.7**	mg/kg	1.2	20	06/28/11 17:42	06/29/11 18:08	7440-36-0	
Arsenic	**27.9**	mg/kg	1.2	20	06/28/11 17:42	06/29/11 18:08	7440-38-2	
Barium	**335**	mg/kg	0.74	20	06/28/11 17:42	06/29/11 18:08	7440-39-3	M6
Cadmium	**1.4**	mg/kg	0.20	20	06/28/11 17:42	06/29/11 18:08	7440-43-9	
Chromium	**8.3**	mg/kg	1.2	20	06/28/11 17:42	06/29/11 18:08	7440-47-3	
Copper	**109**	mg/kg	1.2	20	06/28/11 17:42	06/29/11 18:08	7440-50-8	M6
Iron	**12400**	mg/kg	123	20	06/28/11 17:42	06/29/11 18:08	7439-89-6	M6
Lead	**74.2**	mg/kg	1.2	100	06/28/11 17:42	07/01/11 11:32	7439-92-1	M6
Manganese	**1980**	mg/kg	6.1	100	06/28/11 17:42	07/01/11 11:32	7439-96-5	M6
Nickel	**11.4**	mg/kg	1.2	20	06/28/11 17:42	06/29/11 18:08	7440-02-0	
Silver	**2.2**	mg/kg	1.2	20	06/28/11 17:42	06/29/11 18:08	7440-22-4	
Zinc	**144**	mg/kg	12.3	20	06/28/11 17:42	06/29/11 18:08	7440-66-6	M6
7471 Mercury	Analytical Method: EPA 7471 Preparation Method: EPA 7471							
Mercury	**14.4**	mg/kg	1.1	20	06/29/11 16:02	06/30/11 08:56	7439-97-6	M6
Dry Weight	Analytical Method: % Moisture							
Percent Moisture	**67.7**	%	0.10	1		06/27/11 00:00		

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ANALYTICAL RESULTS

Project: Black Pine Mine
Pace Project No.: 10160673

Sample: BP-CML-SD-05-00 **Lab ID: 10160673002** Collected: 06/14/11 14:25 Received: 06/17/11 08:50 Matrix: Solid

Results reported on a "dry-weight" basis

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
6020 MET ICPMS	Analytical Method: EPA 6020 Preparation Method: EPA 3050							
Antimony	**<0.64**	mg/kg	0.64	20	06/28/11 17:42	06/29/11 18:27	7440-36-0	
Arsenic	**12.0**	mg/kg	0.64	20	06/28/11 17:42	06/29/11 18:27	7440-38-2	
Barium	**452**	mg/kg	0.38	20	06/28/11 17:42	06/29/11 18:27	7440-39-3	
Cadmium	**1.2**	mg/kg	0.10	20	06/28/11 17:42	06/29/11 18:27	7440-43-9	
Chromium	**11.8**	mg/kg	0.64	20	06/28/11 17:42	06/29/11 18:27	7440-47-3	
Copper	**26.8**	mg/kg	0.64	20	06/28/11 17:42	06/29/11 18:27	7440-50-8	
Iron	**14500**	mg/kg	63.9	20	06/28/11 17:42	06/29/11 18:27	7439-89-6	
Lead	**16.3**	mg/kg	0.64	100	06/28/11 17:42	07/01/11 11:46	7439-92-1	
Manganese	**1160**	mg/kg	3.2	100	06/28/11 17:42	07/01/11 11:46	7439-96-5	
Nickel	**13.4**	mg/kg	0.64	20	06/28/11 17:42	06/29/11 18:27	7440-02-0	
Silver	**<0.64**	mg/kg	0.64	20	06/28/11 17:42	06/29/11 18:27	7440-22-4	
Zinc	**96.8**	mg/kg	6.4	20	06/28/11 17:42	06/29/11 18:27	7440-66-6	
7471 Mercury	Analytical Method: EPA 7471 Preparation Method: EPA 7471							
Mercury	**0.38**	mg/kg	0.031	1	06/29/11 16:02	06/30/11 10:33	7439-97-6	
Dry Weight	Analytical Method: % Moisture							
Percent Moisture	**43.7**	%	0.10	1		06/27/11 00:00		

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ANALYTICAL RESULTS

Project: Black Pine Mine
Pace Project No.: 10160673

Sample: BP-CML-SD-03-00 **Lab ID: 10160673003** Collected: 06/14/11 13:55 Received: 06/17/11 08:50 Matrix: Solid

Results reported on a "dry-weight" basis

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
6020 MET ICPMS	Analytical Method: EPA 6020 Preparation Method: EPA 3050							
Antimony	**3.3**	mg/kg	1.4	20	06/28/11 17:42	06/29/11 18:31	7440-36-0	
Arsenic	**20.2**	mg/kg	1.4	20	06/28/11 17:42	06/29/11 18:31	7440-38-2	
Barium	**800**	mg/kg	0.86	20	06/28/11 17:42	06/29/11 18:31	7440-39-3	
Cadmium	**1.8**	mg/kg	0.23	20	06/28/11 17:42	06/29/11 18:31	7440-43-9	
Chromium	**23.5**	mg/kg	1.4	20	06/28/11 17:42	06/29/11 18:31	7440-47-3	
Copper	**87.7**	mg/kg	1.4	20	06/28/11 17:42	06/29/11 18:31	7440-50-8	
Iron	**20600**	mg/kg	143	20	06/28/11 17:42	06/29/11 18:31	7439-89-6	
Lead	**39.2**	mg/kg	1.4	100	06/28/11 17:42	07/01/11 11:50	7439-92-1	
Manganese	**1150**	mg/kg	1.4	20	06/28/11 17:42	06/29/11 18:31	7439-96-5	
Nickel	**31.2**	mg/kg	1.4	20	06/28/11 17:42	06/29/11 18:31	7440-02-0	
Silver	**<1.4**	mg/kg	1.4	20	06/28/11 17:42	06/29/11 18:31	7440-22-4	
Zinc	**136**	mg/kg	14.3	20	06/28/11 17:42	06/29/11 18:31	7440-66-6	
7471 Mercury	Analytical Method: EPA 7471 Preparation Method: EPA 7471							
Mercury	**0.76**	mg/kg	0.070	1	06/29/11 16:02	06/30/11 10:35	7439-97-6	
Dry Weight	Analytical Method: % Moisture							
Percent Moisture	**71.6**	%	0.10	1		06/27/11 00:00		

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ANALYTICAL RESULTS

Project: Black Pine Mine
Pace Project No.: 10160673

Sample: TSP-6 **Lab ID: 10160673004** Collected: 06/14/11 13:50 Received: 06/17/11 08:50 Matrix: Water

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
200.8 MET ICPMS	Analytical Method: EPA 200.8 Preparation Method: EPA 200.8							
Antimony	**0.53**	ug/L	0.50	1	06/28/11 15:18	06/30/11 06:59	7440-36-0	
Arsenic	**1.1**	ug/L	0.50	1	06/28/11 15:18	06/30/11 06:59	7440-38-2	
Barium	**85.4**	ug/L	0.30	1	06/28/11 15:18	06/30/11 06:59	7440-39-3	
Cadmium	**<0.080**	ug/L	0.080	1	06/28/11 15:18	06/30/11 06:59	7440-43-9	
Chromium	**1.3**	ug/L	0.50	1	06/28/11 15:18	06/30/11 06:59	7440-47-3	
Copper	**22.5**	ug/L	0.50	1	06/28/11 15:18	06/30/11 06:59	7440-50-8	
Iron	**1000**	ug/L	50.0	1	06/28/11 15:18	06/30/11 06:59	7439-89-6	M1
Lead	**0.97**	ug/L	0.10	1	06/28/11 15:18	06/30/11 06:59	7439-92-1	
Manganese	**8.9**	ug/L	0.50	1	06/28/11 15:18	06/30/11 06:59	7439-96-5	
Nickel	**2.2**	ug/L	0.50	1	06/28/11 15:18	06/30/11 06:59	7440-02-0	
Silver	**<0.50**	ug/L	0.50	1	06/28/11 15:18	06/30/11 14:55	7440-22-4	
Zinc	**8.2**	ug/L	5.0	1	06/28/11 15:18	06/30/11 06:59	7440-66-6	
2310 Acidity	Analytical Method: SM 2310							
Acidity	**12.0**	mg/L	5.0	1		06/24/11 16:00		
2540D Total Suspended Solids	Analytical Method: SM 2540D							
Total Suspended Solids	**2.7**	mg/L	1.0	1		06/20/11 10:40		
300.0 IC Anions	Analytical Method: EPA 300.0							
Sulfate	**4.2**	mg/L	1.0	1		06/24/11 07:45	14808-79-8	
2320B Alkalinity	Analytical Method: SM 2320B							
Alkalinity, Total as CaCO3	**12.1**	mg/L	5.0	1		06/20/11 11:49		
2540C Total Dissolved Solids	Analytical Method: SM 2540C							
Total Dissolved Solids	**101**	mg/L	10.0	1		06/20/11 11:22		

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ANALYTICAL RESULTS

Project: Black Pine Mine
Pace Project No.: 10160673

Sample: CML-SW-17 **Lab ID: 10160673005** Collected: 06/14/11 17:45 Received: 06/17/11 08:50 Matrix: Water

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
200.8 MET ICPMS	Analytical Method: EPA 200.8 Preparation Method: EPA 200.8							
Antimony	**<0.50**	ug/L	0.50	1	06/28/11 15:18	06/30/11 06:37	7440-36-0	
Arsenic	**<0.50**	ug/L	0.50	1	06/28/11 15:18	06/30/11 06:37	7440-38-2	
Barium	**8.7**	ug/L	0.30	1	06/28/11 15:18	06/30/11 06:37	7440-39-3	
Cadmium	**<0.080**	ug/L	0.080	1	06/28/11 15:18	06/30/11 06:37	7440-43-9	
Chromium	**<0.50**	ug/L	0.50	1	06/28/11 15:18	06/30/11 06:37	7440-47-3	
Copper	**2.4**	ug/L	0.50	1	06/28/11 15:18	06/30/11 06:37	7440-50-8	
Iron	**115**	ug/L	50.0	1	06/28/11 15:18	06/30/11 06:37	7439-89-6	
Lead	**0.13**	ug/L	0.10	1	06/28/11 15:18	06/30/11 06:37	7439-92-1	
Manganese	**1.7**	ug/L	0.50	1	06/28/11 15:18	06/30/11 06:37	7439-96-5	
Nickel	**<0.50**	ug/L	0.50	1	06/28/11 15:18	06/30/11 06:37	7440-02-0	
Silver	**<0.50**	ug/L	0.50	1	06/28/11 15:18	06/30/11 14:58	7440-22-4	
Zinc	**12.5**	ug/L	5.0	1	06/28/11 15:18	06/30/11 06:37	7440-66-6	
2310 Acidity	Analytical Method: SM 2310							
Acidity	**15.8**	mg/L	5.0	1		06/24/11 16:00		
2540D Total Suspended Solids	Analytical Method: SM 2540D							
Total Suspended Solids	**<1.0**	mg/L	1.0	1		06/20/11 10:40		
300.0 IC Anions	Analytical Method: EPA 300.0							
Sulfate	**4.4**	mg/L	1.0	1		06/24/11 08:13	14808-79-8	
2320B Alkalinity	Analytical Method: SM 2320B							
Alkalinity, Total as CaCO3	**<5.0**	mg/L	5.0	1		06/20/11 11:53		
2540C Total Dissolved Solids	Analytical Method: SM 2540C							
Total Dissolved Solids	**42.0**	mg/L	10.0	1		06/20/11 11:22		

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ANALYTICAL RESULTS

Project: Black Pine Mine
Pace Project No.: 10160673

Sample: CML-SW-18 **Lab ID: 10160673006** Collected: 06/14/11 14:20 Received: 06/17/11 08:50 Matrix: Water

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
200.8 MET ICPMS	Analytical Method: EPA 200.8 Preparation Method: EPA 200.8							
Antimony	**<0.50**	ug/L	0.50	1	06/28/11 15:18	06/30/11 07:08	7440-36-0	
Arsenic	**<0.50**	ug/L	0.50	1	06/28/11 15:18	06/30/11 07:08	7440-38-2	
Barium	**20.4**	ug/L	0.30	1	06/28/11 15:18	06/30/11 07:08	7440-39-3	
Cadmium	**<0.080**	ug/L	0.080	1	06/28/11 15:18	06/30/11 07:08	7440-43-9	
Chromium	**<0.50**	ug/L	0.50	1	06/28/11 15:18	06/30/11 07:08	7440-47-3	
Copper	**2.0**	ug/L	0.50	1	06/28/11 15:18	06/30/11 07:08	7440-50-8	
Iron	**158**	ug/L	50.0	1	06/28/11 15:18	06/30/11 07:08	7439-89-6	
Lead	**0.27**	ug/L	0.10	1	06/28/11 15:18	06/30/11 07:08	7439-92-1	
Manganese	**1.0**	ug/L	0.50	1	06/28/11 15:18	06/30/11 07:08	7439-96-5	
Nickel	**<0.50**	ug/L	0.50	1	06/28/11 15:18	06/30/11 07:08	7440-02-0	
Silver	**<0.50**	ug/L	0.50	1	06/28/11 15:18	06/30/11 15:01	7440-22-4	
Zinc	**<5.0**	ug/L	5.0	1	06/28/11 15:18	06/30/11 07:08	7440-66-6	
2310 Acidity	Analytical Method: SM 2310							
Acidity	**<5.0**	mg/L	5.0	1		06/24/11 16:00		
2540D Total Suspended Solids	Analytical Method: SM 2540D							
Total Suspended Solids	**<2.0**	mg/L	2.0	1		06/20/11 10:40		
300.0 IC Anions	Analytical Method: EPA 300.0							
Sulfate	**2.7**	mg/L	1.0	1		06/24/11 08:42	14808-79-8	
2320B Alkalinity	Analytical Method: SM 2320B							
Alkalinity, Total as CaCO3	**5.4**	mg/L	5.0	1		06/20/11 12:03		
2540C Total Dissolved Solids	Analytical Method: SM 2540C							
Total Dissolved Solids	**53.0**	mg/L	10.0	1		06/20/11 11:23		

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ANALYTICAL RESULTS

Project: Black Pine Mine
Pace Project No.: 10160673

Sample: CML-SD-09 **Lab ID: 10160673007** Collected: 06/14/11 15:00 Received: 06/17/11 08:50 Matrix: Solid

Results reported on a "dry-weight" basis

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
6020 MET ICPMS	Analytical Method: EPA 6020 Preparation Method: EPA 3050							
Antimony	**465**	mg/kg	0.55	20	06/28/11 17:42	06/29/11 18:36	7440-36-0	
Arsenic	**377**	mg/kg	0.55	20	06/28/11 17:42	06/29/11 18:36	7440-38-2	
Barium	**163**	mg/kg	0.33	20	06/28/11 17:42	06/29/11 18:36	7440-39-3	
Cadmium	**7.8**	mg/kg	0.087	20	06/28/11 17:42	06/29/11 18:36	7440-43-9	
Chromium	**5.4**	mg/kg	0.55	20	06/28/11 17:42	06/29/11 18:36	7440-47-3	
Copper	**920**	mg/kg	5.5	200	06/28/11 17:42	07/01/11 11:54	7440-50-8	
Iron	**15400**	mg/kg	54.5	20	06/28/11 17:42	06/29/11 18:36	7439-89-6	
Lead	**2070**	mg/kg	1.1	200	06/28/11 17:42	07/01/11 11:54	7439-92-1	
Manganese	**452**	mg/kg	0.55	20	06/28/11 17:42	06/29/11 18:36	7439-96-5	
Nickel	**5.2**	mg/kg	0.55	20	06/28/11 17:42	06/29/11 18:36	7440-02-0	
Silver	**23.9**	mg/kg	0.55	20	06/28/11 17:42	06/29/11 18:36	7440-22-4	
Zinc	**287**	mg/kg	5.5	20	06/28/11 17:42	06/29/11 18:36	7440-66-6	
7471 Mercury	Analytical Method: EPA 7471 Preparation Method: EPA 7471							
Mercury	**5.4**	mg/kg	0.54	20	06/29/11 16:02	06/30/11 09:42	7439-97-6	
Dry Weight	Analytical Method: % Moisture							
Percent Moisture	**26.1**	%	0.10	1		06/27/11 00:00		

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ANALYTICAL RESULTS

Project: Black Pine Mine
Pace Project No.: 10160673

Sample: CML-SD-10 **Lab ID: 10160673008** Collected: 06/14/11 16:45 Received: 06/17/11 08:50 Matrix: Solid

Results reported on a "dry-weight" basis

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
6020 MET ICPMS	Analytical Method: EPA 6020 Preparation Method: EPA 3050							
Antimony	**596**	mg/kg	5.8	200	06/28/11 17:42	07/01/11 11:59	7440-36-0	
Arsenic	**492**	mg/kg	0.58	20	06/28/11 17:42	06/29/11 19:03	7440-38-2	
Barium	**185**	mg/kg	0.35	20	06/28/11 17:42	06/29/11 19:03	7440-39-3	
Cadmium	**10.3**	mg/kg	0.092	20	06/28/11 17:42	06/29/11 19:03	7440-43-9	
Chromium	**5.2**	mg/kg	0.58	20	06/28/11 17:42	06/29/11 19:03	7440-47-3	
Copper	**1160**	mg/kg	5.8	200	06/28/11 17:42	07/01/11 11:59	7440-50-8	
Iron	**19700**	mg/kg	57.7	20	06/28/11 17:42	06/29/11 19:03	7439-89-6	
Lead	**2460**	mg/kg	1.2	200	06/28/11 17:42	07/01/11 11:59	7439-92-1	
Manganese	**419**	mg/kg	0.58	20	06/28/11 17:42	06/29/11 19:03	7439-96-5	
Nickel	**4.9**	mg/kg	0.58	20	06/28/11 17:42	06/29/11 19:03	7440-02-0	
Silver	**38.2**	mg/kg	0.58	20	06/28/11 17:42	06/29/11 19:03	7440-22-4	
Zinc	**401**	mg/kg	5.8	20	06/28/11 17:42	06/29/11 19:03	7440-66-6	
7471 Mercury	Analytical Method: EPA 7471 Preparation Method: EPA 7471							
Mercury	**7.0**	mg/kg	0.52	20	06/29/11 16:02	06/30/11 09:44	7439-97-6	
Dry Weight	Analytical Method: % Moisture							
Percent Moisture	**30.1**	%	0.10	1		06/27/11 00:00		

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ANALYTICAL RESULTS

Project: Black Pine Mine
Pace Project No.: 10160673

Sample: CML-SD-07 **Lab ID: 10160673009** Collected: 06/14/11 10:10 Received: 06/17/11 08:50 Matrix: Solid

Results reported on a "dry-weight" basis

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
6020 MET ICPMS	Analytical Method: EPA 6020 Preparation Method: EPA 3050							
Antimony	**817**	mg/kg	7.6	200	06/28/11 17:42	07/01/11 12:03	7440-36-0	
Arsenic	**596**	mg/kg	0.76	20	06/28/11 17:42	06/29/11 19:08	7440-38-2	
Barium	**340**	mg/kg	0.45	20	06/28/11 17:42	06/29/11 19:08	7440-39-3	
Cadmium	**15.4**	mg/kg	0.12	20	06/28/11 17:42	06/29/11 19:08	7440-43-9	
Chromium	**8.3**	mg/kg	0.76	20	06/28/11 17:42	06/29/11 19:08	7440-47-3	
Copper	**5320**	mg/kg	7.6	200	06/28/11 17:42	07/01/11 12:03	7440-50-8	
Iron	**21800**	mg/kg	75.6	20	06/28/11 17:42	06/29/11 19:08	7439-89-6	
Lead	**4240**	mg/kg	1.5	200	06/28/11 17:42	07/01/11 12:03	7439-92-1	
Manganese	**1180**	mg/kg	7.6	200	06/28/11 17:42	07/01/11 12:03	7439-96-5	
Nickel	**6.1**	mg/kg	0.76	20	06/28/11 17:42	06/29/11 19:08	7440-02-0	
Silver	**37.6**	mg/kg	0.76	20	06/28/11 17:42	06/29/11 19:08	7440-22-4	
Zinc	**393**	mg/kg	7.6	20	06/28/11 17:42	06/29/11 19:08	7440-66-6	
7471 Mercury	Analytical Method: EPA 7471 Preparation Method: EPA 7471							
Mercury	**10.1**	mg/kg	0.62	20	06/29/11 16:02	06/30/11 10:00	7439-97-6	
Dry Weight	Analytical Method: % Moisture							
Percent Moisture	**35.8**	%	0.10	1		06/27/11 00:00		

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ANALYTICAL RESULTS

Project: Black Pine Mine
Pace Project No.: 10160673

Sample: CML-SD-08 **Lab ID: 10160673010** Collected: 06/14/11 15:15 Received: 06/17/11 08:50 Matrix: Solid

Results reported on a "dry-weight" basis

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
6020 MET ICPMS	Analytical Method: EPA 6020 Preparation Method: EPA 3050							
Antimony	**613**	mg/kg	6.3	200	06/28/11 17:42	07/01/11 12:16	7440-36-0	
Arsenic	**553**	mg/kg	0.63	20	06/28/11 17:42	06/29/11 19:12	7440-38-2	
Barium	**244**	mg/kg	0.38	20	06/28/11 17:42	06/29/11 19:12	7440-39-3	
Cadmium	**11.5**	mg/kg	0.10	20	06/28/11 17:42	06/29/11 19:12	7440-43-9	
Chromium	**5.6**	mg/kg	0.63	20	06/28/11 17:42	06/29/11 19:12	7440-47-3	
Copper	**1390**	mg/kg	6.3	200	06/28/11 17:42	07/01/11 12:16	7440-50-8	
Iron	**20100**	mg/kg	62.5	20	06/28/11 17:42	06/29/11 19:12	7439-89-6	
Lead	**2960**	mg/kg	1.3	200	06/28/11 17:42	07/01/11 12:16	7439-92-1	
Manganese	**443**	mg/kg	0.63	20	06/28/11 17:42	06/29/11 19:12	7439-96-5	
Nickel	**5.8**	mg/kg	0.63	20	06/28/11 17:42	06/29/11 19:12	7440-02-0	
Silver	**34.8**	mg/kg	0.63	20	06/28/11 17:42	06/29/11 19:12	7440-22-4	
Zinc	**430**	mg/kg	6.3	20	06/28/11 17:42	06/29/11 19:12	7440-66-6	
7471 Mercury	Analytical Method: EPA 7471 Preparation Method: EPA 7471							
Mercury	**12.1**	mg/kg	0.56	20	06/29/11 16:02	06/30/11 09:52	7439-97-6	
Dry Weight	Analytical Method: % Moisture							
Percent Moisture	**36.5**	%	0.10	1		06/27/11 00:00		

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ANALYTICAL RESULTS

Project: Black Pine Mine
Pace Project No.: 10160673

Sample: CML-SD-11 **Lab ID: 10160673011** Collected: 06/14/11 18:00 Received: 06/17/11 08:50 Matrix: Solid

Results reported on a "dry-weight" basis

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
6020 MET ICPMS	Analytical Method: EPA 6020 Preparation Method: EPA 3050							
Antimony	**307**	mg/kg	0.57	20	06/28/11 17:42	06/29/11 19:21	7440-36-0	
Arsenic	**219**	mg/kg	0.57	20	06/28/11 17:42	06/29/11 19:21	7440-38-2	
Barium	**145**	mg/kg	0.34	20	06/28/11 17:42	06/29/11 19:21	7440-39-3	
Cadmium	**4.6**	mg/kg	0.091	20	06/28/11 17:42	06/29/11 19:21	7440-43-9	
Chromium	**6.1**	mg/kg	0.57	20	06/28/11 17:42	06/29/11 19:21	7440-47-3	
Copper	**623**	mg/kg	5.7	200	06/28/11 17:42	07/01/11 12:21	7440-50-8	
Iron	**16300**	mg/kg	57.0	20	06/28/11 17:42	06/29/11 19:21	7439-89-6	
Lead	**1170**	mg/kg	1.1	200	06/28/11 17:42	07/01/11 12:21	7439-92-1	
Manganese	**1210**	mg/kg	5.7	200	06/28/11 17:42	07/01/11 12:21	7439-96-5	
Nickel	**6.5**	mg/kg	0.57	20	06/28/11 17:42	06/29/11 19:21	7440-02-0	
Silver	**14.8**	mg/kg	0.57	20	06/28/11 17:42	06/29/11 19:21	7440-22-4	
Zinc	**248**	mg/kg	5.7	20	06/28/11 17:42	06/29/11 19:21	7440-66-6	
7471 Mercury	Analytical Method: EPA 7471 Preparation Method: EPA 7471							
Mercury	**21.1**	mg/kg	0.51	20	06/29/11 16:02	06/30/11 09:54	7439-97-6	
Dry Weight	Analytical Method: % Moisture							
Percent Moisture	**21.0**	%	0.10	1		06/27/11 00:00		

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ANALYTICAL RESULTS

Project: Black Pine Mine
Pace Project No.: 10160673

Sample: CML-SD-01 **Lab ID: 10160673012** Collected: 06/14/11 13:23 Received: 06/17/11 08:50 Matrix: Solid

Results reported on a "dry-weight" basis

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
6020 MET ICPMS	Analytical Method: EPA 6020 Preparation Method: EPA 3050							
Antimony	**317**	mg/kg	0.50	20	06/28/11 17:42	06/29/11 20:02	7440-36-0	
Arsenic	**223**	mg/kg	0.50	20	06/28/11 17:42	06/29/11 20:02	7440-38-2	
Barium	**74.5**	mg/kg	3.0	200	06/28/11 17:42	07/01/11 12:25	7440-39-3	
Cadmium	**4.8**	mg/kg	0.079	20	06/28/11 17:42	06/29/11 20:02	7440-43-9	
Chromium	**6.2**	mg/kg	0.50	20	06/28/11 17:42	06/29/11 20:02	7440-47-3	
Copper	**378**	mg/kg	5.0	200	06/28/11 17:42	07/01/11 12:25	7440-50-8	
Iron	**14400**	mg/kg	49.5	20	06/28/11 17:42	06/29/11 20:02	7439-89-6	
Lead	**826**	mg/kg	0.99	200	06/28/11 17:42	07/01/11 12:25	7439-92-1	
Manganese	**413**	mg/kg	0.50	20	06/28/11 17:42	06/29/11 20:02	7439-96-5	
Nickel	**3.9**	mg/kg	0.50	20	06/28/11 17:42	06/29/11 20:02	7440-02-0	
Silver	**11.2**	mg/kg	0.50	20	06/28/11 17:42	06/29/11 20:02	7440-22-4	
Zinc	**188**	mg/kg	5.0	20	06/28/11 17:42	06/29/11 20:02	7440-66-6	
7471 Mercury	Analytical Method: EPA 7471 Preparation Method: EPA 7471							
Mercury	**17.6**	mg/kg	0.46	20	06/29/11 16:02	06/30/11 10:02	7439-97-6	
Dry Weight	Analytical Method: % Moisture							
Percent Moisture	**15.2**	%	0.10	1		06/27/11 00:00		

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ANALYTICAL RESULTS

Project: Black Pine Mine
Pace Project No.: 10160673

Sample: CML-SD-02 **Lab ID: 10160673013** Collected: 06/15/11 09:20 Received: 06/17/11 08:50 Matrix: Solid

Results reported on a "dry-weight" basis

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
6020 MET ICPMS	Analytical Method: EPA 6020 Preparation Method: EPA 3050							
Antimony	**461**	mg/kg	0.67	20	06/28/11 17:42	06/29/11 19:26	7440-36-0	
Arsenic	**417**	mg/kg	0.67	20	06/28/11 17:42	06/29/11 19:26	7440-38-2	
Barium	**308**	mg/kg	0.40	20	06/28/11 17:42	06/29/11 19:26	7440-39-3	
Cadmium	**8.9**	mg/kg	0.11	20	06/28/11 17:42	06/29/11 19:26	7440-43-9	
Chromium	**8.4**	mg/kg	0.67	20	06/28/11 17:42	06/29/11 19:26	7440-47-3	
Copper	**1430**	mg/kg	6.7	200	06/28/11 17:42	07/01/11 12:41	7440-50-8	
Iron	**22700**	mg/kg	67.0	20	06/28/11 17:42	06/29/11 19:26	7439-89-6	
Lead	**1970**	mg/kg	1.3	200	06/28/11 17:42	07/01/11 12:41	7439-92-1	
Manganese	**744**	mg/kg	6.7	200	06/28/11 17:42	07/01/11 12:41	7439-96-5	
Nickel	**6.9**	mg/kg	0.67	20	06/28/11 17:42	06/29/11 19:26	7440-02-0	
Silver	**25.6**	mg/kg	0.67	20	06/28/11 17:42	06/29/11 19:26	7440-22-4	
Zinc	**317**	mg/kg	6.7	20	06/28/11 17:42	06/29/11 19:26	7440-66-6	
7471 Mercury	Analytical Method: EPA 7471 Preparation Method: EPA 7471							
Mercury	**13.6**	mg/kg	0.50	20	06/29/11 16:02	06/30/11 10:37	7439-97-6	
Dry Weight	Analytical Method: % Moisture							
Percent Moisture	**29.6**	%	0.10	1		06/27/11 00:00		

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ANALYTICAL RESULTS

Project: Black Pine Mine
Pace Project No.: 10160673

Sample: BP-CML-SD-03-00 **Lab ID: 10160673014** Collected: 06/15/11 08:25 Received: 06/17/11 08:50 Matrix: Solid

Results reported on a "dry-weight" basis

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
6020 MET ICPMS	Analytical Method: EPA 6020 Preparation Method: EPA 3050							
Antimony	**16.8**	mg/kg	0.75	20	06/28/11 17:42	06/29/11 19:35	7440-36-0	M6
Arsenic	**19.4**	mg/kg	0.75	20	06/28/11 17:42	06/29/11 19:35	7440-38-2	
Barium	**143**	mg/kg	0.45	20	06/28/11 17:42	06/29/11 19:35	7440-39-3	M6
Cadmium	**0.43**	mg/kg	0.12	20	06/28/11 17:42	06/29/11 19:35	7440-43-9	
Chromium	**20.7**	mg/kg	0.75	20	06/28/11 17:42	06/29/11 19:35	7440-47-3	M6
Copper	**57.9**	mg/kg	0.75	20	06/28/11 17:42	06/29/11 19:35	7440-50-8	
Iron	**22300**	mg/kg	75.3	20	06/28/11 17:42	06/29/11 19:35	7439-89-6	M6
Lead	**207**	mg/kg	1.5	200	06/28/11 17:42	07/01/11 12:45	7439-92-1	M6
Manganese	**404**	mg/kg	0.75	20	06/28/11 17:42	06/29/11 19:35	7439-96-5	M6
Nickel	**9.1**	mg/kg	0.75	20	06/28/11 17:42	06/29/11 19:35	7440-02-0	
Silver	**1.6**	mg/kg	0.75	20	06/28/11 17:42	06/29/11 19:35	7440-22-4	
Zinc	**40.5**	mg/kg	7.5	20	06/28/11 17:42	06/29/11 19:35	7440-66-6	M6
7471 Mercury	Analytical Method: EPA 7471 Preparation Method: EPA 7471							
Mercury	**4.1**	mg/kg	0.69	20	06/29/11 16:02	06/30/11 10:14	7439-97-6	
Dry Weight	Analytical Method: % Moisture							
Percent Moisture	**43.8**	%	0.10	1		06/27/11 00:00		

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QUALITY CONTROL DATA

Project: Black Pine Mine
Pace Project No.: 10160673

QC Batch: MPRP/26726 Analysis Method: EPA 200.8
QC Batch Method: EPA 200.8 Analysis Description: 200.8 MET
Associated Lab Samples: 10160673004, 10160673005, 10160673006

METHOD BLANK: 998290 Matrix: Water
Associated Lab Samples: 10160673004, 10160673005, 10160673006

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Antimony	ug/L	<0.50	0.50	06/30/11 06:01	
Arsenic	ug/L	<0.50	0.50	06/30/11 06:01	
Barium	ug/L	<0.30	0.30	06/30/11 06:01	
Cadmium	ug/L	<0.080	0.080	06/30/11 06:01	
Chromium	ug/L	<0.50	0.50	06/30/11 06:01	
Copper	ug/L	<0.50	0.50	06/30/11 06:01	
Iron	ug/L	<50.0	50.0	06/30/11 06:01	
Lead	ug/L	<0.10	0.10	06/30/11 06:01	
Manganese	ug/L	<0.50	0.50	06/30/11 06:01	
Nickel	ug/L	<0.50	0.50	06/30/11 06:01	
Silver	ug/L	<0.50	0.50	06/30/11 06:01	
Zinc	ug/L	<5.0	5.0	06/30/11 06:01	

LABORATORY CONTROL SAMPLE: 998291

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Antimony	ug/L	80	79.8	100	85-115	
Arsenic	ug/L	80	82.4	103	85-115	
Barium	ug/L	80	81.9	102	85-115	
Cadmium	ug/L	80	81.5	102	85-115	
Chromium	ug/L	80	81.8	102	85-115	
Copper	ug/L	80	85.5	107	85-115	
Iron	ug/L	1000	1020	102	85-115	
Lead	ug/L	80	81.7	102	85-115	
Manganese	ug/L	80	82.0	102	85-115	
Nickel	ug/L	80	79.6	99	85-115	
Silver	ug/L	80	86.3	108	85-115	
Zinc	ug/L	80	77.7	97	85-115	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 998292 998293

Parameter	Units	10160655001 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Antimony	ug/L	42.9	80	80	125	128	103	106	70-130	2	20	
Arsenic	ug/L	12.8	80	80	95.3	95.4	103	103	70-130	.1	20	
Barium	ug/L	81.7	80	80	170	170	111	110	70-130	.5	20	
Cadmium	ug/L	1.2	80	80	84.3	82.5	104	102	70-130	2	20	
Chromium	ug/L	1.3	80	80	85.1	84.1	105	104	70-130	1	20	
Copper	ug/L	221	80	80	314	311	116	114	70-130	.7	20	
Iron	ug/L	1430	1000	1000	2810	2900	138	147	70-130	3	20	M1

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QUALITY CONTROL DATA

Project: Black Pine Mine
Pace Project No.: 10160673

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 998292 998293

Parameter	Units	10160655001 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Lead	ug/L	49.0	80	80	133	134	104	106	70-130	.8	20	
Manganese	ug/L	12.9	80	80	96.2	96.9	104	105	70-130	.7	20	
Nickel	ug/L	2.1	80	80	81.6	81.0	99	99	70-130	.8	20	
Silver	ug/L	0.64	80	80	80.9	84.1	100	104	70-130	4	20	
Zinc	ug/L	40.5	80	80	122	120	101	99	70-130	2	20	

MATRIX SPIKE SAMPLE: 998294

Parameter	Units	10160673004 Result	Spike Conc.	MS Result	MS % Rec	% Rec Limits	Qualifiers
Antimony	ug/L	0.53	80	78.9	98	70-130	
Arsenic	ug/L	1.1	80	82.3	101	70-130	
Barium	ug/L	85.4	80	169	104	70-130	
Cadmium	ug/L	<0.080	80	80.3	100	70-130	
Chromium	ug/L	1.3	80	83.0	102	70-130	
Copper	ug/L	22.5	80	106	104	70-130	
Iron	ug/L	1000	1000	2310	131	70-130	M1
Lead	ug/L	0.97	80	81.2	100	70-130	
Manganese	ug/L	8.9	80	89.0	100	70-130	
Nickel	ug/L	2.2	80	79.7	97	70-130	
Silver	ug/L	<0.50	80	78.7	98	70-130	
Zinc	ug/L	8.2	80	85.9	97	70-130	

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QUALITY CONTROL DATA

Project: Black Pine Mine
Pace Project No.: 10160673

QC Batch: MPRP/26729 Analysis Method: EPA 6020
QC Batch Method: EPA 3050 Analysis Description: 6020 MET
Associated Lab Samples: 10160673001, 10160673002, 10160673003, 10160673007, 10160673008, 10160673009, 10160673010, 10160673011, 10160673012, 10160673013, 10160673014

METHOD BLANK: 998304 Matrix: Solid
Associated Lab Samples: 10160673001, 10160673002, 10160673003, 10160673007, 10160673008, 10160673009, 10160673010, 10160673011, 10160673012, 10160673013, 10160673014

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Antimony	mg/kg	<0.41	0.41	06/29/11 18:04	
Arsenic	mg/kg	<0.41	0.41	06/29/11 18:04	
Barium	mg/kg	<0.25	0.25	06/29/11 18:04	
Cadmium	mg/kg	<0.066	0.066	06/29/11 18:04	
Chromium	mg/kg	<0.41	0.41	06/29/11 18:04	
Copper	mg/kg	<0.41	0.41	06/29/11 18:04	
Iron	mg/kg	<41.3	41.3	06/29/11 18:04	
Lead	mg/kg	<0.083	0.083	07/01/11 11:24	
Manganese	mg/kg	<0.41	0.41	06/29/11 18:04	
Nickel	mg/kg	<0.41	0.41	06/29/11 18:04	
Silver	mg/kg	<0.41	0.41	06/29/11 18:04	
Zinc	mg/kg	<4.1	4.1	06/29/11 18:04	

LABORATORY CONTROL SAMPLE: 998305

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Antimony	mg/kg	17.9	18.5	103	75-125	
Arsenic	mg/kg	17.9	19.0	106	75-125	
Barium	mg/kg	17.9	19.5	109	75-125	
Cadmium	mg/kg	17.9	19.1	107	75-125	
Chromium	mg/kg	17.9	19.5	109	75-125	
Copper	mg/kg	17.9	20.1	113	75-125	
Iron	mg/kg	223	248	111	75-125	
Lead	mg/kg	17.9	19.5	109	75-125	
Manganese	mg/kg	17.9	19.8	111	75-125	
Nickel	mg/kg	17.9	20.1	113	75-125	
Silver	mg/kg	17.9	20.5	115	75-125	
Zinc	mg/kg	17.9	19.7	110	75-125	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 998306 998307

Parameter	Units	10160673001 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Antimony	mg/kg	16.7	43.1	54.2	51.5	63.1	81	85	75-125	20	20	
Arsenic	mg/kg	27.9	43.1	54.2	72.3	84.9	103	105	75-125	16	20	
Barium	mg/kg	335	43.1	54.2	400	425	151	166	75-125	6	20	M6
Cadmium	mg/kg	1.4	43.1	54.2	43.5	55.7	98	100	75-125	25	20	D6
Chromium	mg/kg	8.3	43.1	54.2	60.7	70.9	122	115	75-125	15	20	

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QUALITY CONTROL DATA

Project: Black Pine Mine
Pace Project No.: 10160673

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 998306 998307

Parameter	Units	10160673001 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Copper	mg/kg	109	43.1	54.2	173	172	149	115	75-125	.7	20	M6
Iron	mg/kg	12400	539	678	15600	15500	596	454	75-125	.8	20	M6
Lead	mg/kg	74.2	43.1	54.2	140	150	154	139	75-125	6	20	M6
Manganese	mg/kg	1980	43.1	54.2	1850	1860	-295	-213	75-125	.6	20	M6
Nickel	mg/kg	11.4	43.1	54.2	60.1	71.7	113	111	75-125	18	20	
Silver	mg/kg	2.2	43.1	54.2	47.3	58.9	105	104	75-125	22	20	D6
Zinc	mg/kg	144	43.1	54.2	210	219	154	138	75-125	4	20	M6

MATRIX SPIKE SAMPLE: 998308

Parameter	Units	10160673014 Result	Spike Conc.	MS Result	MS % Rec	% Rec Limits	Qualifiers
Antimony	mg/kg	16.8	32.4	32.0	47	75-125	M6
Arsenic	mg/kg	19.4	32.4	51.9	100	75-125	
Barium	mg/kg	143	32.4	248	324	75-125	M6
Cadmium	mg/kg	0.43	32.4	32.0	98	75-125	
Chromium	mg/kg	20.7	32.4	66.1	140	75-125	M6
Copper	mg/kg	57.9	32.4	85.9	86	75-125	
Iron	mg/kg	22300	404	36400	3500	75-125	M6
Lead	mg/kg	207	32.4	131	-236	75-125	M6
Manganese	mg/kg	404	32.4	1300	2780	75-125	M6
Nickel	mg/kg	9.1	32.4	46.0	114	75-125	
Silver	mg/kg	1.6	32.4	34.5	102	75-125	
Zinc	mg/kg	40.5	32.4	109	213	75-125	M6

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QUALITY CONTROL DATA

Project: Black Pine Mine
Pace Project No.: 10160673

QC Batch: MERP/5542 Analysis Method: EPA 7471
QC Batch Method: EPA 7471 Analysis Description: 7471 Mercury
Associated Lab Samples: 10160673001, 10160673002, 10160673003, 10160673007, 10160673008, 10160673009, 10160673010, 10160673011, 10160673012, 10160673013, 10160673014

METHOD BLANK: 999060 Matrix: Solid
Associated Lab Samples: 10160673001, 10160673002, 10160673003, 10160673007, 10160673008, 10160673009, 10160673010, 10160673011, 10160673012, 10160673013, 10160673014

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Mercury	mg/kg	<0.019	0.019	06/30/11 08:35	

LABORATORY CONTROL SAMPLE: 999061

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Mercury	mg/kg	.48	0.50	104	80-120	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 999062 999063

Parameter	Units	10160673001 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Mercury	mg/kg	14.4	1.4	1.5	14.3	20.1	-9	368	80-120	34	20	D6,M6

MATRIX SPIKE SAMPLE: 999064

Parameter	Units	10160707009 Result	Spike Conc.	MS Result	MS % Rec	% Rec Limits	Qualifiers
Mercury	mg/kg	27.4	1.3	27.7	16	80-120	M6

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QUALITY CONTROL DATA

Project: Black Pine Mine
Pace Project No.: 10160673

QC Batch: MPRP/26859 Analysis Method: % Moisture
QC Batch Method: % Moisture Analysis Description: Dry Weight/Percent Moisture
Associated Lab Samples: 10160673001, 10160673002, 10160673003, 10160673007, 10160673008, 10160673009, 10160673010

SAMPLE DUPLICATE: 1002964

Parameter	Units	10160828002 Result	Dup Result	RPD	Max RPD	Qualifiers
Percent Moisture	%	16.6	16.7	.1	30	

SAMPLE DUPLICATE: 1002965

Parameter	Units	10160673010 Result	Dup Result	RPD	Max RPD	Qualifiers
Percent Moisture	%	36.5	40.6	11	30	

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QUALITY CONTROL DATA

Project: Black Pine Mine
Pace Project No.: 10160673

QC Batch: MPRP/26864 Analysis Method: % Moisture
QC Batch Method: % Moisture Analysis Description: Dry Weight/Percent Moisture
Associated Lab Samples: 10160673011, 10160673012, 10160673013, 10160673014

SAMPLE DUPLICATE: 1003029

Parameter	Units	10160673011 Result	Dup Result	RPD	Max RPD	Qualifiers
Percent Moisture	%	21.0	21.1	.5	30	

SAMPLE DUPLICATE: 1003030

Parameter	Units	10160756011 Result	Dup Result	RPD	Max RPD	Qualifiers
Percent Moisture	%	31.0	34.4	10	30	

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QUALITY CONTROL DATA

Project: Black Pine Mine
Pace Project No.: 10160673

QC Batch: MT/6228 Analysis Method: SM 2310
QC Batch Method: SM 2310 Analysis Description: 2310 Acidity
Associated Lab Samples: 10160673004, 10160673005, 10160673006

METHOD BLANK: 1000993 Matrix: Water
Associated Lab Samples: 10160673004, 10160673005, 10160673006

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Acidity	mg/L	<5.0	5.0	06/24/11 16:00	

SAMPLE DUPLICATE: 1000995

Parameter	Units	10160655003 Result	Dup Result	RPD	Max RPD	Qualifiers
Acidity	mg/L	16.7	16.7	0	20	

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QUALITY CONTROL DATA

Project: Black Pine Mine
Pace Project No.: 10160673

QC Batch: MT/6192 Analysis Method: SM 2540D
QC Batch Method: SM 2540D Analysis Description: 2540D Total Suspended Solids
Associated Lab Samples: 10160673004, 10160673005, 10160673006

METHOD BLANK: 998564 Matrix: Water
Associated Lab Samples: 10160673004, 10160673005, 10160673006

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Total Suspended Solids	mg/L	<1.0	1.0	06/20/11 10:40	

LABORATORY CONTROL SAMPLE: 998563

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Total Suspended Solids	mg/L	25	25.0	100	71-129	

SAMPLE DUPLICATE: 998919

Parameter	Units	10160673006 Result	Dup Result	RPD	Max RPD	Qualifiers
Total Suspended Solids	mg/L	<2.0	<2.0		20	

SAMPLE DUPLICATE: 998920

Parameter	Units	10160655005 Result	Dup Result	RPD	Max RPD	Qualifiers
Total Suspended Solids	mg/L	<2.0	2.2		20	

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QUALITY CONTROL DATA

Project: Black Pine Mine
Pace Project No.: 10160673

QC Batch: MT/6195 Analysis Method: EPA 300.0
QC Batch Method: EPA 300.0 Analysis Description: 300.0 IC Anions
Associated Lab Samples: 10160673004, 10160673005, 10160673006

METHOD BLANK: 998638 Matrix: Water
Associated Lab Samples: 10160673004, 10160673005, 10160673006

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Sulfate	mg/L	<1.0	1.0	06/23/11 22:15	

LABORATORY CONTROL SAMPLE: 998639

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Sulfate	mg/L	20	19.5	98	90-110	

MATRIX SPIKE SAMPLE: 998640

Parameter	Units	10160067001 Result	Spike Conc.	MS Result	MS % Rec	% Rec Limits	Qualifiers
Sulfate	mg/L	12.5	20	32.2	99	80-120	

MATRIX SPIKE SAMPLE: 998642

Parameter	Units	10160709001 Result	Spike Conc.	MS Result	MS % Rec	% Rec Limits	Qualifiers
Sulfate	mg/L	4110	4000	8170	101	80-120	

SAMPLE DUPLICATE: 998641

Parameter	Units	10160067002 Result	Dup Result	RPD	Max RPD	Qualifiers
Sulfate	mg/L	14.1	18.4	26	20	D6

SAMPLE DUPLICATE: 998643

Parameter	Units	10160709002 Result	Dup Result	RPD	Max RPD	Qualifiers
Sulfate	mg/L	5330	5370	.6	20	

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QUALITY CONTROL DATA

Project: Black Pine Mine
Pace Project No.: 10160673

QC Batch: WET/22674 Analysis Method: SM 2320B
QC Batch Method: SM 2320B Analysis Description: 2320B Alkalinity
Associated Lab Samples: 10160673004, 10160673005, 10160673006

METHOD BLANK: 998338 Matrix: Water
Associated Lab Samples: 10160673004, 10160673005, 10160673006

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Alkalinity, Total as CaCO3	mg/L	<5.0	5.0	06/20/11 11:16	

LABORATORY CONTROL SAMPLE & LCSD: 998339 998340

Parameter	Units	Spike Conc.	LCS Result	LCSD Result	LCS % Rec	LCSD % Rec	% Rec Limits	RPD	Max RPD	Qualifiers
Alkalinity, Total as CaCO3	mg/L	40	39.0	39.7	98	99	90-110	2	30	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 998341 998342

Parameter	Units	10160707001 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Alkalinity, Total as CaCO3	mg/L	13.4	40	40	53.2	53.8	99	101	80-120	1	30	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 998343 998344

Parameter	Units	10160722002 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Alkalinity, Total as CaCO3	mg/L	232	40	40	281	283	124	127	80-120	.4	30	M1

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QUALITY CONTROL DATA

Project: Black Pine Mine
Pace Project No.: 10160673

QC Batch: WET/22678 Analysis Method: SM 2540C
QC Batch Method: SM 2540C Analysis Description: 2540C Total Dissolved Solids
Associated Lab Samples: 10160673004, 10160673005, 10160673006

METHOD BLANK: 998440 Matrix: Water
Associated Lab Samples: 10160673004, 10160673005, 10160673006

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Total Dissolved Solids	mg/L	<10.0	10.0	06/20/11 12:01	

LABORATORY CONTROL SAMPLE: 998441

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Total Dissolved Solids	mg/L	1000	982	98	80-120	

SAMPLE DUPLICATE: 998442

Parameter	Units	10160707001 Result	Dup Result	RPD	Max RPD	Qualifiers
Total Dissolved Solids	mg/L	125	115	8	20	

SAMPLE DUPLICATE: 998443

Parameter	Units	10160655002 Result	Dup Result	RPD	Max RPD	Qualifiers
Total Dissolved Solids	mg/L	103	94.0	9	20	

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QUALIFIERS

Project: Black Pine Mine
Pace Project No.: 10160673

DEFINITIONS

DF - Dilution Factor, if reported, represents the factor applied to the reported data due to changes in sample preparation, dilution of the sample aliquot, or moisture content.

ND - Not Detected at or above adjusted reporting limit.

J - Estimated concentration above the adjusted method detection limit and below the adjusted reporting limit.

MDL - Adjusted Method Detection Limit.

S - Surrogate

1,2-Diphenylhydrazine (8270 listed analyte) decomposes to Azobenzene.

Consistent with EPA guidelines, unrounded data are displayed and have been used to calculate % recovery and RPD values.

LCS(D) - Laboratory Control Sample (Duplicate)

MS(D) - Matrix Spike (Duplicate)

DUP - Sample Duplicate

RPD - Relative Percent Difference

NC - Not Calculable.

SG - Silica Gel - Clean-Up

U - Indicates the compound was analyzed for, but not detected.

N-Nitrosodiphenylamine decomposes and cannot be separated from Diphenylamine using Method 8270. The result reported for each analyte is a combined concentration.

LABORATORIES

PASI-M	Pace Analytical Services - Minneapolis
PASI-MT	Pace Analytical Services - Montana

ANALYTE QUALIFIERS

D6	The relative percent difference (RPD) between the sample and sample duplicate exceeded laboratory control limits.
M1	Matrix spike recovery exceeded QC limits. Batch accepted based on laboratory control sample (LCS) recovery.
M6	Matrix spike and Matrix spike duplicate recovery not evaluated against control limits due to sample dilution.

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QUALITY CONTROL DATA CROSS REFERENCE TABLE

Project: Black Pine Mine
Pace Project No.: 10160673

Lab ID	Sample ID	QC Batch Method	QC Batch	Analytical Method	Analytical Batch
10160673004	**TSP-6**	EPA 200.8	MPRP/26726	EPA 200.8	ICPM/10928
10160673005	**CML-SW-17**	EPA 200.8	MPRP/26726	EPA 200.8	ICPM/10928
10160673006	**CML-SW-18**	EPA 200.8	MPRP/26726	EPA 200.8	ICPM/10928
10160673001	**BP-CML-SD-04-00**	EPA 3050	MPRP/26729	EPA 6020	ICPM/10930
10160673002	**BP-CML-SD-05-00**	EPA 3050	MPRP/26729	EPA 6020	ICPM/10930
10160673003	**BP-CML-SD-03-00**	EPA 3050	MPRP/26729	EPA 6020	ICPM/10930
10160673007	**CML-SD-09**	EPA 3050	MPRP/26729	EPA 6020	ICPM/10930
10160673008	**CML-SD-10**	EPA 3050	MPRP/26729	EPA 6020	ICPM/10930
10160673009	**CML-SD-07**	EPA 3050	MPRP/26729	EPA 6020	ICPM/10930
10160673010	**CML-SD-08**	EPA 3050	MPRP/26729	EPA 6020	ICPM/10930
10160673011	**CML-SD-11**	EPA 3050	MPRP/26729	EPA 6020	ICPM/10930
10160673012	**CML-SD-01**	EPA 3050	MPRP/26729	EPA 6020	ICPM/10930
10160673013	**CML-SD-02**	EPA 3050	MPRP/26729	EPA 6020	ICPM/10930
10160673014	**BP-CML-SD-03-00**	EPA 3050	MPRP/26729	EPA 6020	ICPM/10930
10160673001	**BP-CML-SD-04-00**	EPA 7471	MERP/5542	EPA 7471	MERC/6387
10160673002	**BP-CML-SD-05-00**	EPA 7471	MERP/5542	EPA 7471	MERC/6387
10160673003	**BP-CML-SD-03-00**	EPA 7471	MERP/5542	EPA 7471	MERC/6387
10160673007	**CML-SD-09**	EPA 7471	MERP/5542	EPA 7471	MERC/6387
10160673008	**CML-SD-10**	EPA 7471	MERP/5542	EPA 7471	MERC/6387
10160673009	**CML-SD-07**	EPA 7471	MERP/5542	EPA 7471	MERC/6387
10160673010	**CML-SD-08**	EPA 7471	MERP/5542	EPA 7471	MERC/6387
10160673011	**CML-SD-11**	EPA 7471	MERP/5542	EPA 7471	MERC/6387
10160673012	**CML-SD-01**	EPA 7471	MERP/5542	EPA 7471	MERC/6387
10160673013	**CML-SD-02**	EPA 7471	MERP/5542	EPA 7471	MERC/6387
10160673014	**BP-CML-SD-03-00**	EPA 7471	MERP/5542	EPA 7471	MERC/6387
10160673001	**BP-CML-SD-04-00**	% Moisture	MPRP/26859		
10160673002	**BP-CML-SD-05-00**	% Moisture	MPRP/26859		
10160673003	**BP-CML-SD-03-00**	% Moisture	MPRP/26859		
10160673007	**CML-SD-09**	% Moisture	MPRP/26859		
10160673008	**CML-SD-10**	% Moisture	MPRP/26859		
10160673009	**CML-SD-07**	% Moisture	MPRP/26859		
10160673010	**CML-SD-08**	% Moisture	MPRP/26859		
10160673011	**CML-SD-11**	% Moisture	MPRP/26864		
10160673012	**CML-SD-01**	% Moisture	MPRP/26864		
10160673013	**CML-SD-02**	% Moisture	MPRP/26864		
10160673014	**BP-CML-SD-03-00**	% Moisture	MPRP/26864		
10160673004	**TSP-6**	SM 2310	MT/6228		
10160673005	**CML-SW-17**	SM 2310	MT/6228		
10160673006	**CML-SW-18**	SM 2310	MT/6228		
10160673004	**TSP-6**	SM 2540D	MT/6192		
10160673005	**CML-SW-17**	SM 2540D	MT/6192		
10160673006	**CML-SW-18**	SM 2540D	MT/6192		
10160673004	**TSP-6**	EPA 300.0	MT/6195		
10160673005	**CML-SW-17**	EPA 300.0	MT/6195		
10160673006	**CML-SW-18**	EPA 300.0	MT/6195		

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QUALITY CONTROL DATA CROSS REFERENCE TABLE

Project: Black Pine Mine
Pace Project No.: 10160673

Lab ID	Sample ID	QC Batch Method	QC Batch	Analytical Method	Analytical Batch
10160673004	**TSP-6**	SM 2320B	WET/22674		
10160673005	**CML-SW-17**	SM 2320B	WET/22674		
10160673006	**CML-SW-18**	SM 2320B	WET/22674		
10160673004	**TSP-6**	SM 2540C	WET/22678		
10160673005	**CML-SW-17**	SM 2540C	WET/22678		
10160673006	**CML-SW-18**	SM 2540C	WET/22678		

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CHAIN-OF-CUSTODY / Analytical Request Document

The Chain-of-Custody is a LEGAL DOCUMENT. All relevant fields must be completed accurately.

Page: 1 of 2

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Section A Required Client Information:	Section B Required Project Information:	Section C Invoice Information:
Company: Herrera	Report To: Kevin Houck	Attention:
Address:	Copy To:	Company Name: DEQ
		Address:
Email To:	Purchase Order No.:	Pace Quote Reference:
Phone: Fax:	Project Name: Black Pine Mine	Pace Project Manager:
Requested Due Date/TAT:	Project Number:	Pace Profile #:

REGULATORY AGENCY

☐ NPDES ☐ GROUND WATER ☐ DRINKING WATER

☐ UST ☐ RCRA ☐ OTHER _____

Site Location STATE: _____

Section D Required Client Information

SAMPLE ID
(A-Z, 0-9 / ,-)
Sample IDs MUST BE UNIQUE

Matrix Codes — MATRIX / CODE
Drinking Water DW
Water WT
Waste Water WW
Product P
Soil/Solid SL
Oil OL
Wipe WP
Air AR
Tissue TS
Other OT

Requested Analysis Filtered (Y/N)

ITEM #	SAMPLE ID	MATRIX CODE (see valid codes to left)	SAMPLE TYPE (G=GRAB C=COMP)	COLLECTED COMPOSITE START DATE	COLLECTED COMPOSITE START TIME	COLLECTED COMPOSITE END/GRAB DATE	COLLECTED COMPOSITE END/GRAB TIME	SAMPLE TEMP AT COLLECTION	# OF CONTAINERS	Preservatives: Unpreserved	H_2SO_4	HNO_3	HCl	NaOH	$Na_2S_2O_3$	Methanol	Other	Analysis Test Y/N	TSS	Alk; TDS Acidity, sulfate	Total Metals	Total Metals (solid)	Residual Chlorine (Y/N)	Pace Project No./ Lab I.D.
																			N	M	M	Y	N		10160673
1	BP-CML-SD-04-00	S	G			6/14/11	1630		1	X													X		-001
2	BP-CML-SD-05-00	S	G				1425		1	X													X		-002
3	BP-CML-SD-03-00	S	G				1355		1	X													X		-003
4	TSP-6	W	G				1350		4	X		X							X	X	X	X			-004
5	CML-SW-17	↓	↓				1745		4	X		X							X	X	X	X			-005
6	CML-SW-18	↓	↓				1420		4	X		X							X	X	X	X			-006
7	CML-SD-09	S	G				1500		1	X													X		-007
8	CML-SD-10	↓	↓				1645		1	X													X		-008
9	CML-SD-07	↓	↓				1010		1	X													X		-009
10	CML-SD-08	↓	↓				1515		1	X													X		-010
11	CML-SD-11	↓	↓				1800		1	X													X		-011
12	CML-SD-01	↓	↓			↓	1323		1	X													X		-012

ADDITIONAL COMMENTS	RELINQUISHED BY / AFFILIATION	DATE	TIME	ACCEPTED BY / AFFILIATION	DATE	TIME	SAMPLE CONDITIONS			
	Gina Catarra/Herrera	6/15/11	10:15				20	5	5	5
	Fedex	6/17/11	0850	Norma C. Trankley/Pace for Ray Varley	6/17/11	0850				

ORIGINAL

SAMPLER NAME AND SIGNATURE

PRINT Name of SAMPLER: Gina Catarra

SIGNATURE of SAMPLER: [signature] DATE Signed (MM/DD/YY): 6/15/11

Temp in °C | Received on Ice (Y/N) | Custody Sealed Cooler (Y/N) | Samples Intact (Y/N)

*Important Note: By signing this form you are accepting Pace's NET 30 day payment terms and agreeing to late charges of 1.5% per month for any invoices not paid within 30 days.

F-ALL-Q-020rev.07, 15-May-2007

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Page: 2 of 2

1321608

Section A Required Client Information:	Section B Required Project Information:	Section C Invoice Information:
Company: Herrera	Report To: Kevin Houck	Attention:
Address:	Copy To:	Company Name: DEQ
		Address:
Email To:	Purchase Order No.:	Pace Quote Reference:
Phone: Fax:	Project Name: Black Pine Mine	Pace Project Manager:
Requested Due Date/TAT:	Project Number:	Pace Profile #:

REGULATORY AGENCY

☐ NPDES ☐ GROUND WATER ☐ DRINKING WATER

☐ UST ☐ RCRA ☐ OTHER _____

Site Location STATE: _____

Requested Analysis Filtered (Y/N)

ITEM #	Section D Required Client Information — SAMPLE ID (A-Z, 0-9 / ,-) Sample IDs MUST BE UNIQUE	Matrix Codes MATRIX / CODE: Drinking Water DW, Water WT, Waste Water WW, Product P, Soil/Solid SL, Oil OL, Wipe WP, Air AR, Tissue TS, Other OT	MATRIX CODE (see valid codes to left)	SAMPLE TYPE (G=GRAB C=COMP)	COLLECTED: COMPOSITE START DATE	COMPOSITE START TIME	COMPOSITE END/GRAB DATE	COMPOSITE END/GRAB TIME	SAMPLE TEMP AT COLLECTION	# OF CONTAINERS	Preservatives: Unpreserved	H_2SO_4	HNO_3	HCl	NaOH	$Na_2S_2O_3$	Methanol	Other	Analysis Test ↓ Y/N	TSS	TDS	Acidity (sulfuric)	Total Metals (solid)	Residual Chlorine (Y/N)	Pace Project No./ Lab I.D.
1	CML-SD-02		S	G	6/15		6/15/11	0920		1	X								N	X			X			10160673 -013
2	BP-CML-SD-03-00		S	G			↓	0825		1	X								N	X			X			-014
3																										
4																										
5																										
6																										
7																										
8																										
9																										
10																										
11																										
12																										

ADDITIONAL COMMENTS	RELINQUISHED BY / AFFILIATION	DATE	TIME	ACCEPTED BY / AFFILIATION	DATE	TIME	SAMPLE CONDITIONS
	Gina Catarra/Herrera	6/15/11	10:15				
	Fedex	6/17/11	0850	Norma C. Frankle/Pace for Ray Varley	6/17/11	0850	
							2.0 / Y / Y / Y

Temp in °C | Received on Ice (Y/N) | Custody Sealed Cooler (Y/N) | Samples Intact (Y/N)

ORIGINAL

SAMPLER NAME AND SIGNATURE

PRINT Name of SAMPLER: Gina Catarra

SIGNATURE of SAMPLER: [signature] DATE Signed (MM/DD/YY): 6/15/11

*Important Note: By signing this form you are accepting Pace's NET 30 day payment terms and agreeing to late charges of 1.5% per month for any invoices not paid within 30 days.

Sample Condition Upon Receipt

Pace Analytical

Client Name: Hessera Env **Project #** 10160613

Courier: [x] Fed Ex [ ] UPS [ ] USPS [ ] Client [ ] Commercial [ ] Pace Other ________

Tracking #: 8297 1844 2001 3271

Custody Seal on Cooler/Box Present: [x] yes [ ] no Seals intact: [x] yes [ ] no

Packing Material: [ ] Bubble Wrap [x] Bubble Bags [ ] None [ ] Other ________ Temp Blank: Yes ✓ No ______

Thermometer Used (1383045) or 135 **Type of Ice:** (Wet) Blue None [x] Samples on ice, cooling process has begun

Cooler Temperature 2.0 **Biological Tissue Is Frozen:** Yes No

Temp should be above freezing to 6°C

Date and Initials of person examining contents: MG 6/1/14

Comments:

Chain of Custody Present:	[x] Yes	[ ] No	[ ] N/A	1.
Chain of Custody Filled Out:	[x] Yes	[ ] No	[ ] N/A	2.
Chain of Custody Relinquished:	[x] Yes	[ ] No	[ ] N/A	3.
Sampler Name & Signature on COC:	[x] Yes	[ ] No	[ ] N/A	4.
Samples Arrived within Hold Time:	[x] Yes	[ ] No	[ ] N/A	5.
Short Hold Time Analysis (<72hr):	[ ] Yes	[x] No	[x] N/A (crossed out, initialed)	6.
Rush Turn Around Time Requested:	[ ] Yes	[x] No	[ ] N/A	7.
Sufficient Volume:	[x] Yes	[ ] No	[ ] N/A	8.
Correct Containers Used:	[x] Yes	[ ] No	[ ] N/A	9.
-Pace Containers Used:	[x] Yes	[ ] No	[ ] N/A	
Containers Intact:	[x] Yes	[ ] No	[ ] N/A	10.
Filtered volume received for Dissolved tests	[ ] Yes	[ ] No	[x] N/A	11.
Sample Labels match COC:	[ ] Yes	[x] No	[ ] N/A	12. 003-BP-15-5000 date + time not
-Includes date/time/ID/Analysis Matrix: water				
All containers needing acid/base preservation have been checked. Noncompliance are noted in 13.	[x] Yes	[ ] No	[ ] N/A	13. [x] HNO3 [ ] H2SO4 [ ] NaOH [ ] HCl
All containers needing preservation are found to be in compliance with EPA recommendation.	[x] Yes	[ ] No	[ ] N/A	Samp # 1-3
Exceptions: VOA,Coliform, TOC, Oil and Grease, WI-DRO (water)	[ ] Yes	[x] No		Initial when completed / Lot # of added preservative
Samples checked for dechlorination:	[ ] Yes	[ ] No	[x] N/A	14.
Headspace in VOA Vials (>6mm):	[ ] Yes	[ ] No	[x] N/A	15.
Trip Blank Present:	[ ] Yes	[ ] No	[x] N/A	16.
Trip Blank Custody Seals Present	[ ] Yes	[ ] No	[x] N/A	
Pace Trip Blank Lot # (if purchased):________				

Client Notification/ Resolution: Field Data Required? Y / N

Person Contacted: ________________ Date/Time: ________

Comments/ Resolution: ________________________________

Project Manager Review: (signature) **Date:** 6/1/14

Note: Whenever there is a discrepancy affecting North Carolina compliance samples, a copy of this form will be sent to the North Carolina DEHNR Certification Office (i.e out of hold, incorrect preservative, out of temp, incorrect containers)

Pace Analytical Services, Inc.
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(406)254-7226

July 01, 2011

Kevin Houck
Herrera Environmental Consultants
101 East Broadway, Suite 610
Missoula, MT 59802

RE: Project: Black Pine Mine
Pace Project No.: 10160707

Dear Kevin Houck:
Enclosed are the analytical results for sample(s) received by the laboratory on June 17, 2011. The results relate only to the samples included in this report.

If you have any questions concerning this report, please feel free to contact me.

Sincerely,

Denise Jensen

denise.jensen@pacelabs.com
Project Manager

Enclosures

cc: Devin Clary, Montana Dept. of Environmental Quality
Mark Donner, Trihydro

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CERTIFICATIONS

Project: Black Pine Mine
Pace Project No.: 10160707

Minnesota Certification IDs

1700 Elm Street SE Suite 200, Minneapolis, MN 55414
A2LA Certification #: 2926.01
Alaska Certification #: UST-078
Alaska Certification #MN00064
Arizona Certification #: AZ-0014
Arkansas Certification #: 88-0680
California Certification #: 01155CA
EPA Region 8 Certification #: Pace
Florida/NELAP Certification #: E87605
Georgia Certification #: 959
Idaho Certification #: MN00064
Illinois Certification #: 200011
Iowa Certification #: 368
Kansas Certification #: E-10167
Louisiana Certification #: 03086
Louisiana Certification #: LA080009
Maine Certification #: 2007029
Maryland Certification #: 322
Michigan DEQ Certification #: 9909
Minnesota Certification #: 027-053-137
Mississippi Certification #: Pace
Montana Certification #: MT CERT0092
Nebraska Certification #: Pace
Nevada Certification #: MN_00064
New Jersey Certification #: MN-002
New Mexico Certification #: Pace
New York Certification #: 11647
North Carolina Certification #: 530
North Dakota Certification #: R-036
North Dakota Certification #: R-036A
Ohio VAP Certification #: CL101
Oklahoma Certification #: D9921
Oklahoma Certification #: 9507
Oregon Certification #: MN200001
Pennsylvania Certification #: 68-00563
Puerto Rico Certification
Tennessee Certification #: 02818
Texas Certification #: T104704192
Washington Certification #: C754
Wisconsin Certification #: 999407970

Montana Certification IDs

602 South 25th Street, Billings, MT 59101
EPA Region 8 Certification #: 8TMS-Q
Idaho Certification #: MT00012
Montana Certification #: MT CERT0040
NVLAP Certification #: 101292-0
Minnesota Dept of Health Certification #: 030-999-442

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SAMPLE SUMMARY

Project: Black Pine Mine
Pace Project No.: 10160707

Lab ID	Sample ID	Matrix	Date Collected	Date Received
10160707001	**TSP-8**	Water	06/13/11 16:45	06/17/11 08:50
10160707002	**BP-TS-SD-01-00**	Solid	06/13/11 16:55	06/17/11 08:50
10160707003	**CML-SW-06**	Water	06/13/11 16:30	06/17/11 08:50
10160707004	**CML-SD-06-00**	Solid	06/13/11 16:35	06/17/11 08:50
10160707005	**TSP-3**	Water	06/13/11 15:30	06/17/11 08:50
10160707006	**BP-TS-SD-02-00**	Solid	06/13/11 15:40	06/17/11 08:50
10160707007	**TSP-9**	Water	06/13/11 17:30	06/17/11 08:50
10160707008	**MCSP-1**	Water	06/13/11 14:40	06/17/11 08:50
10160707009	**HM-SD-01**	Solid	06/13/11 14:45	06/17/11 08:50

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SAMPLE ANALYTE COUNT

Project: Black Pine Mine
Pace Project No.: 10160707

Lab ID	Sample ID	Method	Analysts	Analytes Reported	Laboratory
10160707001	**TSP-8**	EPA 200.8	CJS, TL1	12	PASI-M
		SM 2310	CAC	1	PASI-MT
		SM 2540D	SR1	1	PASI-MT
		EPA 300.0	JH1	1	PASI-MT
		SM 2320B	MWD	1	PASI-M
		SM 2540C	PH1	1	PASI-M
10160707002	**BP-TS-SD-01-00**	EPA 6020	CJS, RJS	12	PASI-M
		EPA 7471	TEM	1	PASI-M
		% Moisture	JDL	1	PASI-M
10160707003	**CML-SW-06**	EPA 200.8	CJS, TL1	12	PASI-M
		SM 2310	CAC	1	PASI-MT
		SM 2540D	SR1	1	PASI-MT
		EPA 300.0	JH1	1	PASI-MT
		SM 2320B	MWD	1	PASI-M
		SM 2540C	PH1	1	PASI-M
10160707004	**CML-SD-06-00**	EPA 6020	CJS, RJS	12	PASI-M
		EPA 7471	TEM	1	PASI-M
		% Moisture	JDL	1	PASI-M
10160707005	**TSP-3**	EPA 200.8	CJS, TL1	12	PASI-M
		SM 2310	CAC	1	PASI-MT
		SM 2540D	SR1	1	PASI-MT
		EPA 300.0	JH1	1	PASI-MT
		SM 2320B	MWD	1	PASI-M
		SM 2540C	PH1	1	PASI-M
10160707006	**BP-TS-SD-02-00**	EPA 6020	CJS, RJS	12	PASI-M
		EPA 7471	TEM	1	PASI-M
		% Moisture	JDL	1	PASI-M
10160707007	**TSP-9**	EPA 200.8	CJS, TL1	12	PASI-M
		SM 2310	CAC	1	PASI-MT
		SM 2540D	SR1	1	PASI-MT
		EPA 300.0	JH1	1	PASI-MT
		SM 2320B	MWD	1	PASI-M
		SM 2540C	PH1	1	PASI-M
10160707008	**MCSP-1**	EPA 200.8	CJS, TL1	12	PASI-M
		SM 2310	CAC	1	PASI-MT
		SM 2540D	SR1	1	PASI-MT
		EPA 300.0	JH1	1	PASI-MT

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SAMPLE ANALYTE COUNT

Project: Black Pine Mine
Pace Project No.: 10160707

Lab ID	Sample ID	Method	Analysts	Analytes Reported	Laboratory
		SM 2320B	MWD	1	PASI-M
		SM 2540C	PH1	1	PASI-M
10160707009	**HM-SD-01**	EPA 6020	CJS, RJS	12	PASI-M
		EPA 7471	TEM	1	PASI-M
		% Moisture	JDL	1	PASI-M

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PROJECT NARRATIVE

Project: Black Pine Mine
Pace Project No.: 10160707

Method: **EPA 200.8**
Description: 200.8 MET ICPMS
Client: Montana Dept. of Environmental Quality
Date: July 01, 2011

General Information:
5 samples were analyzed for EPA 200.8. All samples were received in acceptable condition with any exceptions noted below.

Hold Time:
The samples were analyzed within the method required hold times with any exceptions noted below.

Sample Preparation:
The samples were prepared in accordance with EPA 200.8 with any exceptions noted below.

Initial Calibrations (including MS Tune as applicable):
All criteria were within method requirements with any exceptions noted below.

Continuing Calibration:
All criteria were within method requirements with any exceptions noted below.

Internal Standards:
All internal standards were within QC limits with any exceptions noted below.

Method Blank:
All analytes were below the report limit in the method blank with any exceptions noted below.

Laboratory Control Spike:
All laboratory control spike compounds were within QC limits with any exceptions noted below.

Matrix Spikes:
All percent recoveries and relative percent differences (RPDs) were within acceptance criteria with any exceptions noted below.

QC Batch: MPRP/26726

A matrix spike and matrix spike duplicate (MS/MSD) were performed on the following sample(s): 10160655001,10160673004

M1: Matrix spike recovery exceeded QC limits. Batch accepted based on laboratory control sample (LCS) recovery.

- MS (Lab ID: 998292)
  - Iron
- MS (Lab ID: 998294)
  - Iron
- MSD (Lab ID: 998293)
  - Iron

Duplicate Sample:
All duplicate sample results were within method acceptance criteria with any exceptions noted below.

Additional Comments:

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PROJECT NARRATIVE

Project: Black Pine Mine
Pace Project No.: 10160707

Method: **EPA 6020**
Description: 6020 MET ICPMS
Client: Montana Dept. of Environmental Quality
Date: July 01, 2011

General Information:
4 samples were analyzed for EPA 6020. All samples were received in acceptable condition with any exceptions noted below.

Hold Time:
The samples were analyzed within the method required hold times with any exceptions noted below.

Sample Preparation:
The samples were prepared in accordance with EPA 3050 with any exceptions noted below.

Initial Calibrations (including MS Tune as applicable):
All criteria were within method requirements with any exceptions noted below.

Continuing Calibration:
All criteria were within method requirements with any exceptions noted below.

Internal Standards:
All internal standards were within QC limits with any exceptions noted below.

Method Blank:
All analytes were below the report limit in the method blank with any exceptions noted below.

Laboratory Control Spike:
All laboratory control spike compounds were within QC limits with any exceptions noted below.

Matrix Spikes:
All percent recoveries and relative percent differences (RPDs) were within acceptance criteria with any exceptions noted below.

QC Batch: MPRP/26729

A matrix spike and matrix spike duplicate (MS/MSD) were performed on the following sample(s): 10160673001,10160673014

M6: Matrix spike and Matrix spike duplicate recovery not evaluated against control limits due to sample dilution.

- MS (Lab ID: 998306)
  - Barium
  - Copper
  - Iron
  - Lead
  - Manganese
  - Zinc
- MS (Lab ID: 998308)
  - Antimony
  - Barium
  - Chromium
  - Iron
  - Lead
  - Manganese

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PROJECT NARRATIVE

Project: Black Pine Mine
Pace Project No.: 10160707

Method: **EPA 6020**
Description: 6020 MET ICPMS
Client: Montana Dept. of Environmental Quality
Date: July 01, 2011

QC Batch: MPRP/26729

A matrix spike and matrix spike duplicate (MS/MSD) were performed on the following sample(s): 10160673001,10160673014

M6: Matrix spike and Matrix spike duplicate recovery not evaluated against control limits due to sample dilution.

- Zinc

- MSD (Lab ID: 998307)
  - Barium
  - Iron
  - Lead
  - Manganese
  - Zinc

Duplicate Sample:
All duplicate sample results were within method acceptance criteria with any exceptions noted below.

Additional Comments:

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PROJECT NARRATIVE

Project: Black Pine Mine
Pace Project No.: 10160707

Method: **EPA 7471**
Description: 7471 Mercury
Client: Montana Dept. of Environmental Quality
Date: July 01, 2011

General Information:
4 samples were analyzed for EPA 7471. All samples were received in acceptable condition with any exceptions noted below.

Hold Time:
The samples were analyzed within the method required hold times with any exceptions noted below.

Sample Preparation:
The samples were prepared in accordance with EPA 7471 with any exceptions noted below.

Initial Calibrations (including MS Tune as applicable):
All criteria were within method requirements with any exceptions noted below.

Continuing Calibration:
All criteria were within method requirements with any exceptions noted below.

Method Blank:
All analytes were below the report limit in the method blank with any exceptions noted below.

Laboratory Control Spike:
All laboratory control spike compounds were within QC limits with any exceptions noted below.

Matrix Spikes:
All percent recoveries and relative percent differences (RPDs) were within acceptance criteria with any exceptions noted below.

QC Batch: MERP/5542

A matrix spike and matrix spike duplicate (MS/MSD) were performed on the following sample(s): 10160673001,10160707009

M6: Matrix spike and Matrix spike duplicate recovery not evaluated against control limits due to sample dilution.

- MS (Lab ID: 999062)
  - Mercury
- MS (Lab ID: 999064)
  - Mercury
- MSD (Lab ID: 999063)
  - Mercury

Duplicate Sample:
All duplicate sample results were within method acceptance criteria with any exceptions noted below.

Additional Comments:

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PROJECT NARRATIVE

Project: Black Pine Mine
Pace Project No.: 10160707

Method: **SM 2310**
Description: 2310 Acidity
Client: Montana Dept. of Environmental Quality
Date: July 01, 2011

General Information:
5 samples were analyzed for SM 2310. All samples were received in acceptable condition with any exceptions noted below.

Hold Time:
The samples were analyzed within the method required hold times with any exceptions noted below.

Initial Calibrations (including MS Tune as applicable):
All criteria were within method requirements with any exceptions noted below.

Continuing Calibration:
All criteria were within method requirements with any exceptions noted below.

Internal Standards:
All internal standards were within QC limits with any exceptions noted below.

Surrogates:
All surrogates were within QC limits with any exceptions noted below.

Method Blank:
All analytes were below the report limit in the method blank with any exceptions noted below.

Laboratory Control Spike:
All laboratory control spike compounds were within QC limits with any exceptions noted below.

Matrix Spikes:
All percent recoveries and relative percent differences (RPDs) were within acceptance criteria with any exceptions noted below.

Duplicate Sample:
All duplicate sample results were within method acceptance criteria with any exceptions noted below.

Additional Comments:

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PROJECT NARRATIVE

Project: Black Pine Mine
Pace Project No.: 10160707

Method: **SM 2540D**
Description: 2540D Total Suspended Solids
Client: Montana Dept. of Environmental Quality
Date: July 01, 2011

General Information:
5 samples were analyzed for SM 2540D. All samples were received in acceptable condition with any exceptions noted below.

Hold Time:
The samples were analyzed within the method required hold times with any exceptions noted below.

Initial Calibrations (including MS Tune as applicable):
All criteria were within method requirements with any exceptions noted below.

Continuing Calibration:
All criteria were within method requirements with any exceptions noted below.

Internal Standards:
All internal standards were within QC limits with any exceptions noted below.

Surrogates:
All surrogates were within QC limits with any exceptions noted below.

Method Blank:
All analytes were below the report limit in the method blank with any exceptions noted below.

Laboratory Control Spike:
All laboratory control spike compounds were within QC limits with any exceptions noted below.

Matrix Spikes:
All percent recoveries and relative percent differences (RPDs) were within acceptance criteria with any exceptions noted below.

Duplicate Sample:
All duplicate sample results were within method acceptance criteria with any exceptions noted below.

Additional Comments:

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PROJECT NARRATIVE

Project: Black Pine Mine
Pace Project No.: 10160707

Method: **EPA 300.0**
Description: 300.0 IC Anions
Client: Montana Dept. of Environmental Quality
Date: July 01, 2011

General Information:
5 samples were analyzed for EPA 300.0. All samples were received in acceptable condition with any exceptions noted below.

Hold Time:
The samples were analyzed within the method required hold times with any exceptions noted below.

Initial Calibrations (including MS Tune as applicable):
All criteria were within method requirements with any exceptions noted below.

Continuing Calibration:
All criteria were within method requirements with any exceptions noted below.

Internal Standards:
All internal standards were within QC limits with any exceptions noted below.

Surrogates:
All surrogates were within QC limits with any exceptions noted below.

Method Blank:
All analytes were below the report limit in the method blank with any exceptions noted below.

Laboratory Control Spike:
All laboratory control spike compounds were within QC limits with any exceptions noted below.

Matrix Spikes:
All percent recoveries and relative percent differences (RPDs) were within acceptance criteria with any exceptions noted below.

Duplicate Sample:
All duplicate sample results were within method acceptance criteria with any exceptions noted below.

Additional Comments:

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PROJECT NARRATIVE

Project: Black Pine Mine
Pace Project No.: 10160707

Method: **SM 2320B**
Description: 2320B Alkalinity
Client: Montana Dept. of Environmental Quality
Date: July 01, 2011

General Information:
5 samples were analyzed for SM 2320B. All samples were received in acceptable condition with any exceptions noted below.

Hold Time:
The samples were analyzed within the method required hold times with any exceptions noted below.

Method Blank:
All analytes were below the report limit in the method blank with any exceptions noted below.

Laboratory Control Spike:
All laboratory control spike compounds were within QC limits with any exceptions noted below.

Matrix Spikes:
All percent recoveries and relative percent differences (RPDs) were within acceptance criteria with any exceptions noted below.

QC Batch: WET/22674

A matrix spike and matrix spike duplicate (MS/MSD) were performed on the following sample(s): 10160707001,10160722002

M1: Matrix spike recovery exceeded QC limits. Batch accepted based on laboratory control sample (LCS) recovery.

- MS (Lab ID: 998343)
  - Alkalinity, Total as CaCO3
- MSD (Lab ID: 998344)
  - Alkalinity, Total as CaCO3

Duplicate Sample:
All duplicate sample results were within method acceptance criteria with any exceptions noted below.

Additional Comments:

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PROJECT NARRATIVE

Project: Black Pine Mine
Pace Project No.: 10160707

Method: **SM 2540C**
Description: 2540C Total Dissolved Solids
Client: Montana Dept. of Environmental Quality
Date: July 01, 2011

General Information:
5 samples were analyzed for SM 2540C. All samples were received in acceptable condition with any exceptions noted below.

Hold Time:
The samples were analyzed within the method required hold times with any exceptions noted below.

Method Blank:
All analytes were below the report limit in the method blank with any exceptions noted below.

Laboratory Control Spike:
All laboratory control spike compounds were within QC limits with any exceptions noted below.

Matrix Spikes:
All percent recoveries and relative percent differences (RPDs) were within acceptance criteria with any exceptions noted below.

Duplicate Sample:
All duplicate sample results were within method acceptance criteria with any exceptions noted below.

Additional Comments:

This data package has been reviewed for quality and completeness and is approved for release.

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ANALYTICAL RESULTS

Project: Black Pine Mine
Pace Project No.: 10160707

Sample: TSP-8 **Lab ID: 10160707001** Collected: 06/13/11 16:45 Received: 06/17/11 08:50 Matrix: Water

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
200.8 MET ICPMS	Analytical Method: EPA 200.8 Preparation Method: EPA 200.8							
Antimony	**1.2**	ug/L	0.50	1	06/28/11 15:18	06/30/11 07:12	7440-36-0	
Arsenic	**1.7**	ug/L	0.50	1	06/28/11 15:18	06/30/11 07:12	7440-38-2	
Barium	**83.5**	ug/L	0.30	1	06/28/11 15:18	06/30/11 07:12	7440-39-3	
Cadmium	**0.28**	ug/L	0.080	1	06/28/11 15:18	06/30/11 07:12	7440-43-9	
Chromium	**2.3**	ug/L	0.50	1	06/28/11 15:18	06/30/11 07:12	7440-47-3	
Copper	**24.2**	ug/L	0.50	1	06/28/11 15:18	06/30/11 07:12	7440-50-8	
Iron	**2130**	ug/L	50.0	1	06/28/11 15:18	06/30/11 07:12	7439-89-6	
Lead	**1.8**	ug/L	0.10	1	06/28/11 15:18	06/30/11 07:12	7439-92-1	
Manganese	**13.6**	ug/L	0.50	1	06/28/11 15:18	06/30/11 07:12	7439-96-5	
Nickel	**3.4**	ug/L	0.50	1	06/28/11 15:18	06/30/11 07:12	7440-02-0	
Silver	**<0.50**	ug/L	0.50	1	06/28/11 15:18	06/30/11 15:05	7440-22-4	
Zinc	**22.3**	ug/L	5.0	1	06/28/11 15:18	06/30/11 07:12	7440-66-6	
2310 Acidity	Analytical Method: SM 2310							
Acidity	**12.0**	mg/L	5.0	1		06/24/11 16:00		
2540D Total Suspended Solids	Analytical Method: SM 2540D							
Total Suspended Solids	**1.5**	mg/L	1.0	1		06/20/11 10:40		
300.0 IC Anions	Analytical Method: EPA 300.0							
Sulfate	**10.1**	mg/L	2.0	2		06/26/11 22:57	14808-79-8	
2320B Alkalinity	Analytical Method: SM 2320B							
Alkalinity, Total as CaCO3	**13.4**	mg/L	5.0	1		06/20/11 11:18		
2540C Total Dissolved Solids	Analytical Method: SM 2540C							
Total Dissolved Solids	**125**	mg/L	10.0	1		06/20/11 12:03		

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ANALYTICAL RESULTS

Project: Black Pine Mine
Pace Project No.: 10160707

Sample: BP-TS-SD-01-00 **Lab ID: 10160707002** Collected: 06/13/11 16:55 Received: 06/17/11 08:50 Matrix: Solid

Results reported on a "dry-weight" basis

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
6020 MET ICPMS	Analytical Method: EPA 6020 Preparation Method: EPA 3050							
Antimony	**37.2**	mg/kg	1.4	20	06/28/11 17:42	06/29/11 20:07	7440-36-0	
Arsenic	**31.1**	mg/kg	1.4	20	06/28/11 17:42	06/29/11 20:07	7440-38-2	
Barium	**266**	mg/kg	4.1	100	06/28/11 17:42	07/01/11 12:54	7440-39-3	
Cadmium	**9.1**	mg/kg	0.22	20	06/28/11 17:42	06/29/11 20:07	7440-43-9	
Chromium	**10.7**	mg/kg	1.4	20	06/28/11 17:42	06/29/11 20:07	7440-47-3	
Copper	**639**	mg/kg	1.4	20	06/28/11 17:42	06/29/11 20:07	7440-50-8	
Iron	**10100**	mg/kg	137	20	06/28/11 17:42	06/29/11 20:07	7439-89-6	
Lead	**110**	mg/kg	1.4	100	06/28/11 17:42	07/01/11 12:54	7439-92-1	
Manganese	**1140**	mg/kg	1.4	20	06/28/11 17:42	06/29/11 20:07	7439-96-5	
Nickel	**24.5**	mg/kg	1.4	20	06/28/11 17:42	06/29/11 20:07	7440-02-0	
Silver	**6.1**	mg/kg	1.4	20	06/28/11 17:42	06/29/11 20:07	7440-22-4	
Zinc	**236**	mg/kg	13.7	20	06/28/11 17:42	06/29/11 20:07	7440-66-6	
7471 Mercury	Analytical Method: EPA 7471 Preparation Method: EPA 7471							
Mercury	**0.23**	mg/kg	0.059	1	06/29/11 16:02	06/30/11 10:16	7439-97-6	
Dry Weight	Analytical Method: % Moisture							
Percent Moisture	**65.9**	%	0.10	1		06/27/11 00:00		

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ANALYTICAL RESULTS

Project: Black Pine Mine
Pace Project No.: 10160707

Sample: CML-SW-06 **Lab ID: 10160707003** Collected: 06/13/11 16:30 Received: 06/17/11 08:50 Matrix: Water

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
200.8 MET ICPMS	Analytical Method: EPA 200.8 Preparation Method: EPA 200.8							
Antimony	**117**	ug/L	0.50	1	06/28/11 15:18	06/30/11 07:17	7440-36-0	
Arsenic	**36.0**	ug/L	0.50	1	06/28/11 15:18	06/30/11 07:17	7440-38-2	
Barium	**59.2**	ug/L	0.30	1	06/28/11 15:18	06/30/11 07:17	7440-39-3	
Cadmium	**1.1**	ug/L	0.080	1	06/28/11 15:18	06/30/11 07:17	7440-43-9	
Chromium	**1.0**	ug/L	0.50	1	06/28/11 15:18	06/30/11 07:17	7440-47-3	
Copper	**133**	ug/L	0.50	1	06/28/11 15:18	06/30/11 07:17	7440-50-8	
Iron	**117**	ug/L	50.0	1	06/28/11 15:18	06/30/11 07:17	7439-89-6	
Lead	**6.7**	ug/L	0.10	1	06/28/11 15:18	06/30/11 07:17	7439-92-1	
Manganese	**39.1**	ug/L	0.50	1	06/28/11 15:18	06/30/11 07:17	7439-96-5	
Nickel	**3.2**	ug/L	0.50	1	06/28/11 15:18	06/30/11 07:17	7440-02-0	
Silver	**<0.50**	ug/L	0.50	1	06/28/11 15:18	06/30/11 15:22	7440-22-4	
Zinc	**63.1**	ug/L	5.0	1	06/28/11 15:18	06/30/11 07:17	7440-66-6	
2310 Acidity	Analytical Method: SM 2310							
Acidity	**<5.0**	mg/L	5.0	1		06/24/11 16:00		
2540D Total Suspended Solids	Analytical Method: SM 2540D							
Total Suspended Solids	**2.4**	mg/L	1.0	1		06/20/11 10:40		
300.0 IC Anions	Analytical Method: EPA 300.0							
Sulfate	**60.0**	mg/L	2.0	2		06/26/11 23:26	14808-79-8	
2320B Alkalinity	Analytical Method: SM 2320B							
Alkalinity, Total as CaCO3	**52.5**	mg/L	5.0	1		06/20/11 11:31		
2540C Total Dissolved Solids	Analytical Method: SM 2540C							
Total Dissolved Solids	**148**	mg/L	10.0	1		06/20/11 12:04		

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ANALYTICAL RESULTS

Project: Black Pine Mine
Pace Project No.: 10160707

Sample: CML-SD-06-00 **Lab ID: 10160707004** Collected: 06/13/11 16:35 Received: 06/17/11 08:50 Matrix: Solid

Results reported on a "dry-weight" basis

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
6020 MET ICPMS	Analytical Method: EPA 6020 Preparation Method: EPA 3050							
Antimony	**891**	mg/kg	1.1	20	06/28/11 17:42	06/29/11 20:11	7440-36-0	
Arsenic	**642**	mg/kg	1.1	20	06/28/11 17:42	06/29/11 20:11	7440-38-2	
Barium	**353**	mg/kg	31.7	1000	06/28/11 17:42	07/01/11 12:58	7440-39-3	
Cadmium	**28.6**	mg/kg	0.17	20	06/28/11 17:42	06/29/11 20:11	7440-43-9	
Chromium	**8.2**	mg/kg	1.1	20	06/28/11 17:42	06/29/11 20:11	7440-47-3	
Copper	**3620**	mg/kg	52.9	1000	06/28/11 17:42	07/01/11 12:58	7440-50-8	
Iron	**21200**	mg/kg	106	20	06/28/11 17:42	06/29/11 20:11	7439-89-6	
Lead	**3760**	mg/kg	10.6	1000	06/28/11 17:42	07/01/11 12:58	7439-92-1	
Manganese	**602**	mg/kg	1.1	20	06/28/11 17:42	06/29/11 20:11	7439-96-5	
Nickel	**14.6**	mg/kg	1.1	20	06/28/11 17:42	06/29/11 20:11	7440-02-0	
Silver	**64.6**	mg/kg	1.1	20	06/28/11 17:42	06/29/11 20:11	7440-22-4	
Zinc	**768**	mg/kg	10.6	20	06/28/11 17:42	06/29/11 20:11	7440-66-6	
7471 Mercury	Analytical Method: EPA 7471 Preparation Method: EPA 7471							
Mercury	**32.8**	mg/kg	0.91	20	06/29/11 16:02	06/30/11 10:45	7439-97-6	
Dry Weight	Analytical Method: % Moisture							
Percent Moisture	**55.8**	%	0.10	1		06/27/11 00:00		

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ANALYTICAL RESULTS

Project: Black Pine Mine
Pace Project No.: 10160707

Sample: TSP-3 **Lab ID: 10160707005** Collected: 06/13/11 15:30 Received: 06/17/11 08:50 Matrix: Water

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
200.8 MET ICPMS	Analytical Method: EPA 200.8 Preparation Method: EPA 200.8							
Antimony	**0.53**	ug/L	0.50	1	06/28/11 15:18	06/30/11 07:21	7440-36-0	
Arsenic	**1.2**	ug/L	0.50	1	06/28/11 15:18	06/30/11 07:21	7440-38-2	
Barium	**85.1**	ug/L	0.30	1	06/28/11 15:18	06/30/11 07:21	7440-39-3	
Cadmium	**0.14**	ug/L	0.080	1	06/28/11 15:18	06/30/11 07:21	7440-43-9	
Chromium	**1.7**	ug/L	0.50	1	06/28/11 15:18	06/30/11 07:21	7440-47-3	
Copper	**30.5**	ug/L	0.50	1	06/28/11 15:18	06/30/11 07:21	7440-50-8	
Iron	**1180**	ug/L	50.0	1	06/28/11 15:18	06/30/11 07:21	7439-89-6	
Lead	**0.86**	ug/L	0.10	1	06/28/11 15:18	06/30/11 07:21	7439-92-1	
Manganese	**11.5**	ug/L	0.50	1	06/28/11 15:18	06/30/11 07:21	7439-96-5	
Nickel	**2.1**	ug/L	0.50	1	06/28/11 15:18	06/30/11 07:21	7440-02-0	
Silver	**<0.50**	ug/L	0.50	1	06/28/11 15:18	06/30/11 15:25	7440-22-4	
Zinc	**10.4**	ug/L	5.0	1	06/28/11 15:18	06/30/11 07:21	7440-66-6	
2310 Acidity	Analytical Method: SM 2310							
Acidity	**8.2**	mg/L	5.0	1		06/24/11 16:00		
2540D Total Suspended Solids	Analytical Method: SM 2540D							
Total Suspended Solids	**3.1**	mg/L	1.0	1		06/20/11 10:40		
300.0 IC Anions	Analytical Method: EPA 300.0							
Sulfate	**4.9**	mg/L	2.0	2		06/26/11 23:54	14808-79-8	
2320B Alkalinity	Analytical Method: SM 2320B							
Alkalinity, Total as CaCO3	**11.9**	mg/L	5.0	1		06/20/11 11:35		
2540C Total Dissolved Solids	Analytical Method: SM 2540C							
Total Dissolved Solids	**80.0**	mg/L	10.0	1		06/20/11 11:19		

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ANALYTICAL RESULTS

Project: Black Pine Mine
Pace Project No.: 10160707

Sample: BP-TS-SD-02-00 **Lab ID: 10160707006** Collected: 06/13/11 15:40 Received: 06/17/11 08:50 Matrix: Solid

Results reported on a "dry-weight" basis

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
6020 MET ICPMS	Analytical Method: EPA 6020 Preparation Method: EPA 3050							
Antimony	**3.2**	mg/kg	1.5	20	06/28/11 17:42	06/29/11 20:16	7440-36-0	
Arsenic	**22.4**	mg/kg	1.5	20	06/28/11 17:42	06/29/11 20:16	7440-38-2	
Barium	**635**	mg/kg	4.6	100	06/28/11 17:42	07/01/11 13:03	7440-39-3	
Cadmium	**1.1**	mg/kg	0.24	20	06/28/11 17:42	06/29/11 20:16	7440-43-9	
Chromium	**16.0**	mg/kg	1.5	20	06/28/11 17:42	06/29/11 20:16	7440-47-3	
Copper	**50.9**	mg/kg	1.5	20	06/28/11 17:42	06/29/11 20:16	7440-50-8	
Iron	**24700**	mg/kg	153	20	06/28/11 17:42	06/29/11 20:16	7439-89-6	
Lead	**65.2**	mg/kg	1.5	100	06/28/11 17:42	07/01/11 13:03	7439-92-1	
Manganese	**947**	mg/kg	1.5	20	06/28/11 17:42	06/29/11 20:16	7439-96-5	
Nickel	**20.0**	mg/kg	1.5	20	06/28/11 17:42	06/29/11 20:16	7440-02-0	
Silver	**<1.5**	mg/kg	1.5	20	06/28/11 17:42	06/29/11 20:16	7440-22-4	
Zinc	**117**	mg/kg	15.3	20	06/28/11 17:42	06/29/11 20:16	7440-66-6	
7471 Mercury	Analytical Method: EPA 7471 Preparation Method: EPA 7471							
Mercury	**24.4**	mg/kg	1.1	20	06/29/11 16:02	06/30/11 10:47	7439-97-6	
Dry Weight	Analytical Method: % Moisture							
Percent Moisture	**68.9**	%	0.10	1		06/27/11 00:00		

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ANALYTICAL RESULTS

Project: Black Pine Mine
Pace Project No.: 10160707

Sample: TSP-9 **Lab ID: 10160707007** Collected: 06/13/11 17:30 Received: 06/17/11 08:50 Matrix: Water

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
200.8 MET ICPMS	Analytical Method: EPA 200.8 Preparation Method: EPA 200.8							
Antimony	**0.57**	ug/L	0.50	1	06/28/11 15:18	06/30/11 07:26	7440-36-0	
Arsenic	**1.7**	ug/L	0.50	1	06/28/11 15:18	06/30/11 07:26	7440-38-2	
Barium	**86.7**	ug/L	0.30	1	06/28/11 15:18	06/30/11 07:26	7440-39-3	
Cadmium	**0.25**	ug/L	0.080	1	06/28/11 15:18	06/30/11 07:26	7440-43-9	
Chromium	**2.9**	ug/L	0.50	1	06/28/11 15:18	06/30/11 07:26	7440-47-3	
Copper	**8.9**	ug/L	0.50	1	06/28/11 15:18	06/30/11 07:26	7440-50-8	
Iron	**2780**	ug/L	50.0	1	06/28/11 15:18	06/30/11 07:26	7439-89-6	
Lead	**1.5**	ug/L	0.10	1	06/28/11 15:18	06/30/11 07:26	7439-92-1	
Manganese	**18.8**	ug/L	0.50	1	06/28/11 15:18	06/30/11 07:26	7439-96-5	
Nickel	**4.2**	ug/L	0.50	1	06/28/11 15:18	06/30/11 07:26	7440-02-0	
Silver	**<0.50**	ug/L	0.50	1	06/28/11 15:18	06/30/11 15:29	7440-22-4	
Zinc	**19.0**	ug/L	5.0	1	06/28/11 15:18	06/30/11 07:26	7440-66-6	
2310 Acidity	Analytical Method: SM 2310							
Acidity	**13.9**	mg/L	5.0	1		06/24/11 16:00		
2540D Total Suspended Solids	Analytical Method: SM 2540D							
Total Suspended Solids	**4.1**	mg/L	1.0	1		06/20/11 10:40		
300.0 IC Anions	Analytical Method: EPA 300.0							
Sulfate	**4.1**	mg/L	2.0	2		06/27/11 00:23	14808-79-8	
2320B Alkalinity	Analytical Method: SM 2320B							
Alkalinity, Total as CaCO3	**15.2**	mg/L	5.0	1		06/20/11 11:38		
2540C Total Dissolved Solids	Analytical Method: SM 2540C							
Total Dissolved Solids	**122**	mg/L	10.0	1		06/20/11 11:20		

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ANALYTICAL RESULTS

Project: Black Pine Mine
Pace Project No.: 10160707

Sample: MCSP-1 **Lab ID: 10160707008** Collected: 06/13/11 14:40 Received: 06/17/11 08:50 Matrix: Water

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
200.8 MET ICPMS	Analytical Method: EPA 200.8 Preparation Method: EPA 200.8							
Antimony	**1.4**	ug/L	0.50	1	06/28/11 15:18	06/30/11 07:30	7440-36-0	
Arsenic	**1.6**	ug/L	0.50	1	06/28/11 15:18	06/30/11 07:30	7440-38-2	
Barium	**65.7**	ug/L	0.30	1	06/28/11 15:18	06/30/11 07:30	7440-39-3	
Cadmium	**0.26**	ug/L	0.080	1	06/28/11 15:18	06/30/11 07:30	7440-43-9	
Chromium	**1.5**	ug/L	0.50	1	06/28/11 15:18	06/30/11 07:30	7440-47-3	
Copper	**107**	ug/L	0.50	1	06/28/11 15:18	06/30/11 07:30	7440-50-8	
Iron	**1080**	ug/L	50.0	1	06/28/11 15:18	06/30/11 07:30	7439-89-6	
Lead	**2.9**	ug/L	0.10	1	06/28/11 15:18	06/30/11 07:30	7439-92-1	
Manganese	**15.4**	ug/L	0.50	1	06/28/11 15:18	06/30/11 07:30	7439-96-5	
Nickel	**2.3**	ug/L	0.50	1	06/28/11 15:18	06/30/11 07:30	7440-02-0	
Silver	**<0.50**	ug/L	0.50	1	06/28/11 15:18	06/30/11 15:32	7440-22-4	
Zinc	**31.4**	ug/L	5.0	1	06/28/11 15:18	06/30/11 07:30	7440-66-6	
2310 Acidity	Analytical Method: SM 2310							
Acidity	**25.2**	mg/L	5.0	1		06/24/11 16:00		
2540D Total Suspended Solids	Analytical Method: SM 2540D							
Total Suspended Solids	**5.3**	mg/L	1.0	1		06/20/11 10:40		
300.0 IC Anions	Analytical Method: EPA 300.0							
Sulfate	**11.4**	mg/L	2.0	2		06/27/11 00:51	14808-79-8	
2320B Alkalinity	Analytical Method: SM 2320B							
Alkalinity, Total as CaCO3	**8.9**	mg/L	5.0	1		06/20/11 11:42		
2540C Total Dissolved Solids	Analytical Method: SM 2540C							
Total Dissolved Solids	**105**	mg/L	10.0	1		06/20/11 11:20		

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ANALYTICAL RESULTS

Project: Black Pine Mine
Pace Project No.: 10160707

Sample: HM-SD-01 **Lab ID: 10160707009** Collected: 06/13/11 14:45 Received: 06/17/11 08:50 Matrix: Solid

Results reported on a "dry-weight" basis

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
6020 MET ICPMS	Analytical Method: EPA 6020 Preparation Method: EPA 3050							
Antimony	**20.0**	mg/kg	1.4	20	06/28/11 17:42	06/29/11 20:25	7440-36-0	
Arsenic	**24.8**	mg/kg	1.4	20	06/28/11 17:42	06/29/11 20:25	7440-38-2	
Barium	**752**	mg/kg	4.1	100	06/28/11 17:42	07/01/11 13:07	7440-39-3	
Cadmium	**4.9**	mg/kg	0.22	20	06/28/11 17:42	06/29/11 20:25	7440-43-9	
Chromium	**20.7**	mg/kg	1.4	20	06/28/11 17:42	06/29/11 20:25	7440-47-3	
Copper	**2780**	mg/kg	6.8	100	06/28/11 17:42	07/01/11 13:07	7440-50-8	
Iron	**21400**	mg/kg	135	20	06/28/11 17:42	06/29/11 20:25	7439-89-6	
Lead	**305**	mg/kg	1.4	100	06/28/11 17:42	07/01/11 13:07	7439-92-1	
Manganese	**2780**	mg/kg	6.8	100	06/28/11 17:42	07/01/11 13:07	7439-96-5	
Nickel	**26.8**	mg/kg	1.4	20	06/28/11 17:42	06/29/11 20:25	7440-02-0	
Silver	**3.4**	mg/kg	1.4	20	06/28/11 17:42	06/29/11 20:25	7440-22-4	
Zinc	**272**	mg/kg	13.5	20	06/28/11 17:42	06/29/11 20:25	7440-66-6	
7471 Mercury	Analytical Method: EPA 7471 Preparation Method: EPA 7471							
Mercury	**27.4**	mg/kg	1.0	20	06/29/11 16:02	06/30/11 10:49	7439-97-6	M6
Dry Weight	Analytical Method: % Moisture							
Percent Moisture	**65.2**	%	0.10	1		06/27/11 00:00		

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QUALITY CONTROL DATA

Project: Black Pine Mine
Pace Project No.: 10160707

QC Batch: MPRP/26726 Analysis Method: EPA 200.8
QC Batch Method: EPA 200.8 Analysis Description: 200.8 MET
Associated Lab Samples: 10160707001, 10160707003, 10160707005, 10160707007, 10160707008

METHOD BLANK: 998290 Matrix: Water
Associated Lab Samples: 10160707001, 10160707003, 10160707005, 10160707007, 10160707008

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Antimony	ug/L	<0.50	0.50	06/30/11 06:01	
Arsenic	ug/L	<0.50	0.50	06/30/11 06:01	
Barium	ug/L	<0.30	0.30	06/30/11 06:01	
Cadmium	ug/L	<0.080	0.080	06/30/11 06:01	
Chromium	ug/L	<0.50	0.50	06/30/11 06:01	
Copper	ug/L	<0.50	0.50	06/30/11 06:01	
Iron	ug/L	<50.0	50.0	06/30/11 06:01	
Lead	ug/L	<0.10	0.10	06/30/11 06:01	
Manganese	ug/L	<0.50	0.50	06/30/11 06:01	
Nickel	ug/L	<0.50	0.50	06/30/11 06:01	
Silver	ug/L	<0.50	0.50	06/30/11 06:01	
Zinc	ug/L	<5.0	5.0	06/30/11 06:01	

LABORATORY CONTROL SAMPLE: 998291

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Antimony	ug/L	80	79.8	100	85-115	
Arsenic	ug/L	80	82.4	103	85-115	
Barium	ug/L	80	81.9	102	85-115	
Cadmium	ug/L	80	81.5	102	85-115	
Chromium	ug/L	80	81.8	102	85-115	
Copper	ug/L	80	85.5	107	85-115	
Iron	ug/L	1000	1020	102	85-115	
Lead	ug/L	80	81.7	102	85-115	
Manganese	ug/L	80	82.0	102	85-115	
Nickel	ug/L	80	79.6	99	85-115	
Silver	ug/L	80	86.3	108	85-115	
Zinc	ug/L	80	77.7	97	85-115	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 998292 998293

Parameter	Units	10160655001 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Antimony	ug/L	42.9	80	80	125	128	103	106	70-130	2	20	
Arsenic	ug/L	12.8	80	80	95.3	95.4	103	103	70-130	.1	20	
Barium	ug/L	81.7	80	80	170	170	111	110	70-130	.5	20	
Cadmium	ug/L	1.2	80	80	84.3	82.5	104	102	70-130	2	20	
Chromium	ug/L	1.3	80	80	85.1	84.1	105	104	70-130	1	20	
Copper	ug/L	221	80	80	314	311	116	114	70-130	.7	20	
Iron	ug/L	1430	1000	1000	2810	2900	138	147	70-130	3	20	M1

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QUALITY CONTROL DATA

Project: Black Pine Mine
Pace Project No.: 10160707

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 998292 998293

Parameter	Units	10160655001 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Lead	ug/L	49.0	80	80	133	134	104	106	70-130	.8	20	
Manganese	ug/L	12.9	80	80	96.2	96.9	104	105	70-130	.7	20	
Nickel	ug/L	2.1	80	80	81.6	81.0	99	99	70-130	.8	20	
Silver	ug/L	0.64	80	80	80.9	84.1	100	104	70-130	4	20	
Zinc	ug/L	40.5	80	80	122	120	101	99	70-130	2	20	

MATRIX SPIKE SAMPLE: 998294

Parameter	Units	10160673004 Result	Spike Conc.	MS Result	MS % Rec	% Rec Limits	Qualifiers
Antimony	ug/L	0.53	80	78.9	98	70-130	
Arsenic	ug/L	1.1	80	82.3	101	70-130	
Barium	ug/L	85.4	80	169	104	70-130	
Cadmium	ug/L	<0.080	80	80.3	100	70-130	
Chromium	ug/L	1.3	80	83.0	102	70-130	
Copper	ug/L	22.5	80	106	104	70-130	
Iron	ug/L	1000	1000	2310	131	70-130	M1
Lead	ug/L	0.97	80	81.2	100	70-130	
Manganese	ug/L	8.9	80	89.0	100	70-130	
Nickel	ug/L	2.2	80	79.7	97	70-130	
Silver	ug/L	<0.50	80	78.7	98	70-130	
Zinc	ug/L	8.2	80	85.9	97	70-130	

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QUALITY CONTROL DATA

Project: Black Pine Mine
Pace Project No.: 10160707

QC Batch: MPRP/26729 Analysis Method: EPA 6020
QC Batch Method: EPA 3050 Analysis Description: 6020 MET
Associated Lab Samples: 10160707002, 10160707004, 10160707006, 10160707009

METHOD BLANK: 998304 Matrix: Solid
Associated Lab Samples: 10160707002, 10160707004, 10160707006, 10160707009

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Antimony	mg/kg	<0.41	0.41	06/29/11 18:04	
Arsenic	mg/kg	<0.41	0.41	06/29/11 18:04	
Barium	mg/kg	<0.25	0.25	06/29/11 18:04	
Cadmium	mg/kg	<0.066	0.066	06/29/11 18:04	
Chromium	mg/kg	<0.41	0.41	06/29/11 18:04	
Copper	mg/kg	<0.41	0.41	06/29/11 18:04	
Iron	mg/kg	<41.3	41.3	06/29/11 18:04	
Lead	mg/kg	<0.083	0.083	07/01/11 11:24	
Manganese	mg/kg	<0.41	0.41	06/29/11 18:04	
Nickel	mg/kg	<0.41	0.41	06/29/11 18:04	
Silver	mg/kg	<0.41	0.41	06/29/11 18:04	
Zinc	mg/kg	<4.1	4.1	06/29/11 18:04	

LABORATORY CONTROL SAMPLE: 998305

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Antimony	mg/kg	17.9	18.5	103	75-125	
Arsenic	mg/kg	17.9	19.0	106	75-125	
Barium	mg/kg	17.9	19.5	109	75-125	
Cadmium	mg/kg	17.9	19.1	107	75-125	
Chromium	mg/kg	17.9	19.5	109	75-125	
Copper	mg/kg	17.9	20.1	113	75-125	
Iron	mg/kg	223	248	111	75-125	
Lead	mg/kg	17.9	19.5	109	75-125	
Manganese	mg/kg	17.9	19.8	111	75-125	
Nickel	mg/kg	17.9	20.1	113	75-125	
Silver	mg/kg	17.9	20.5	115	75-125	
Zinc	mg/kg	17.9	19.7	110	75-125	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 998306 998307

Parameter	Units	10160673001 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Antimony	mg/kg	16.7	43.1	54.2	51.5	63.1	81	85	75-125	20	20	
Arsenic	mg/kg	27.9	43.1	54.2	72.3	84.9	103	105	75-125	16	20	
Barium	mg/kg	335	43.1	54.2	400	425	151	166	75-125	6	20	M6
Cadmium	mg/kg	1.4	43.1	54.2	43.5	55.7	98	100	75-125	25	20	D6
Chromium	mg/kg	8.3	43.1	54.2	60.7	70.9	122	115	75-125	15	20	
Copper	mg/kg	109	43.1	54.2	173	172	149	115	75-125	.7	20	M6
Iron	mg/kg	12400	539	678	15600	15500	596	454	75-125	.8	20	M6

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QUALITY CONTROL DATA

Project: Black Pine Mine
Pace Project No.: 10160707

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 998306 998307

Parameter	Units	10160673001 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Lead	mg/kg	74.2	43.1	54.2	140	150	154	139	75-125	6	20	M6
Manganese	mg/kg	1980	43.1	54.2	1850	1860	-295	-213	75-125	.6	20	M6
Nickel	mg/kg	11.4	43.1	54.2	60.1	71.7	113	111	75-125	18	20	
Silver	mg/kg	2.2	43.1	54.2	47.3	58.9	105	104	75-125	22	20	D6
Zinc	mg/kg	144	43.1	54.2	210	219	154	138	75-125	4	20	M6

MATRIX SPIKE SAMPLE: 998308

Parameter	Units	10160673014 Result	Spike Conc.	MS Result	MS % Rec	% Rec Limits	Qualifiers
Antimony	mg/kg	16.8	32.4	32.0	47	75-125	M6
Arsenic	mg/kg	19.4	32.4	51.9	100	75-125	
Barium	mg/kg	143	32.4	248	324	75-125	M6
Cadmium	mg/kg	0.43	32.4	32.0	98	75-125	
Chromium	mg/kg	20.7	32.4	66.1	140	75-125	M6
Copper	mg/kg	57.9	32.4	85.9	86	75-125	
Iron	mg/kg	22300	404	36400	3500	75-125	M6
Lead	mg/kg	207	32.4	131	-236	75-125	M6
Manganese	mg/kg	404	32.4	1300	2780	75-125	M6
Nickel	mg/kg	9.1	32.4	46.0	114	75-125	
Silver	mg/kg	1.6	32.4	34.5	102	75-125	
Zinc	mg/kg	40.5	32.4	109	213	75-125	M6

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QUALITY CONTROL DATA

Project: Black Pine Mine
Pace Project No.: 10160707

QC Batch: MERP/5542 Analysis Method: EPA 7471
QC Batch Method: EPA 7471 Analysis Description: 7471 Mercury
Associated Lab Samples: 10160707002, 10160707004, 10160707006, 10160707009

METHOD BLANK: 999060 Matrix: Solid
Associated Lab Samples: 10160707002, 10160707004, 10160707006, 10160707009

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Mercury	mg/kg	<0.019	0.019	06/30/11 08:35	

LABORATORY CONTROL SAMPLE: 999061

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Mercury	mg/kg	.48	0.50	104	80-120	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 999062 999063

Parameter	Units	10160673001 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Mercury	mg/kg	14.4	1.4	1.5	14.3	20.1	-9	368	80-120	34	20	D6,M6

MATRIX SPIKE SAMPLE: 999064

Parameter	Units	10160707009 Result	Spike Conc.	MS Result	MS % Rec	% Rec Limits	Qualifiers
Mercury	mg/kg	27.4	1.3	27.7	16	80-120	M6

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QUALITY CONTROL DATA

Project: Black Pine Mine
Pace Project No.: 10160707

QC Batch: MPRP/26864 Analysis Method: % Moisture
QC Batch Method: % Moisture Analysis Description: Dry Weight/Percent Moisture
Associated Lab Samples: 10160707002, 10160707004, 10160707006, 10160707009

SAMPLE DUPLICATE: 1003029

Parameter	Units	10160673011 Result	Dup Result	RPD	Max RPD	Qualifiers
Percent Moisture	%	21.0	21.1	.5	30	

SAMPLE DUPLICATE: 1003030

Parameter	Units	10160756011 Result	Dup Result	RPD	Max RPD	Qualifiers
Percent Moisture	%	31.0	34.4	10	30	

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QUALITY CONTROL DATA

Project: Black Pine Mine
Pace Project No.: 10160707

QC Batch: MT/6228 Analysis Method: SM 2310
QC Batch Method: SM 2310 Analysis Description: 2310 Acidity
Associated Lab Samples: 10160707001, 10160707003, 10160707005, 10160707007, 10160707008

METHOD BLANK: 1000993 Matrix: Water
Associated Lab Samples: 10160707001, 10160707003, 10160707005, 10160707007, 10160707008

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Acidity	mg/L	<5.0	5.0	06/24/11 16:00	

SAMPLE DUPLICATE: 1000995

Parameter	Units	10160655003 Result	Dup Result	RPD	Max RPD	Qualifiers
Acidity	mg/L	16.7	16.7	0	20	

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QUALITY CONTROL DATA

Project: Black Pine Mine
Pace Project No.: 10160707

QC Batch: MT/6192 Analysis Method: SM 2540D
QC Batch Method: SM 2540D Analysis Description: 2540D Total Suspended Solids
Associated Lab Samples: 10160707001, 10160707003, 10160707005, 10160707007, 10160707008

METHOD BLANK: 998564 Matrix: Water
Associated Lab Samples: 10160707001, 10160707003, 10160707005, 10160707007, 10160707008

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Total Suspended Solids	mg/L	<1.0	1.0	06/20/11 10:40	

LABORATORY CONTROL SAMPLE: 998563

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Total Suspended Solids	mg/L	25	25.0	100	71-129	

SAMPLE DUPLICATE: 998919

Parameter	Units	10160673006 Result	Dup Result	RPD	Max RPD	Qualifiers
Total Suspended Solids	mg/L	<2.0	<2.0		20	

SAMPLE DUPLICATE: 998920

Parameter	Units	10160655005 Result	Dup Result	RPD	Max RPD	Qualifiers
Total Suspended Solids	mg/L	<2.0	2.2		20	

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QUALITY CONTROL DATA

Project: Black Pine Mine
Pace Project No.: 10160707

QC Batch: MT/6253 Analysis Method: EPA 300.0
QC Batch Method: EPA 300.0 Analysis Description: 300.0 IC Anions
Associated Lab Samples: 10160707001, 10160707003, 10160707005, 10160707007, 10160707008

METHOD BLANK: 1002777 Matrix: Water
Associated Lab Samples: 10160707001, 10160707003, 10160707005, 10160707007, 10160707008

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Sulfate	mg/L	<1.0	1.0	06/26/11 16:47	

LABORATORY CONTROL SAMPLE: 1002778

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Sulfate	mg/L	20	19.7	99	90-110	

MATRIX SPIKE SAMPLE: 1002779

Parameter	Units	10160722001 Result	Spike Conc.	MS Result	MS % Rec	% Rec Limits	Qualifiers
Sulfate	mg/L	17.3	40	60.6	108	80-120	

MATRIX SPIKE SAMPLE: 1002781

Parameter	Units	10161012001 Result	Spike Conc.	MS Result	MS % Rec	% Rec Limits	Qualifiers
Sulfate	mg/L	26.4	40	70.7	111	80-120	

SAMPLE DUPLICATE: 1002780

Parameter	Units	10160722002 Result	Dup Result	RPD	Max RPD	Qualifiers
Sulfate	mg/L	755	755	.1	20	

SAMPLE DUPLICATE: 1002782

Parameter	Units	10161012002 Result	Dup Result	RPD	Max RPD	Qualifiers
Sulfate	mg/L	1220	1220	.1	20	

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QUALITY CONTROL DATA

Project: Black Pine Mine
Pace Project No.: 10160707

QC Batch: WET/22674 Analysis Method: SM 2320B
QC Batch Method: SM 2320B Analysis Description: 2320B Alkalinity
Associated Lab Samples: 10160707001, 10160707003, 10160707005, 10160707007, 10160707008

METHOD BLANK: 998338 Matrix: Water
Associated Lab Samples: 10160707001, 10160707003, 10160707005, 10160707007, 10160707008

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Alkalinity, Total as CaCO3	mg/L	<5.0	5.0	06/20/11 11:16	

LABORATORY CONTROL SAMPLE & LCSD: 998339 998340

Parameter	Units	Spike Conc.	LCS Result	LCSD Result	LCS % Rec	LCSD % Rec	% Rec Limits	RPD	Max RPD	Qualifiers
Alkalinity, Total as CaCO3	mg/L	40	39.0	39.7	98	99	90-110	2	30	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 998341 998342

Parameter	Units	10160707001 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Alkalinity, Total as CaCO3	mg/L	13.4	40	40	53.2	53.8	99	101	80-120	1	30	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 998343 998344

Parameter	Units	10160722002 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Alkalinity, Total as CaCO3	mg/L	232	40	40	281	283	124	127	80-120	.4	30	M1

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QUALITY CONTROL DATA

Project: Black Pine Mine
Pace Project No.: 10160707

QC Batch: WET/22678 Analysis Method: SM 2540C
QC Batch Method: SM 2540C Analysis Description: 2540C Total Dissolved Solids
Associated Lab Samples: 10160707001, 10160707003, 10160707005, 10160707007, 10160707008

METHOD BLANK: 998440 Matrix: Water
Associated Lab Samples: 10160707001, 10160707003, 10160707005, 10160707007, 10160707008

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Total Dissolved Solids	mg/L	<10.0	10.0	06/20/11 12:01	

LABORATORY CONTROL SAMPLE: 998441

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Total Dissolved Solids	mg/L	1000	982	98	80-120	

SAMPLE DUPLICATE: 998442

Parameter	Units	10160707001 Result	Dup Result	RPD	Max RPD	Qualifiers
Total Dissolved Solids	mg/L	125	115	8	20	

SAMPLE DUPLICATE: 998443

Parameter	Units	10160655002 Result	Dup Result	RPD	Max RPD	Qualifiers
Total Dissolved Solids	mg/L	103	94.0	9	20	

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QUALIFIERS

Project: Black Pine Mine
Pace Project No.: 10160707

DEFINITIONS

DF - Dilution Factor, if reported, represents the factor applied to the reported data due to changes in sample preparation, dilution of the sample aliquot, or moisture content.

ND - Not Detected at or above adjusted reporting limit.

J - Estimated concentration above the adjusted method detection limit and below the adjusted reporting limit.

MDL - Adjusted Method Detection Limit.

S - Surrogate

1,2-Diphenylhydrazine (8270 listed analyte) decomposes to Azobenzene.

Consistent with EPA guidelines, unrounded data are displayed and have been used to calculate % recovery and RPD values.

LCS(D) - Laboratory Control Sample (Duplicate)

MS(D) - Matrix Spike (Duplicate)

DUP - Sample Duplicate

RPD - Relative Percent Difference

NC - Not Calculable.

SG - Silica Gel - Clean-Up

U - Indicates the compound was analyzed for, but not detected.

N-Nitrosodiphenylamine decomposes and cannot be separated from Diphenylamine using Method 8270. The result reported for each analyte is a combined concentration.

LABORATORIES

PASI-M	Pace Analytical Services - Minneapolis
PASI-MT	Pace Analytical Services - Montana

ANALYTE QUALIFIERS

D6	The relative percent difference (RPD) between the sample and sample duplicate exceeded laboratory control limits.
M1	Matrix spike recovery exceeded QC limits. Batch accepted based on laboratory control sample (LCS) recovery.
M6	Matrix spike and Matrix spike duplicate recovery not evaluated against control limits due to sample dilution.

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QUALITY CONTROL DATA CROSS REFERENCE TABLE

Project: Black Pine Mine
Pace Project No.: 10160707

Lab ID	Sample ID	QC Batch Method	QC Batch	Analytical Method	Analytical Batch
10160707001	**TSP-8**	EPA 200.8	MPRP/26726	EPA 200.8	ICPM/10928
10160707003	**CML-SW-06**	EPA 200.8	MPRP/26726	EPA 200.8	ICPM/10928
10160707005	**TSP-3**	EPA 200.8	MPRP/26726	EPA 200.8	ICPM/10928
10160707007	**TSP-9**	EPA 200.8	MPRP/26726	EPA 200.8	ICPM/10928
10160707008	**MCSP-1**	EPA 200.8	MPRP/26726	EPA 200.8	ICPM/10928
10160707002	**BP-TS-SD-01-00**	EPA 3050	MPRP/26729	EPA 6020	ICPM/10930
10160707004	**CML-SD-06-00**	EPA 3050	MPRP/26729	EPA 6020	ICPM/10930
10160707006	**BP-TS-SD-02-00**	EPA 3050	MPRP/26729	EPA 6020	ICPM/10930
10160707009	**HM-SD-01**	EPA 3050	MPRP/26729	EPA 6020	ICPM/10930
10160707002	**BP-TS-SD-01-00**	EPA 7471	MERP/5542	EPA 7471	MERC/6387
10160707004	**CML-SD-06-00**	EPA 7471	MERP/5542	EPA 7471	MERC/6387
10160707006	**BP-TS-SD-02-00**	EPA 7471	MERP/5542	EPA 7471	MERC/6387
10160707009	**HM-SD-01**	EPA 7471	MERP/5542	EPA 7471	MERC/6387
10160707002	**BP-TS-SD-01-00**	% Moisture	MPRP/26864		
10160707004	**CML-SD-06-00**	% Moisture	MPRP/26864		
10160707006	**BP-TS-SD-02-00**	% Moisture	MPRP/26864		
10160707009	**HM-SD-01**	% Moisture	MPRP/26864		
10160707001	**TSP-8**	SM 2310	MT/6228		
10160707003	**CML-SW-06**	SM 2310	MT/6228		
10160707005	**TSP-3**	SM 2310	MT/6228		
10160707007	**TSP-9**	SM 2310	MT/6228		
10160707008	**MCSP-1**	SM 2310	MT/6228		
10160707001	**TSP-8**	SM 2540D	MT/6192		
10160707003	**CML-SW-06**	SM 2540D	MT/6192		
10160707005	**TSP-3**	SM 2540D	MT/6192		
10160707007	**TSP-9**	SM 2540D	MT/6192		
10160707008	**MCSP-1**	SM 2540D	MT/6192		
10160707001	**TSP-8**	EPA 300.0	MT/6253		
10160707003	**CML-SW-06**	EPA 300.0	MT/6253		
10160707005	**TSP-3**	EPA 300.0	MT/6253		
10160707007	**TSP-9**	EPA 300.0	MT/6253		
10160707008	**MCSP-1**	EPA 300.0	MT/6253		
10160707001	**TSP-8**	SM 2320B	WET/22674		
10160707003	**CML-SW-06**	SM 2320B	WET/22674		
10160707005	**TSP-3**	SM 2320B	WET/22674		
10160707007	**TSP-9**	SM 2320B	WET/22674		
10160707008	**MCSP-1**	SM 2320B	WET/22674		
10160707001	**TSP-8**	SM 2540C	WET/22678		
10160707003	**CML-SW-06**	SM 2540C	WET/22678		
10160707005	**TSP-3**	SM 2540C	WET/22678		
10160707007	**TSP-9**	SM 2540C	WET/22678		
10160707008	**MCSP-1**	SM 2540C	WET/22678		

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July 07, 2011

Kevin Houck
Herrera Environmental Consultants
101 East Broadway, Suite 610
Missoula, MT 59802

RE: Project: Black Pine Mine
Pace Project No.: 10160756

Dear Kevin Houck:
Enclosed are the analytical results for sample(s) received by the laboratory on June 17, 2011. The results relate only to the samples included in this report.

If you have any questions concerning this report, please feel free to contact me.

Sincerely,

Denise Jensen

denise.jensen@pacelabs.com
Project Manager

Enclosures

cc: Devin Clary, Montana Dept. of Environmental Quality
Mark Donner, Trihydro

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CERTIFICATIONS

Project: Black Pine Mine
Pace Project No.: 10160756

Minnesota Certification IDs

1700 Elm Street SE Suite 200, Minneapolis, MN 55414
A2LA Certification #: 2926.01
Alaska Certification #: UST-078
Alaska Certification #MN00064
Arizona Certification #: AZ-0014
Arkansas Certification #: 88-0680
California Certification #: 01155CA
EPA Region 8 Certification #: Pace
Florida/NELAP Certification #: E87605
Georgia Certification #: 959
Idaho Certification #: MN00064
Illinois Certification #: 200011
Iowa Certification #: 368
Kansas Certification #: E-10167
Louisiana Certification #: 03086
Louisiana Certification #: LA080009
Maine Certification #: 2007029
Maryland Certification #: 322
Michigan DEQ Certification #: 9909
Minnesota Certification #: 027-053-137
Mississippi Certification #: Pace
Montana Certification #: MT CERT0092
Nebraska Certification #: Pace
Nevada Certification #: MN_00064
New Jersey Certification #: MN-002
New Mexico Certification #: Pace
New York Certification #: 11647
North Carolina Certification #: 530
North Dakota Certification #: R-036
North Dakota Certification #: R-036A
Ohio VAP Certification #: CL101
Oklahoma Certification #: D9921
Oklahoma Certification #: 9507
Oregon Certification #: MN200001
Pennsylvania Certification #: 68-00563
Puerto Rico Certification
Tennessee Certification #: 02818
Texas Certification #: T104704192
Washington Certification #: C754
Wisconsin Certification #: 999407970

Montana Certification IDs

602 South 25th Street, Billings, MT 59101
EPA Region 8 Certification #: 8TMS-Q
Idaho Certification #: MT00012
Montana Certification #: MT CERT0040
NVLAP Certification #: 101292-0
Minnesota Dept of Health Certification #: 030-999-442

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SAMPLE SUMMARY

Project: Black Pine Mine
Pace Project No.: 10160756

Lab ID	Sample ID	Matrix	Date Collected	Date Received
10160756001	**CML-SW-14**	Water	06/15/11 13:29	06/17/11 08:50
10160756002	**CML-SW-19**	Water	06/15/11 12:59	06/17/11 08:50
10160756003	**CML-SW-02**	Water	06/15/11 14:03	06/17/11 08:50
10160756004	**CML-Q1-T2**	Water	06/15/11 14:03	06/17/11 08:50
10160756005	**CML-SW-01**	Water	06/15/11 15:49	06/17/11 08:50
10160756006	**CML-SW-09**	Water	06/15/11 15:13	06/17/11 08:50
10160756007	**CML-SD-15-00**	Solid	06/16/11 09:55	06/17/11 08:50
10160756008	**CML-SD-13-00**	Solid	06/16/11 09:20	06/17/11 08:50
10160756009	**CML-SD-17-00**	Solid	06/16/11 10:40	06/17/11 08:50
10160756010	**CML-SD-14-00**	Solid	06/16/11 09:30	06/17/11 08:50
10160756011	**CML-SD-16-00**	Solid	06/16/11 10:30	06/17/11 08:50

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SAMPLE ANALYTE COUNT

Project: Black Pine Mine
Pace Project No.: 10160756

Lab ID	Sample ID	Method	Analysts	Analytes Reported	Laboratory
10160756001	**CML-SW-14**	EPA 200.8	RJS	12	PASI-M
		SM 2310	CAC	1	PASI-MT
		SM 2540D	SR1	1	PASI-MT
		EPA 300.0	JH1	1	PASI-MT
		SM 2320B	MWD	1	PASI-M
		SM 2540C	CAP	1	PASI-M
10160756002	**CML-SW-19**	EPA 200.8	RJS	12	PASI-M
		SM 2310	CAC	1	PASI-MT
		SM 2540D	SR1	1	PASI-MT
		EPA 300.0	JH1	1	PASI-MT
		SM 2320B	MWD	1	PASI-M
		SM 2540C	CAP	1	PASI-M
10160756003	**CML-SW-02**	EPA 200.8	RJS	12	PASI-M
		SM 2310	CAC	1	PASI-MT
		SM 2540D	SR1	1	PASI-MT
		EPA 300.0	JH1	1	PASI-MT
		SM 2320B	MWD	1	PASI-M
		SM 2540C	CAP	1	PASI-M
10160756004	**CML-Q1-T2**	EPA 200.8	RJS	11	PASI-M
10160756005	**CML-SW-01**	EPA 200.8	RJS	12	PASI-M
		SM 2310	CAC	1	PASI-MT
		SM 2540D	SR1	1	PASI-MT
		EPA 300.0	JH1	1	PASI-MT
		SM 2320B	MWD	1	PASI-M
		SM 2540C	CAP	1	PASI-M
10160756006	**CML-SW-09**	EPA 200.8	RJS	12	PASI-M
		SM 2310	CAC	1	PASI-MT
		SM 2540D	SR1	1	PASI-MT
		EPA 300.0	JH1	1	PASI-MT
		SM 2320B	MWD	1	PASI-M
		SM 2540C	CAP	1	PASI-M
10160756007	**CML-SD-15-00**	EPA 6020	CJS, TL1	12	PASI-M
		EPA 7471	TEM	1	PASI-M
		% Moisture	JDL	1	PASI-M
10160756008	**CML-SD-13-00**	EPA 6020	CJS, TL1	12	PASI-M
		EPA 7471	TEM	1	PASI-M
		% Moisture	JDL	1	PASI-M

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SAMPLE ANALYTE COUNT

Project: Black Pine Mine
Pace Project No.: 10160756

Lab ID	Sample ID	Method	Analysts	Analytes Reported	Laboratory
10160756009	**CML-SD-17-00**	EPA 6020	CJS, TL1	12	PASI-M
		EPA 7471	TEM	1	PASI-M
		% Moisture	JDL	1	PASI-M
10160756010	**CML-SD-14-00**	EPA 6020	CJS, TL1	12	PASI-M
		EPA 7471	TEM	1	PASI-M
		% Moisture	JDL	1	PASI-M
10160756011	**CML-SD-16-00**	EPA 6020	CJS, TL1	12	PASI-M
		EPA 7471	TEM	1	PASI-M
		% Moisture	JDL	1	PASI-M

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PROJECT NARRATIVE

Project: Black Pine Mine
Pace Project No.: 10160756

Method: **EPA 200.8**
Description: 200.8 MET ICPMS
Client: Montana Dept. of Environmental Quality
Date: July 07, 2011

General Information:
6 samples were analyzed for EPA 200.8. All samples were received in acceptable condition with any exceptions noted below.

Hold Time:
The samples were analyzed within the method required hold times with any exceptions noted below.

Sample Preparation:
The samples were prepared in accordance with EPA 200.8 with any exceptions noted below.

Initial Calibrations (including MS Tune as applicable):
All criteria were within method requirements with any exceptions noted below.

Continuing Calibration:
All criteria were within method requirements with any exceptions noted below.

Internal Standards:
All internal standards were within QC limits with any exceptions noted below.

Method Blank:
All analytes were below the report limit in the method blank with any exceptions noted below.

Laboratory Control Spike:
All laboratory control spike compounds were within QC limits with any exceptions noted below.

Matrix Spikes:
All percent recoveries and relative percent differences (RPDs) were within acceptance criteria with any exceptions noted below.

QC Batch: MPRP/26758

A matrix spike and matrix spike duplicate (MS/MSD) were performed on the following sample(s): 10160756005,9296528001

M0: Matrix spike recovery and/or matrix spike duplicate recovery was outside laboratory control limits.

- MS (Lab ID: 1001302)
  - Iron
- MS (Lab ID: 999082)
  - Iron

M1: Matrix spike recovery exceeded QC limits. Batch accepted based on laboratory control sample (LCS) recovery.

- MS (Lab ID: 999082)
  - Silver

Duplicate Sample:
All duplicate sample results were within method acceptance criteria with any exceptions noted below.

Additional Comments:

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PROJECT NARRATIVE

Project: Black Pine Mine
Pace Project No.: 10160756

Method: **EPA 6020**
Description: 6020 MET ICPMS
Client: Montana Dept. of Environmental Quality
Date: July 07, 2011

General Information:
5 samples were analyzed for EPA 6020. All samples were received in acceptable condition with any exceptions noted below.

Hold Time:
The samples were analyzed within the method required hold times with any exceptions noted below.

Sample Preparation:
The samples were prepared in accordance with EPA 3050 with any exceptions noted below.

Initial Calibrations (including MS Tune as applicable):
All criteria were within method requirements with any exceptions noted below.

Continuing Calibration:
All criteria were within method requirements with any exceptions noted below.

Internal Standards:
All internal standards were within QC limits with any exceptions noted below.

Method Blank:
All analytes were below the report limit in the method blank with any exceptions noted below.

Laboratory Control Spike:
All laboratory control spike compounds were within QC limits with any exceptions noted below.

Matrix Spikes:
All percent recoveries and relative percent differences (RPDs) were within acceptance criteria with any exceptions noted below.

QC Batch: MPRP/26730

A matrix spike and matrix spike duplicate (MS/MSD) were performed on the following sample(s): 10160501002,258133003

M6: Matrix spike and Matrix spike duplicate recovery not evaluated against control limits due to sample dilution.

- MS (Lab ID: 998311)
  - Barium
  - Copper
  - Iron
  - Manganese
  - Zinc
- MS (Lab ID: 998313)
  - Antimony
  - Barium
  - Iron
  - Manganese
- MSD (Lab ID: 998312)
  - Antimony
  - Barium

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PROJECT NARRATIVE

Project: Black Pine Mine
Pace Project No.: 10160756

Method: **EPA 6020**
Description: 6020 MET ICPMS
Client: Montana Dept. of Environmental Quality
Date: July 07, 2011

QC Batch: MPRP/26730

A matrix spike and matrix spike duplicate (MS/MSD) were performed on the following sample(s): 10160501002,258133003

M6: Matrix spike and Matrix spike duplicate recovery not evaluated against control limits due to sample dilution.

- Chromium
- Iron
- Manganese

Duplicate Sample:
All duplicate sample results were within method acceptance criteria with any exceptions noted below.

Additional Comments:

Analyte Comments:

QC Batch: MPRP/26730

E: Analyte concentration exceeded the calibration range. The reported result is estimated.

- MS (Lab ID: 998311)
  - Manganese
- MSD (Lab ID: 998312)
  - Manganese

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PROJECT NARRATIVE

Project: Black Pine Mine
Pace Project No.: 10160756

Method: **EPA 7471**
Description: 7471 Mercury
Client: Montana Dept. of Environmental Quality
Date: July 07, 2011

General Information:
5 samples were analyzed for EPA 7471. All samples were received in acceptable condition with any exceptions noted below.

Hold Time:
The samples were analyzed within the method required hold times with any exceptions noted below.

Sample Preparation:
The samples were prepared in accordance with EPA 7471 with any exceptions noted below.

Initial Calibrations (including MS Tune as applicable):
All criteria were within method requirements with any exceptions noted below.

Continuing Calibration:
All criteria were within method requirements with any exceptions noted below.

Method Blank:
All analytes were below the report limit in the method blank with any exceptions noted below.

Laboratory Control Spike:
All laboratory control spike compounds were within QC limits with any exceptions noted below.

Matrix Spikes:
All percent recoveries and relative percent differences (RPDs) were within acceptance criteria with any exceptions noted below.

QC Batch: MERP/5556

A matrix spike and matrix spike duplicate (MS/MSD) were performed on the following sample(s): 10160647003,10161056004

M1: Matrix spike recovery exceeded QC limits. Batch accepted based on laboratory control sample (LCS) recovery.

- MS (Lab ID: 1000722)
  - Mercury

Duplicate Sample:
All duplicate sample results were within method acceptance criteria with any exceptions noted below.

Additional Comments:

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PROJECT NARRATIVE

Project: Black Pine Mine
Pace Project No.: 10160756

Method: **SM 2310**
Description: 2310 Acidity
Client: Montana Dept. of Environmental Quality
Date: July 07, 2011

General Information:
5 samples were analyzed for SM 2310. All samples were received in acceptable condition with any exceptions noted below.

Hold Time:
The samples were analyzed within the method required hold times with any exceptions noted below.

Initial Calibrations (including MS Tune as applicable):
All criteria were within method requirements with any exceptions noted below.

Continuing Calibration:
All criteria were within method requirements with any exceptions noted below.

Internal Standards:
All internal standards were within QC limits with any exceptions noted below.

Surrogates:
All surrogates were within QC limits with any exceptions noted below.

Method Blank:
All analytes were below the report limit in the method blank with any exceptions noted below.

Laboratory Control Spike:
All laboratory control spike compounds were within QC limits with any exceptions noted below.

Matrix Spikes:
All percent recoveries and relative percent differences (RPDs) were within acceptance criteria with any exceptions noted below.

Duplicate Sample:
All duplicate sample results were within method acceptance criteria with any exceptions noted below.

Additional Comments:

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PROJECT NARRATIVE

Project: Black Pine Mine
Pace Project No.: 10160756

Method: **SM 2540D**
Description: 2540D Total Suspended Solids
Client: Montana Dept. of Environmental Quality
Date: July 07, 2011

General Information:
5 samples were analyzed for SM 2540D. All samples were received in acceptable condition with any exceptions noted below.

Hold Time:
The samples were analyzed within the method required hold times with any exceptions noted below.

Initial Calibrations (including MS Tune as applicable):
All criteria were within method requirements with any exceptions noted below.

Continuing Calibration:
All criteria were within method requirements with any exceptions noted below.

Internal Standards:
All internal standards were within QC limits with any exceptions noted below.

Surrogates:
All surrogates were within QC limits with any exceptions noted below.

Method Blank:
All analytes were below the report limit in the method blank with any exceptions noted below.

Laboratory Control Spike:
All laboratory control spike compounds were within QC limits with any exceptions noted below.

Matrix Spikes:
All percent recoveries and relative percent differences (RPDs) were within acceptance criteria with any exceptions noted below.

Duplicate Sample:
All duplicate sample results were within method acceptance criteria with any exceptions noted below.

Additional Comments:

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PROJECT NARRATIVE

Project: Black Pine Mine
Pace Project No.: 10160756

Method: **EPA 300.0**
Description: 300.0 IC Anions
Client: Montana Dept. of Environmental Quality
Date: July 07, 2011

General Information:
5 samples were analyzed for EPA 300.0. All samples were received in acceptable condition with any exceptions noted below.

Hold Time:
The samples were analyzed within the method required hold times with any exceptions noted below.

Initial Calibrations (including MS Tune as applicable):
All criteria were within method requirements with any exceptions noted below.

Continuing Calibration:
All criteria were within method requirements with any exceptions noted below.

Internal Standards:
All internal standards were within QC limits with any exceptions noted below.

Surrogates:
All surrogates were within QC limits with any exceptions noted below.

Method Blank:
All analytes were below the report limit in the method blank with any exceptions noted below.

Laboratory Control Spike:
All laboratory control spike compounds were within QC limits with any exceptions noted below.

Matrix Spikes:
All percent recoveries and relative percent differences (RPDs) were within acceptance criteria with any exceptions noted below.

Duplicate Sample:
All duplicate sample results were within method acceptance criteria with any exceptions noted below.

Additional Comments:

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PROJECT NARRATIVE

Project: Black Pine Mine
Pace Project No.: 10160756

Method: **SM 2320B**
Description: 2320B Alkalinity
Client: Montana Dept. of Environmental Quality
Date: July 07, 2011

General Information:
5 samples were analyzed for SM 2320B. All samples were received in acceptable condition with any exceptions noted below.

Hold Time:
The samples were analyzed within the method required hold times with any exceptions noted below.

Method Blank:
All analytes were below the report limit in the method blank with any exceptions noted below.

Laboratory Control Spike:
All laboratory control spike compounds were within QC limits with any exceptions noted below.

Matrix Spikes:
All percent recoveries and relative percent differences (RPDs) were within acceptance criteria with any exceptions noted below.

QC Batch: WET/22702

A matrix spike and matrix spike duplicate (MS/MSD) were performed on the following sample(s): 10160702001,10161012002

M1: Matrix spike recovery exceeded QC limits. Batch accepted based on laboratory control sample (LCS) recovery.

- MS (Lab ID: 1000795)
  - Alkalinity, Total as CaCO3

Duplicate Sample:
All duplicate sample results were within method acceptance criteria with any exceptions noted below.

Additional Comments:

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PROJECT NARRATIVE

Project: Black Pine Mine
Pace Project No.: 10160756

Method: **SM 2540C**
Description: 2540C Total Dissolved Solids
Client: Montana Dept. of Environmental Quality
Date: July 07, 2011

General Information:
5 samples were analyzed for SM 2540C. All samples were received in acceptable condition with any exceptions noted below.

Hold Time:
The samples were analyzed within the method required hold times with any exceptions noted below.

Method Blank:
All analytes were below the report limit in the method blank with any exceptions noted below.

Laboratory Control Spike:
All laboratory control spike compounds were within QC limits with any exceptions noted below.

Matrix Spikes:
All percent recoveries and relative percent differences (RPDs) were within acceptance criteria with any exceptions noted below.

Duplicate Sample:
All duplicate sample results were within method acceptance criteria with any exceptions noted below.

Additional Comments:

This data package has been reviewed for quality and completeness and is approved for release.

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ANALYTICAL RESULTS

Project: Black Pine Mine
Pace Project No.: 10160756

Sample: CML-SW-14 **Lab ID: 10160756001** Collected: 06/15/11 13:29 Received: 06/17/11 08:50 Matrix: Water

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
200.8 MET ICPMS	Analytical Method: EPA 200.8 Preparation Method: EPA 200.8							
Antimony	**<0.50**	ug/L	0.50	1	06/23/11 15:57	06/28/11 14:12	7440-36-0	
Arsenic	**0.51**	ug/L	0.50	1	06/23/11 15:57	06/28/11 14:12	7440-38-2	
Barium	**38.6**	ug/L	0.30	1	06/23/11 15:57	06/28/11 14:12	7440-39-3	
Cadmium	**<0.080**	ug/L	0.080	1	06/23/11 15:57	06/28/11 14:12	7440-43-9	
Chromium	**0.64**	ug/L	0.50	1	06/23/11 15:57	06/28/11 14:12	7440-47-3	
Copper	**3.5**	ug/L	0.50	1	06/23/11 15:57	06/28/11 14:12	7440-50-8	
Iron	**442**	ug/L	50.0	1	06/23/11 15:57	06/28/11 14:12	7439-89-6	
Lead	**0.36**	ug/L	0.10	1	06/23/11 15:57	06/28/11 14:12	7439-92-1	
Manganese	**8.1**	ug/L	0.50	1	06/23/11 15:57	06/28/11 14:12	7439-96-5	
Nickel	**0.57**	ug/L	0.50	1	06/23/11 15:57	06/28/11 14:12	7440-02-0	
Silver	**<0.50**	ug/L	0.50	1	06/23/11 15:57	06/28/11 14:12	7440-22-4	
Zinc	**<5.0**	ug/L	5.0	1	06/23/11 15:57	06/28/11 14:12	7440-66-6	
2310 Acidity	Analytical Method: SM 2310							
Acidity	**6.3**	mg/L	5.0	1		06/24/11 16:55		
2540D Total Suspended Solids	Analytical Method: SM 2540D							
Total Suspended Solids	**1.9**	mg/L	1.0	1		06/21/11 16:47		
300.0 IC Anions	Analytical Method: EPA 300.0							
Sulfate	**2.5**	mg/L	1.0	1		06/28/11 19:58	14808-79-8	
2320B Alkalinity	Analytical Method: SM 2320B							
Alkalinity, Total as CaCO3	**7.8**	mg/L	5.0	1		06/23/11 13:33		
2540C Total Dissolved Solids	Analytical Method: SM 2540C							
Total Dissolved Solids	**31.0**	mg/L	10.0	1		06/22/11 11:30		

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ANALYTICAL RESULTS

Project: Black Pine Mine
Pace Project No.: 10160756

Sample: CML-SW-19 **Lab ID: 10160756002** Collected: 06/15/11 12:59 Received: 06/17/11 08:50 Matrix: Water

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
200.8 MET ICPMS	Analytical Method: EPA 200.8 Preparation Method: EPA 200.8							
Antimony	**<0.50**	ug/L	0.50	1	06/23/11 15:57	06/28/11 14:16	7440-36-0	
Arsenic	**<0.50**	ug/L	0.50	1	06/23/11 15:57	06/28/11 14:16	7440-38-2	
Barium	**44.6**	ug/L	0.30	1	06/23/11 15:57	06/28/11 14:16	7440-39-3	
Cadmium	**<0.080**	ug/L	0.080	1	06/23/11 15:57	06/28/11 14:16	7440-43-9	
Chromium	**0.69**	ug/L	0.50	1	06/23/11 15:57	06/28/11 14:16	7440-47-3	
Copper	**3.6**	ug/L	0.50	1	06/23/11 15:57	06/28/11 14:16	7440-50-8	
Iron	**308**	ug/L	50.0	1	06/23/11 15:57	06/28/11 14:16	7439-89-6	
Lead	**0.37**	ug/L	0.10	1	06/23/11 15:57	06/28/11 14:16	7439-92-1	
Manganese	**4.1**	ug/L	0.50	1	06/23/11 15:57	06/28/11 14:16	7439-96-5	
Nickel	**0.61**	ug/L	0.50	1	06/23/11 15:57	06/28/11 14:16	7440-02-0	
Silver	**<0.50**	ug/L	0.50	1	06/23/11 15:57	06/28/11 14:16	7440-22-4	
Zinc	**<5.0**	ug/L	5.0	1	06/23/11 15:57	06/28/11 14:16	7440-66-6	
2310 Acidity	Analytical Method: SM 2310							
Acidity	**10.1**	mg/L	5.0	1		06/24/11 16:55		
2540D Total Suspended Solids	Analytical Method: SM 2540D							
Total Suspended Solids	**1.3**	mg/L	1.0	1		06/21/11 16:47		
300.0 IC Anions	Analytical Method: EPA 300.0							
Sulfate	**2.4**	mg/L	1.0	1		06/28/11 20:27	14808-79-8	
2320B Alkalinity	Analytical Method: SM 2320B							
Alkalinity, Total as CaCO3	**7.6**	mg/L	5.0	1		06/23/11 13:36		
2540C Total Dissolved Solids	Analytical Method: SM 2540C							
Total Dissolved Solids	**32.0**	mg/L	10.0	1		06/22/11 11:30		

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ANALYTICAL RESULTS

Project: Black Pine Mine
Pace Project No.: 10160756

Sample: CML-SW-02 **Lab ID: 10160756003** Collected: 06/15/11 14:03 Received: 06/17/11 08:50 Matrix: Water

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
200.8 MET ICPMS	Analytical Method: EPA 200.8 Preparation Method: EPA 200.8							
Antimony	**1.7**	ug/L	0.50	1	06/23/11 15:57	06/28/11 14:21	7440-36-0	
Arsenic	**1.2**	ug/L	0.50	1	06/23/11 15:57	06/28/11 14:21	7440-38-2	
Barium	**43.5**	ug/L	0.30	1	06/23/11 15:57	06/28/11 14:21	7440-39-3	
Cadmium	**0.095**	ug/L	0.080	1	06/23/11 15:57	06/28/11 14:21	7440-43-9	
Chromium	**0.71**	ug/L	0.50	1	06/23/11 15:57	06/28/11 14:21	7440-47-3	
Copper	**14.0**	ug/L	0.50	1	06/23/11 15:57	06/28/11 14:21	7440-50-8	
Iron	**420**	ug/L	50.0	1	06/23/11 15:57	06/28/11 14:21	7439-89-6	
Lead	**5.1**	ug/L	0.10	1	06/23/11 15:57	06/28/11 14:21	7439-92-1	
Manganese	**10.4**	ug/L	0.50	1	06/23/11 15:57	06/28/11 14:21	7439-96-5	
Nickel	**0.77**	ug/L	0.50	1	06/23/11 15:57	06/28/11 14:21	7440-02-0	
Silver	**<0.50**	ug/L	0.50	1	06/23/11 15:57	06/28/11 14:21	7440-22-4	
Zinc	**7.0**	ug/L	5.0	1	06/23/11 15:57	06/28/11 14:21	7440-66-6	
2310 Acidity	Analytical Method: SM 2310							
Acidity	**21.5**	mg/L	5.0	1		06/24/11 16:55		
2540D Total Suspended Solids	Analytical Method: SM 2540D							
Total Suspended Solids	**1.7**	mg/L	1.0	1		06/21/11 16:47		
300.0 IC Anions	Analytical Method: EPA 300.0							
Sulfate	**2.8**	mg/L	1.0	1		06/28/11 20:55	14808-79-8	
2320B Alkalinity	Analytical Method: SM 2320B							
Alkalinity, Total as CaCO3	**7.7**	mg/L	5.0	1		06/23/11 13:39		
2540C Total Dissolved Solids	Analytical Method: SM 2540C							
Total Dissolved Solids	**37.0**	mg/L	10.0	1		06/22/11 11:31		

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ANALYTICAL RESULTS

Project: Black Pine Mine
Pace Project No.: 10160756

Sample: CML-Q1-T2 **Lab ID: 10160756004** Collected: 06/15/11 14:03 Received: 06/17/11 08:50 Matrix: Water

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
200.8 MET ICPMS	Analytical Method: EPA 200.8 Preparation Method: EPA 200.8							
Antimony	**1.3**	ug/L	0.50	1	06/23/11 15:57	06/28/11 14:26	7440-36-0	
Arsenic	**0.80**	ug/L	0.50	1	06/23/11 15:57	06/28/11 14:26	7440-38-2	
Barium	**41.3**	ug/L	0.30	1	06/23/11 15:57	06/28/11 14:26	7440-39-3	
Cadmium	**<0.080**	ug/L	0.080	1	06/23/11 15:57	06/28/11 14:26	7440-43-9	
Chromium	**1.1**	ug/L	0.50	1	06/23/11 15:57	06/28/11 14:26	7440-47-3	
Copper	**9.9**	ug/L	0.50	1	06/23/11 15:57	06/28/11 14:26	7440-50-8	
Iron	**562**	ug/L	50.0	1	06/23/11 15:57	06/28/11 14:26	7439-89-6	
Lead	**1.0**	ug/L	0.10	1	06/23/11 15:57	06/28/11 14:26	7439-92-1	
Manganese	**6.8**	ug/L	0.50	1	06/23/11 15:57	06/28/11 14:26	7439-96-5	
Silver	**<0.50**	ug/L	0.50	1	06/23/11 15:57	06/28/11 14:26	7440-22-4	
Zinc	**5.9**	ug/L	5.0	1	06/23/11 15:57	06/28/11 14:26	7440-66-6	

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ANALYTICAL RESULTS

Project: Black Pine Mine
Pace Project No.: 10160756

Sample: CML-SW-01 **Lab ID: 10160756005** Collected: 06/15/11 15:49 Received: 06/17/11 08:50 Matrix: Water

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
200.8 MET ICPMS	Analytical Method: EPA 200.8 Preparation Method: EPA 200.8							
Antimony	**3.4**	ug/L	0.50	1	06/23/11 15:57	06/28/11 06:52	7440-36-0	
Arsenic	**1.7**	ug/L	0.50	1	06/23/11 15:57	06/28/11 06:52	7440-38-2	
Barium	**36.6**	ug/L	0.30	1	06/23/11 15:57	06/28/11 06:52	7440-39-3	
Cadmium	**0.15**	ug/L	0.080	1	06/23/11 15:57	06/28/11 06:52	7440-43-9	
Chromium	**0.83**	ug/L	0.50	1	06/23/11 15:57	06/28/11 06:52	7440-47-3	
Copper	**17.4**	ug/L	0.50	1	06/23/11 15:57	06/28/11 06:52	7440-50-8	
Iron	**617**	ug/L	50.0	1	06/23/11 15:57	06/28/11 06:52	7439-89-6	M0
Lead	**3.8**	ug/L	0.10	1	06/23/11 15:57	06/28/11 06:52	7439-92-1	
Manganese	**7.1**	ug/L	0.50	1	06/23/11 15:57	06/28/11 06:52	7439-96-5	
Nickel	**0.88**	ug/L	0.50	1	06/23/11 15:57	06/28/11 06:52	7440-02-0	
Silver	**<0.50**	ug/L	0.50	1	06/23/11 15:57	06/28/11 06:52	7440-22-4	
Zinc	**14.2**	ug/L	5.0	1	06/23/11 15:57	06/28/11 06:52	7440-66-6	
2310 Acidity	Analytical Method: SM 2310							
Acidity	**21.5**	mg/L	5.0	1		06/24/11 16:55		
2540D Total Suspended Solids	Analytical Method: SM 2540D							
Total Suspended Solids	**1.4**	mg/L	1.0	1		06/21/11 16:47		
300.0 IC Anions	Analytical Method: EPA 300.0							
Sulfate	**3.5**	mg/L	1.0	1		06/28/11 21:24	14808-79-8	
2320B Alkalinity	Analytical Method: SM 2320B							
Alkalinity, Total as CaCO3	**6.8**	mg/L	5.0	1		06/23/11 13:43		
2540C Total Dissolved Solids	Analytical Method: SM 2540C							
Total Dissolved Solids	**39.0**	mg/L	10.0	1		06/22/11 11:31		

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ANALYTICAL RESULTS

Project: Black Pine Mine
Pace Project No.: 10160756

Sample: CML-SW-09 **Lab ID: 10160756006** Collected: 06/15/11 15:13 Received: 06/17/11 08:50 Matrix: Water

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
200.8 MET ICPMS	Analytical Method: EPA 200.8 Preparation Method: EPA 200.8							
Antimony	**3.0**	ug/L	0.50	1	06/23/11 15:57	06/28/11 14:31	7440-36-0	
Arsenic	**1.4**	ug/L	0.50	1	06/23/11 15:57	06/28/11 14:31	7440-38-2	
Barium	**36.2**	ug/L	0.30	1	06/23/11 15:57	06/28/11 14:31	7440-39-3	
Cadmium	**0.13**	ug/L	0.080	1	06/23/11 15:57	06/28/11 14:31	7440-43-9	
Chromium	**0.83**	ug/L	0.50	1	06/23/11 15:57	06/28/11 14:31	7440-47-3	
Copper	**15.8**	ug/L	0.50	1	06/23/11 15:57	06/28/11 14:31	7440-50-8	
Iron	**406**	ug/L	50.0	1	06/23/11 15:57	06/28/11 14:31	7439-89-6	
Lead	**2.9**	ug/L	0.10	1	06/23/11 15:57	06/28/11 14:31	7439-92-1	
Manganese	**6.1**	ug/L	0.50	1	06/23/11 15:57	06/28/11 14:31	7439-96-5	
Nickel	**0.84**	ug/L	0.50	1	06/23/11 15:57	06/28/11 14:31	7440-02-0	
Silver	**<0.50**	ug/L	0.50	1	06/23/11 15:57	06/28/11 14:31	7440-22-4	
Zinc	**11.8**	ug/L	5.0	1	06/23/11 15:57	06/28/11 14:31	7440-66-6	
2310 Acidity	Analytical Method: SM 2310							
Acidity	**17.7**	mg/L	5.0	1		06/24/11 16:55		
2540D Total Suspended Solids	Analytical Method: SM 2540D							
Total Suspended Solids	**2.3**	mg/L	1.0	1		06/21/11 16:47		
300.0 IC Anions	Analytical Method: EPA 300.0							
Sulfate	**3.5**	mg/L	1.0	1		06/29/11 01:12	14808-79-8	
2320B Alkalinity	Analytical Method: SM 2320B							
Alkalinity, Total as CaCO3	**6.5**	mg/L	5.0	1		06/23/11 13:53		
2540C Total Dissolved Solids	Analytical Method: SM 2540C							
Total Dissolved Solids	**35.0**	mg/L	10.0	1		06/22/11 11:32		

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ANALYTICAL RESULTS

Project: Black Pine Mine
Pace Project No.: 10160756

Sample: CML-SD-15-00 **Lab ID: 10160756007** Collected: 06/16/11 09:55 Received: 06/17/11 08:50 Matrix: Solid

Results reported on a "dry-weight" basis

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
6020 MET ICPMS	Analytical Method: EPA 6020 Preparation Method: EPA 3050							
Antimony	**1300**	mg/kg	11.9	400	06/28/11 17:50	06/30/11 12:14	7440-36-0	
Arsenic	**1250**	mg/kg	1.5	50	06/28/11 17:50	06/30/11 12:11	7440-38-2	
Barium	**1030**	mg/kg	0.90	50	06/28/11 17:50	06/30/11 12:11	7440-39-3	
Cadmium	**32.5**	mg/kg	0.096	20	06/28/11 17:50	06/29/11 15:06	7440-43-9	
Chromium	**6.5**	mg/kg	0.60	20	06/28/11 17:50	06/29/11 15:06	7440-47-3	
Copper	**4810**	mg/kg	11.9	400	06/28/11 17:50	06/30/11 12:14	7440-50-8	
Iron	**35900**	mg/kg	149	50	06/28/11 17:50	06/30/11 12:11	7439-89-6	
Lead	**8050**	mg/kg	2.4	400	06/28/11 17:50	06/30/11 12:14	7439-92-1	
Manganese	**342**	mg/kg	0.60	20	06/28/11 17:50	06/29/11 15:06	7439-96-5	
Nickel	**4.1**	mg/kg	0.60	20	06/28/11 17:50	06/29/11 15:06	7440-02-0	
Silver	**213**	mg/kg	0.60	20	06/28/11 17:50	06/29/11 15:06	7440-22-4	
Zinc	**1300**	mg/kg	119	400	06/28/11 17:50	06/30/11 12:14	7440-66-6	
7471 Mercury	Analytical Method: EPA 7471 Preparation Method: EPA 7471							
Mercury	**9.2**	mg/kg	0.60	20	06/27/11 11:04	06/27/11 15:37	7439-97-6	
Dry Weight	Analytical Method: % Moisture							
Percent Moisture	**35.1**	%	0.10	1		06/27/11 00:00		

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ANALYTICAL RESULTS

Project: Black Pine Mine
Pace Project No.: 10160756

Sample: CML-SD-13-00 **Lab ID: 10160756008** Collected: 06/16/11 09:20 Received: 06/17/11 08:50 Matrix: Solid

Results reported on a "dry-weight" basis

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
6020 MET ICPMS	Analytical Method: EPA 6020 Preparation Method: EPA 3050							
Antimony	**440**	mg/kg	0.71	20	06/28/11 17:50	06/29/11 15:09	7440-36-0	
Arsenic	**339**	mg/kg	0.71	20	06/28/11 17:50	06/29/11 15:09	7440-38-2	
Barium	**229**	mg/kg	0.43	20	06/28/11 17:50	06/29/11 15:09	7440-39-3	
Cadmium	**7.7**	mg/kg	0.11	20	06/28/11 17:50	06/29/11 15:09	7440-43-9	
Chromium	**7.5**	mg/kg	0.71	20	06/28/11 17:50	06/29/11 15:09	7440-47-3	
Copper	**1210**	mg/kg	1.8	50	06/28/11 17:50	06/30/11 12:17	7440-50-8	
Iron	**17300**	mg/kg	71.0	20	06/28/11 17:50	06/29/11 15:09	7439-89-6	
Lead	**1690**	mg/kg	2.8	400	06/28/11 17:50	06/30/11 12:21	7439-92-1	
Manganese	**741**	mg/kg	1.8	50	06/28/11 17:50	06/30/11 12:17	7439-96-5	
Nickel	**6.9**	mg/kg	0.71	20	06/28/11 17:50	06/29/11 15:09	7440-02-0	
Silver	**23.1**	mg/kg	0.71	20	06/28/11 17:50	06/29/11 15:09	7440-22-4	
Zinc	**257**	mg/kg	7.1	20	06/28/11 17:50	06/29/11 15:09	7440-66-6	
7471 Mercury	Analytical Method: EPA 7471 Preparation Method: EPA 7471							
Mercury	**17.4**	mg/kg	0.61	20	06/27/11 11:04	06/27/11 15:45	7439-97-6	
Dry Weight	Analytical Method: % Moisture							
Percent Moisture	**38.2**	%	0.10	1		06/27/11 00:00		

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ANALYTICAL RESULTS

Project: Black Pine Mine
Pace Project No.: 10160756

Sample: CML-SD-17-00 **Lab ID: 10160756009** Collected: 06/16/11 10:40 Received: 06/17/11 08:50 Matrix: Solid

Results reported on a "dry-weight" basis

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
6020 MET ICPMS	Analytical Method: EPA 6020 Preparation Method: EPA 3050							
Antimony	**1090**	mg/kg	8.0	200	06/28/11 17:50	06/30/11 12:28	7440-36-0	
Arsenic	**745**	mg/kg	1.0	25	06/28/11 17:50	06/30/11 12:24	7440-38-2	
Barium	**317**	mg/kg	0.48	20	06/28/11 17:50	06/29/11 13:37	7440-39-3	
Cadmium	**17.1**	mg/kg	0.13	20	06/28/11 17:50	06/29/11 13:37	7440-43-9	
Chromium	**3.8**	mg/kg	0.80	20	06/28/11 17:50	06/29/11 13:37	7440-47-3	
Copper	**1910**	mg/kg	8.0	200	06/28/11 17:50	06/30/11 12:28	7440-50-8	
Iron	**23800**	mg/kg	79.8	20	06/28/11 17:50	06/29/11 13:37	7439-89-6	
Lead	**3880**	mg/kg	1.6	200	06/28/11 17:50	06/30/11 12:28	7439-92-1	
Manganese	**325**	mg/kg	0.80	20	06/28/11 17:50	06/29/11 13:37	7439-96-5	
Nickel	**2.5**	mg/kg	0.80	20	06/28/11 17:50	06/29/11 13:37	7440-02-0	
Silver	**56.1**	mg/kg	0.80	20	06/28/11 17:50	06/29/11 13:37	7440-22-4	
Zinc	**496**	mg/kg	8.0	20	06/28/11 17:50	06/29/11 13:37	7440-66-6	
7471 Mercury	Analytical Method: EPA 7471 Preparation Method: EPA 7471							
Mercury	**10.5**	mg/kg	0.27	10	06/27/11 11:04	06/27/11 16:01	7439-97-6	
Dry Weight	Analytical Method: % Moisture							
Percent Moisture	**38.6**	%	0.10	1		06/27/11 00:00		

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ANALYTICAL RESULTS

Project: Black Pine Mine
Pace Project No.: 10160756

Sample: CML-SD-14-00 **Lab ID: 10160756010** Collected: 06/16/11 09:30 Received: 06/17/11 08:50 Matrix: Solid

Results reported on a "dry-weight" basis

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
6020 MET ICPMS	Analytical Method: EPA 6020 Preparation Method: EPA 3050							
Antimony	**1010**	mg/kg	6.8	200	06/28/11 17:50	06/30/11 12:55	7440-36-0	
Arsenic	**668**	mg/kg	0.84	25	06/28/11 17:50	06/30/11 12:31	7440-38-2	
Barium	**304**	mg/kg	0.41	20	06/28/11 17:50	06/29/11 13:40	7440-39-3	
Cadmium	**14.7**	mg/kg	0.11	20	06/28/11 17:50	06/29/11 13:40	7440-43-9	
Chromium	**4.9**	mg/kg	0.68	20	06/28/11 17:50	06/29/11 13:40	7440-47-3	
Copper	**2230**	mg/kg	6.8	200	06/28/11 17:50	06/30/11 12:55	7440-50-8	
Iron	**21700**	mg/kg	67.6	20	06/28/11 17:50	06/29/11 13:40	7439-89-6	
Lead	**3270**	mg/kg	1.4	200	06/28/11 17:50	06/30/11 12:55	7439-92-1	
Manganese	**257**	mg/kg	0.68	20	06/28/11 17:50	06/29/11 13:40	7439-96-5	
Nickel	**3.2**	mg/kg	0.68	20	06/28/11 17:50	06/29/11 13:40	7440-02-0	
Silver	**51.5**	mg/kg	0.68	20	06/28/11 17:50	06/29/11 13:40	7440-22-4	
Zinc	**403**	mg/kg	6.8	20	06/28/11 17:50	06/29/11 13:40	7440-66-6	
7471 Mercury	Analytical Method: EPA 7471 Preparation Method: EPA 7471							
Mercury	**7.7**	mg/kg	0.58	20	06/27/11 11:04	06/27/11 16:03	7439-97-6	
Dry Weight	Analytical Method: % Moisture							
Percent Moisture	**37.8**	%	0.10	1		06/27/11 00:00		

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ANALYTICAL RESULTS

Project: Black Pine Mine
Pace Project No.: 10160756

Sample: CML-SD-16-00 **Lab ID: 10160756011** Collected: 06/16/11 10:30 Received: 06/17/11 08:50 Matrix: Solid

Results reported on a "dry-weight" basis

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
6020 MET ICPMS	Analytical Method: EPA 6020 Preparation Method: EPA 3050							
Antimony	**2130**	mg/kg	2.9	100	06/28/11 17:50	06/30/11 12:58	7440-36-0	
Arsenic	**1670**	mg/kg	2.9	100	06/28/11 17:50	06/30/11 12:58	7440-38-2	
Barium	**492**	mg/kg	0.35	20	06/28/11 17:50	06/29/11 13:43	7440-39-3	
Cadmium	**26.6**	mg/kg	0.092	20	06/28/11 17:50	06/29/11 13:43	7440-43-9	
Chromium	**2.0**	mg/kg	0.58	20	06/28/11 17:50	06/29/11 13:43	7440-47-3	
Copper	**5170**	mg/kg	11.5	400	06/28/11 17:50	06/30/11 13:02	7440-50-8	
Iron	**27700**	mg/kg	288	100	06/28/11 17:50	06/30/11 12:58	7439-89-6	
Lead	**7330**	mg/kg	2.3	400	06/28/11 17:50	06/30/11 13:02	7439-92-1	
Manganese	**171**	mg/kg	0.58	20	06/28/11 17:50	06/29/11 13:43	7439-96-5	
Nickel	**0.69**	mg/kg	0.58	20	06/28/11 17:50	06/29/11 13:43	7440-02-0	
Silver	**73.1**	mg/kg	0.58	20	06/28/11 17:50	06/29/11 13:43	7440-22-4	
Zinc	**313**	mg/kg	5.8	20	06/28/11 17:50	06/29/11 13:43	7440-66-6	
7471 Mercury	Analytical Method: EPA 7471 Preparation Method: EPA 7471							
Mercury	**8.0**	mg/kg	0.56	20	06/27/11 11:04	06/27/11 16:05	7439-97-6	
Dry Weight	Analytical Method: % Moisture							
Percent Moisture	**31.0**	%	0.10	1		06/27/11 00:00		

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QUALITY CONTROL DATA

Project: Black Pine Mine
Pace Project No.: 10160756

QC Batch: MPRP/26758 Analysis Method: EPA 200.8
QC Batch Method: EPA 200.8 Analysis Description: 200.8 MET
Associated Lab Samples: 10160756001, 10160756002, 10160756003, 10160756004, 10160756005, 10160756006

METHOD BLANK: 999080 Matrix: Water
Associated Lab Samples: 10160756001, 10160756002, 10160756003, 10160756004, 10160756005, 10160756006

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Antimony	ug/L	<0.50	0.50	06/27/11 09:47	
Arsenic	ug/L	<0.50	0.50	06/27/11 09:47	
Barium	ug/L	<0.30	0.30	06/27/11 09:47	
Cadmium	ug/L	<0.080	0.080	06/27/11 09:47	
Chromium	ug/L	<0.50	0.50	06/27/11 09:47	
Copper	ug/L	<0.50	0.50	06/27/11 09:47	
Iron	ug/L	<50.0	50.0	06/27/11 09:47	
Lead	ug/L	<0.10	0.10	06/28/11 06:42	
Manganese	ug/L	<0.50	0.50	06/27/11 09:47	
Nickel	ug/L	<0.50	0.50	06/27/11 09:47	
Silver	ug/L	<0.50	0.50	06/27/11 09:47	
Zinc	ug/L	<5.0	5.0	06/27/11 09:47	

LABORATORY CONTROL SAMPLE: 999081

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Antimony	ug/L	80	77.9	97	85-115	
Arsenic	ug/L	80	74.6	93	85-115	
Barium	ug/L	80	80.6	101	85-115	
Cadmium	ug/L	80	82.5	103	85-115	
Chromium	ug/L	80	83.5	104	85-115	
Copper	ug/L	80	86.7	108	85-115	
Iron	ug/L	1000	1020	102	85-115	
Lead	ug/L	80	81.6	102	85-115	
Manganese	ug/L	80	79.2	99	85-115	
Nickel	ug/L	80	86.2	108	85-115	
Silver	ug/L	80	86.7	108	85-115	
Zinc	ug/L	80	86.2	108	85-115	

MATRIX SPIKE SAMPLE: 999082

Parameter	Units	9296528001 Result	Spike Conc.	MS Result	MS % Rec	% Rec Limits	Qualifiers
Antimony	ug/L	6.4	80	96.6	113	70-130	
Arsenic	ug/L	ND	80	90.0	112	70-130	
Barium	ug/L	62.8	80	149	108	70-130	
Cadmium	ug/L	1.9	80	92.4	113	70-130	
Chromium	ug/L	4.9	80	96.0	114	70-130	
Copper	ug/L	131	80	215	106	70-130	
Iron	ug/L	1990	1000	3730	174	70-130	M0
Lead	ug/L	48.3	80	133	105	70-130	

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QUALITY CONTROL DATA

Project: Black Pine Mine
Pace Project No.: 10160756

MATRIX SPIKE SAMPLE: 999082

Parameter	Units	9296528001 Result	Spike Conc.	MS Result	MS % Rec	% Rec Limits	Qualifiers
Manganese	ug/L	155	80	241	107	70-130	
Nickel	ug/L	5.9	80	98.6	116	70-130	
Silver	ug/L	ND	80	48.8	60	70-130	M1
Zinc	ug/L	351	80	431	100	70-130	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 1001302 1001303

Parameter	Units	10160756005 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Antimony	ug/L	3.4	80	80	85.2	84.7	102	102	70-130	.5	20	
Arsenic	ug/L	1.7	80	80	82.1	83.7	101	102	70-130	2	20	
Barium	ug/L	36.6	80	80	119	120	103	104	70-130	.7	20	
Cadmium	ug/L	0.15	80	80	82.7	83.0	103	104	70-130	.3	20	
Chromium	ug/L	0.83	80	80	85.2	85.2	105	105	70-130	0	20	
Copper	ug/L	17.4	80	80	103	104	107	108	70-130	.4	20	
Iron	ug/L	617	1000	1000	1930	1490	131	88	70-130	26	20	D6,M0
Lead	ug/L	3.8	80	80	85.7	86.1	102	103	70-130	.5	20	
Manganese	ug/L	7.1	80	80	90.4	88.3	104	102	70-130	2	20	
Nickel	ug/L	0.88	80	80	86.9	88.2	107	109	70-130	1	20	
Silver	ug/L	<0.50	80	80	86.8	87.9	108	109	70-130	1	20	
Zinc	ug/L	14.2	80	80	97.6	101	104	108	70-130	3	20	

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QUALITY CONTROL DATA

Project: Black Pine Mine
Pace Project No.: 10160756

QC Batch: MPRP/26730 Analysis Method: EPA 6020
QC Batch Method: EPA 3050 Analysis Description: 6020 MET
Associated Lab Samples: 10160756007, 10160756008, 10160756009, 10160756010, 10160756011

METHOD BLANK: 998309 Matrix: Solid
Associated Lab Samples: 10160756007, 10160756008, 10160756009, 10160756010, 10160756011

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Antimony	mg/kg	<0.47	0.47	06/29/11 13:57	
Arsenic	mg/kg	<0.47	0.47	06/29/11 13:57	
Barium	mg/kg	<0.28	0.28	06/29/11 13:57	
Cadmium	mg/kg	<0.075	0.075	06/29/11 13:57	
Chromium	mg/kg	<0.47	0.47	06/29/11 13:57	
Copper	mg/kg	<0.47	0.47	06/29/11 13:57	
Iron	mg/kg	<47.2	47.2	06/29/11 13:57	
Lead	mg/kg	<0.094	0.094	06/29/11 13:57	
Manganese	mg/kg	<0.47	0.47	06/29/11 13:57	
Nickel	mg/kg	<0.47	0.47	06/29/11 13:57	
Silver	mg/kg	<0.47	0.47	06/30/11 11:25	
Zinc	mg/kg	<4.7	4.7	06/29/11 13:57	

LABORATORY CONTROL SAMPLE: 998310

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Antimony	mg/kg	20	21.7	109	75-125	
Arsenic	mg/kg	20	22.2	111	75-125	
Barium	mg/kg	20	21.3	107	75-125	
Cadmium	mg/kg	20	21.2	106	75-125	
Chromium	mg/kg	20	22.0	110	75-125	
Copper	mg/kg	20	22.8	114	75-125	
Iron	mg/kg	250	288	115	75-125	
Lead	mg/kg	20	21.0	105	75-125	
Manganese	mg/kg	20	22.0	110	75-125	
Nickel	mg/kg	20	21.6	108	75-125	
Silver	mg/kg	20	22.5	113	75-125	
Zinc	mg/kg	20	22.0	110	75-125	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 998311 998312

Parameter	Units	10160501002 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Antimony	mg/kg	ND	22.4	21.2	18.0	15.6	79	72	75-125	15	20	M6
Arsenic	mg/kg	6.5	22.4	21.2	29.1	27.5	101	99	75-125	6	20	
Barium	mg/kg	28.1	22.4	21.2	63.6	70.5	159	201	75-125	10	20	M6
Cadmium	mg/kg	0.14	22.4	21.2	22.6	21.8	100	102	75-125	4	20	
Chromium	mg/kg	38.7	22.4	21.2	66.1	69.4	122	145	75-125	5	20	M6
Copper	mg/kg	31.9	22.4	21.2	65.4	58.1	150	124	75-125	12	20	M6
Iron	mg/kg	44900	280	264	37800	40300	-2540	-1740	75-125	6	20	M6

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QUALITY CONTROL DATA

Project: Black Pine Mine
Pace Project No.: 10160756

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 998311 998312

Parameter	Units	10160501002 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Lead	mg/kg	4.1	22.4	21.2	26.7	27.9	101	113	75-125	4	20	
Manganese	mg/kg	1600	22.4	21.2	1920	1910	1420	1490	75-125	.2	20	E,M6
Nickel	mg/kg	16.6	22.4	21.2	42.7	41.0	116	116	75-125	4	20	
Silver	mg/kg	ND	22.4	21.2	24.3	22.8	107	106	75-125	6	20	
Zinc	mg/kg	36.4	22.4	21.2	67.6	62.6	139	124	75-125	8	20	M6

MATRIX SPIKE SAMPLE: 998313

Parameter	Units	258133003 Result	Spike Conc.	MS Result	MS % Rec	% Rec Limits	Qualifiers
Antimony	mg/kg	ND	24.3	16.9	68	75-125	M6
Arsenic	mg/kg	2.9	24.3	27.9	102	75-125	
Barium	mg/kg	51.0	24.3	81.6	126	75-125	M6
Cadmium	mg/kg	ND	24.3	22.7	93	75-125	
Chromium	mg/kg	26.6	24.3	51.7	103	75-125	
Copper	mg/kg	17.4	24.3	44.9	113	75-125	
Iron	mg/kg	19000	305	20600	523	75-125	M6
Lead	mg/kg	8.5	24.3	34.1	105	75-125	
Manganese	mg/kg	272	24.3	313	170	75-125	M6
Nickel	mg/kg	29.4	24.3	52.2	94	75-125	
Silver	mg/kg	ND	24.3	25.0	102	75-125	
Zinc	mg/kg	39.4	24.3	68.6	120	75-125	

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QUALITY CONTROL DATA

Project: Black Pine Mine
Pace Project No.: 10160756

QC Batch: MERP/5556 Analysis Method: EPA 7471
QC Batch Method: EPA 7471 Analysis Description: 7471 Mercury
Associated Lab Samples: 10160756007, 10160756008, 10160756009, 10160756010, 10160756011

METHOD BLANK: 1000718 Matrix: Solid
Associated Lab Samples: 10160756007, 10160756008, 10160756009, 10160756010, 10160756011

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Mercury	mg/kg	<0.019	0.019	06/27/11 15:11	

LABORATORY CONTROL SAMPLE: 1000719

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Mercury	mg/kg	.44	0.48	108	80-120	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 1000720 1000721

Parameter	Units	10160647003 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Mercury	mg/kg	<0.023	.57	.5	0.59	0.51	103	103	80-120	15	20	

MATRIX SPIKE SAMPLE: 1000722

Parameter	Units	10161056004 Result	Spike Conc.	MS Result	MS % Rec	% Rec Limits	Qualifiers
Mercury	mg/kg	0.71	.46	0.92	46	80-120	M1

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QUALITY CONTROL DATA

Project: Black Pine Mine
Pace Project No.: 10160756

QC Batch: MPRP/26864 Analysis Method: % Moisture
QC Batch Method: % Moisture Analysis Description: Dry Weight/Percent Moisture
Associated Lab Samples: 10160756007, 10160756008, 10160756009, 10160756010, 10160756011

SAMPLE DUPLICATE: 1003029

Parameter	Units	10160673011 Result	Dup Result	RPD	Max RPD	Qualifiers
Percent Moisture	%	21.0	21.1	.5	30	

SAMPLE DUPLICATE: 1003030

Parameter	Units	10160756011 Result	Dup Result	RPD	Max RPD	Qualifiers
Percent Moisture	%	31.0	34.4	10	30	

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QUALITY CONTROL DATA

Project: Black Pine Mine
Pace Project No.: 10160756

QC Batch: MT/6229 Analysis Method: SM 2310
QC Batch Method: SM 2310 Analysis Description: 2310 Acidity
Associated Lab Samples: 10160756001, 10160756002, 10160756003, 10160756005, 10160756006

METHOD BLANK: 1001046 Matrix: Water
Associated Lab Samples: 10160756001, 10160756002, 10160756003, 10160756005, 10160756006

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Acidity	mg/L	<5.0	5.0	06/24/11 16:55	

SAMPLE DUPLICATE: 1001047

Parameter	Units	10160709001 Result	Dup Result	RPD	Max RPD	Qualifiers
Acidity	mg/L	<5.0	<5.0		20	

SAMPLE DUPLICATE: 1001048

Parameter	Units	10160994002 Result	Dup Result	RPD	Max RPD	Qualifiers
Acidity	mg/L	<5.0	<5.0		20	

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(406)254-7226

QUALITY CONTROL DATA

Project: Black Pine Mine
Pace Project No.: 10160756

QC Batch: MT/6193 Analysis Method: SM 2540D
QC Batch Method: SM 2540D Analysis Description: 2540D Total Suspended Solids
Associated Lab Samples: 10160756001, 10160756002, 10160756003, 10160756005, 10160756006

METHOD BLANK: 998567 Matrix: Water
Associated Lab Samples: 10160756001, 10160756002, 10160756003, 10160756005, 10160756006

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Total Suspended Solids	mg/L	<1.0	1.0	06/21/11 16:47	

LABORATORY CONTROL SAMPLE: 998566

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Total Suspended Solids	mg/L	25	27.0	108	71-129	

SAMPLE DUPLICATE: 998935

Parameter	Units	10160709001 Result	Dup Result	RPD	Max RPD	Qualifiers
Total Suspended Solids	mg/L	2.4	4.6	63	20	R3

SAMPLE DUPLICATE: 998936

Parameter	Units	10160709003 Result	Dup Result	RPD	Max RPD	Qualifiers
Total Suspended Solids	mg/L	65.6	70.0	6	20	

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QUALITY CONTROL DATA

Project: Black Pine Mine
Pace Project No.: 10160756

QC Batch: MT/6256 Analysis Method: EPA 300.0
QC Batch Method: EPA 300.0 Analysis Description: 300.0 IC Anions
Associated Lab Samples: 10160756001, 10160756002, 10160756003, 10160756005

METHOD BLANK: 1003183 Matrix: Water
Associated Lab Samples: 10160756001, 10160756002, 10160756003, 10160756005

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Sulfate	mg/L	<1.0	1.0	06/28/11 05:10	

LABORATORY CONTROL SAMPLE: 1003184

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Sulfate	mg/L	20	20.6	103	90-110	

MATRIX SPIKE SAMPLE: 1003185

Parameter	Units	10160484002 Result	Spike Conc.	MS Result	MS % Rec	% Rec Limits	Qualifiers
Sulfate	mg/L	11.3	20	32.5	106	80-120	

MATRIX SPIKE SAMPLE: 1003187

Parameter	Units	10160484013 Result	Spike Conc.	MS Result	MS % Rec	% Rec Limits	Qualifiers
Sulfate	mg/L	33.0	40	78.2	113	80-120	

SAMPLE DUPLICATE: 1003186

Parameter	Units	10160484004 Result	Dup Result	RPD	Max RPD	Qualifiers
Sulfate	mg/L	9.0	9.0	.6	20	

SAMPLE DUPLICATE: 1003188

Parameter	Units	10160484015 Result	Dup Result	RPD	Max RPD	Qualifiers
Sulfate	mg/L	14.5	14.5	.08	20	

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QUALITY CONTROL DATA

Project: Black Pine Mine
Pace Project No.: 10160756

QC Batch: MT/6264
QC Batch Method: EPA 300.0
Analysis Method: EPA 300.0
Analysis Description: 300.0 IC Anions
Associated Lab Samples: 10160756006

METHOD BLANK: 1003621 Matrix: Water
Associated Lab Samples: 10160756006

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Sulfate	mg/L	<1.0	1.0	06/29/11 00:15	

LABORATORY CONTROL SAMPLE: 1003622

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Sulfate	mg/L	20	21.9	109	90-110	

MATRIX SPIKE SAMPLE: 1003623

Parameter	Units	10160756006 Result	Spike Conc.	MS Result	MS % Rec	% Rec Limits	Qualifiers
Sulfate	mg/L	3.5	20	22.7	96	80-120	

MATRIX SPIKE SAMPLE: 1003625

Parameter	Units	10161006001 Result	Spike Conc.	MS Result	MS % Rec	% Rec Limits	Qualifiers
Sulfate	mg/L	845	1000	1880	103	80-120	

SAMPLE DUPLICATE: 1003626

Parameter	Units	10161006001 Result	Dup Result	RPD	Max RPD	Qualifiers
Sulfate	mg/L	845	837	1	20	

SAMPLE DUPLICATE: 1005216

Parameter	Units	10160956001 Result	Dup Result	RPD	Max RPD	Qualifiers
Sulfate	mg/L	134	137	2	20	

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QUALITY CONTROL DATA

Project: Black Pine Mine
Pace Project No.: 10160756

QC Batch: WET/22702 Analysis Method: SM 2320B
QC Batch Method: SM 2320B Analysis Description: 2320B Alkalinity
Associated Lab Samples: 10160756001, 10160756002, 10160756003, 10160756005, 10160756006

METHOD BLANK: 1000790 Matrix: Water
Associated Lab Samples: 10160756001, 10160756002, 10160756003, 10160756005, 10160756006

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Alkalinity, Total as CaCO3	mg/L	<5.0	5.0	06/23/11 13:05	

LABORATORY CONTROL SAMPLE & LCSD: 1000791 1000792

Parameter	Units	Spike Conc.	LCS Result	LCSD Result	LCS % Rec	LCSD % Rec	% Rec Limits	RPD	Max RPD	Qualifiers
Alkalinity, Total as CaCO3	mg/L	40	38.8	39.3	97	98	90-110	2	30	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 1000793 1000794

Parameter	Units	10160702001 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Alkalinity, Total as CaCO3	mg/L	220	40	40	263	265	106	111	80-120	.8	30	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 1000795 1000796

Parameter	Units	10161012002 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Alkalinity, Total as CaCO3	mg/L	270	40	40	323	317	133	117	80-120	2	30	M1

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QUALITY CONTROL DATA

Project: Black Pine Mine
Pace Project No.: 10160756

QC Batch: WET/22692 Analysis Method: SM 2540C
QC Batch Method: SM 2540C Analysis Description: 2540C Total Dissolved Solids
Associated Lab Samples: 10160756001, 10160756002, 10160756003, 10160756005, 10160756006

METHOD BLANK: 999964 Matrix: Water
Associated Lab Samples: 10160756001, 10160756002, 10160756003, 10160756005, 10160756006

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Total Dissolved Solids	mg/L	<10.0	10.0	06/22/11 11:26	

LABORATORY CONTROL SAMPLE: 999965

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Total Dissolved Solids	mg/L	1000	998	100	80-120	

SAMPLE DUPLICATE: 999966

Parameter	Units	10160655005 Result	Dup Result	RPD	Max RPD	Qualifiers
Total Dissolved Solids	mg/L	34.0	29.0	16	20	

SAMPLE DUPLICATE: 999967

Parameter	Units	10160655006 Result	Dup Result	RPD	Max RPD	Qualifiers
Total Dissolved Solids	mg/L	34.0	32.0	6	20	

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QUALIFIERS

Project: Black Pine Mine
Pace Project No.: 10160756

DEFINITIONS

DF - Dilution Factor, if reported, represents the factor applied to the reported data due to changes in sample preparation, dilution of the sample aliquot, or moisture content.

ND - Not Detected at or above adjusted reporting limit.

J - Estimated concentration above the adjusted method detection limit and below the adjusted reporting limit.

MDL - Adjusted Method Detection Limit.

S - Surrogate

1,2-Diphenylhydrazine (8270 listed analyte) decomposes to Azobenzene.

Consistent with EPA guidelines, unrounded data are displayed and have been used to calculate % recovery and RPD values.

LCS(D) - Laboratory Control Sample (Duplicate)

MS(D) - Matrix Spike (Duplicate)

DUP - Sample Duplicate

RPD - Relative Percent Difference

NC - Not Calculable.

SG - Silica Gel - Clean-Up

U - Indicates the compound was analyzed for, but not detected.

N-Nitrosodiphenylamine decomposes and cannot be separated from Diphenylamine using Method 8270. The result reported for each analyte is a combined concentration.

LABORATORIES

PASI-M	Pace Analytical Services - Minneapolis
PASI-MT	Pace Analytical Services - Montana

ANALYTE QUALIFIERS

D6	The relative percent difference (RPD) between the sample and sample duplicate exceeded laboratory control limits.
E	Analyte concentration exceeded the calibration range. The reported result is estimated.
M0	Matrix spike recovery and/or matrix spike duplicate recovery was outside laboratory control limits.
M1	Matrix spike recovery exceeded QC limits. Batch accepted based on laboratory control sample (LCS) recovery.
M6	Matrix spike and Matrix spike duplicate recovery not evaluated against control limits due to sample dilution.
R3	RPD value was outside control limits due to uncertainty of values at or near the PRL.

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QUALITY CONTROL DATA CROSS REFERENCE TABLE

Project: Black Pine Mine
Pace Project No.: 10160756

Lab ID	Sample ID	QC Batch Method	QC Batch	Analytical Method	Analytical Batch
10160756001	**CML-SW-14**	EPA 200.8	MPRP/26758	EPA 200.8	ICPM/10909
10160756002	**CML-SW-19**	EPA 200.8	MPRP/26758	EPA 200.8	ICPM/10909
10160756003	**CML-SW-02**	EPA 200.8	MPRP/26758	EPA 200.8	ICPM/10909
10160756004	**CML-Q1-T2**	EPA 200.8	MPRP/26758	EPA 200.8	ICPM/10909
10160756005	**CML-SW-01**	EPA 200.8	MPRP/26758	EPA 200.8	ICPM/10909
10160756006	**CML-SW-09**	EPA 200.8	MPRP/26758	EPA 200.8	ICPM/10909
10160756007	**CML-SD-15-00**	EPA 3050	MPRP/26730	EPA 6020	ICPM/10932
10160756008	**CML-SD-13-00**	EPA 3050	MPRP/26730	EPA 6020	ICPM/10932
10160756009	**CML-SD-17-00**	EPA 3050	MPRP/26730	EPA 6020	ICPM/10932
10160756010	**CML-SD-14-00**	EPA 3050	MPRP/26730	EPA 6020	ICPM/10932
10160756011	**CML-SD-16-00**	EPA 3050	MPRP/26730	EPA 6020	ICPM/10932
10160756007	**CML-SD-15-00**	EPA 7471	MERP/5556	EPA 7471	MERC/6376
10160756008	**CML-SD-13-00**	EPA 7471	MERP/5556	EPA 7471	MERC/6376
10160756009	**CML-SD-17-00**	EPA 7471	MERP/5556	EPA 7471	MERC/6376
10160756010	**CML-SD-14-00**	EPA 7471	MERP/5556	EPA 7471	MERC/6376
10160756011	**CML-SD-16-00**	EPA 7471	MERP/5556	EPA 7471	MERC/6376
10160756007	**CML-SD-15-00**	% Moisture	MPRP/26864		
10160756008	**CML-SD-13-00**	% Moisture	MPRP/26864		
10160756009	**CML-SD-17-00**	% Moisture	MPRP/26864		
10160756010	**CML-SD-14-00**	% Moisture	MPRP/26864		
10160756011	**CML-SD-16-00**	% Moisture	MPRP/26864		
10160756001	**CML-SW-14**	SM 2310	MT/6229		
10160756002	**CML-SW-19**	SM 2310	MT/6229		
10160756003	**CML-SW-02**	SM 2310	MT/6229		
10160756005	**CML-SW-01**	SM 2310	MT/6229		
10160756006	**CML-SW-09**	SM 2310	MT/6229		
10160756001	**CML-SW-14**	SM 2540D	MT/6193		
10160756002	**CML-SW-19**	SM 2540D	MT/6193		
10160756003	**CML-SW-02**	SM 2540D	MT/6193		
10160756005	**CML-SW-01**	SM 2540D	MT/6193		
10160756006	**CML-SW-09**	SM 2540D	MT/6193		
10160756001	**CML-SW-14**	EPA 300.0	MT/6256		
10160756002	**CML-SW-19**	EPA 300.0	MT/6256		
10160756003	**CML-SW-02**	EPA 300.0	MT/6256		
10160756005	**CML-SW-01**	EPA 300.0	MT/6256		
10160756006	**CML-SW-09**	EPA 300.0	MT/6264		
10160756001	**CML-SW-14**	SM 2320B	WET/22702		
10160756002	**CML-SW-19**	SM 2320B	WET/22702		
10160756003	**CML-SW-02**	SM 2320B	WET/22702		
10160756005	**CML-SW-01**	SM 2320B	WET/22702		
10160756006	**CML-SW-09**	SM 2320B	WET/22702		
10160756001	**CML-SW-14**	SM 2540C	WET/22692		
10160756002	**CML-SW-19**	SM 2540C	WET/22692		
10160756003	**CML-SW-02**	SM 2540C	WET/22692		

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QUALITY CONTROL DATA CROSS REFERENCE TABLE

Project: Black Pine Mine
Pace Project No.: 10160756

Lab ID	Sample ID	QC Batch Method	QC Batch	Analytical Method	Analytical Batch
10160756005	**CML-SW-01**	SM 2540C	WET/22692		
10160756006	**CML-SW-09**	SM 2540C	WET/22692		

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CHAIN-OF-CUSTODY / Analytical Request Document

The Chain-of-Custody is a LEGAL DOCUMENT. All relevant fields must be completed accurately.

Page: 1 of 1

1321623

Section A Required Client Information:	Section B Required Project Information:	Section C Invoice Information:
Company: Herrera	Report To: Kevin Hoult	Attention:
Address:	Copy To:	Company Name: DEQ
		Address:
Email To:	Purchase Order No.:	Pace Quote Reference:
Phone: Fax:	Project Name: Black Pine Mine	Pace Project Manager:
Requested Due Date/TAT:	Project Number:	Pace Profile #:

REGULATORY AGENCY

☐ NPDES ☐ GROUND WATER ☐ DRINKING WATER

☐ UST ☐ RCRA ☐ OTHER _____

Site Location STATE: _____

Section D Required Client Information

SAMPLE ID
(A-Z, 0-9 / ,-)
Sample IDs MUST BE UNIQUE

Matrix Codes (MATRIX / CODE): Drinking Water DW; Water WT; Waste Water WW; Product P; Soil/Solid SL; Oil OL; Wipe WP; Air AR; Tissue TS; Other OT

Requested Analysis Filtered (Y/N)

ITEM #	SAMPLE ID	MATRIX CODE (see valid codes to left)	SAMPLE TYPE (G=GRAB C=COMP)	COLLECTED: COMPOSITE START DATE	COMPOSITE START TIME	COMPOSITE END/GRAB DATE	COMPOSITE END/GRAB TIME	SAMPLE TEMP AT COLLECTION	# OF CONTAINERS	Preservatives: Unpreserved	H_2SO_4	HNO_3	HCl	NaOH	$Na_2S_2O_3$	Methanol	Other	Analysis Test Y/N	TSS	Alk, sulfate	Acidity, sulfate	Total Metals (Solid)									Residual Chlorine (Y/N)	Pace Project No./ Lab I.D.
																			N	N	N	Y	N								
1	CML-SW-14	W	G			6/15/11	~~13:15~~		4	X		X							X	X	X	X								001
2	CML-SW-19						1259		4	X		X							X	X	X	X								002
3	CML-SW-02						1403		4	X		X							X	X	X	X								003
4	CML-Q1-T2						1403		1			X										X								004
5	CML-SW-01						1549		4	X		X							X	X	X	X								005
6	CML-SW-09					↓	1513		4	X		X							X	X	X	X								006
7	CML-SD-15-00	S	G			6/14/11	0955		1	X													X							007
8	CML-SD-13-00						0920		1	X													X							008
9	CML-SD-17-00						1040		1	X													X							009
10	CML-SD-14-00						0930		1	X													X							010
11	CML-SD-16-00	↓	↓				1030		1	X													X							011
12																														

Residual Chlorine (Y/N): Y/N 6-7-11

ADDITIONAL COMMENTS	RELINQUISHED BY / AFFILIATION	DATE	TIME	ACCEPTED BY / AFFILIATION	DATE	TIME	SAMPLE CONDITIONS
All "SML" on bottles should be "CML"	[signature] / Herrera	6/16/11	1130	[signature] PACE	6/17/11		
							4.6° / Y / Y / Y

Temp in °C | Received on Ice (Y/N) | Custody Sealed Cooler (Y/N) | Samples Intact (Y/N)

ORIGINAL

SAMPLER NAME AND SIGNATURE

PRINT Name of SAMPLER: Gina Catarra

SIGNATURE of SAMPLER: [signature] DATE Signed (MM/DD/YY): 6/16/11

*Important Note: By signing this form you are accepting Pace's NET 30 day payment terms and agreeing to late charges of 1.5% per month for any invoices not paid within 30 days.

F-ALL-Q-020rev.07, 15-May-2007

Sample Condition Upon Receipt

Pace Analytical

Client Name: DEQ

Project # 10160756

(67)

Courier: ☒ Fed Ex ☐ UPS ☐ USPS ☐ Client ☐ Commercial ☐ Pace Other _____

Tracking #: 879718460013561

Custody Seal on Cooler/Box Present: ☒ yes ☐ no Seals intact: ☒ yes ☐ no

Packing Material: ☒ Bubble Wrap ☐ Bubble Bags ☐ None ☒ Other absorbent pad Temp Blank: Yes ☒ No ____

Thermometer Used 1383045 or 135 Type of Ice: (Wet) Blue None ☒ Samples on ice, cooling process has begun

Cooler Temperature 4.6 Biological Tissue is Frozen: Yes No

Temp should be above freezing to 6°C

Comments:

Date and Initials of person examining contents: RW 6/17/11

Chain of Custody Present:	☒Yes ☐No ☐N/A	1.
Chain of Custody Filled Out:	☒Yes ☐No ☐N/A	2.
Chain of Custody Relinquished:	☒Yes ☐No ☐N/A	3.
Sampler Name & Signature on COC:	☒Yes ☐No ☐N/A	4.
Samples Arrived within Hold Time:	☒Yes ☐No ☐N/A	5.
Short Hold Time Analysis (<72hr):	RW 6/17/11 ☒Yes ☐No ☐N/A	6.
Rush Turn Around Time Requested:	☐Yes ☒No ☐N/A	7.
Sufficient Volume:	☒Yes ☐No ☐N/A	8.
Correct Containers Used:	☒Yes ☐No ☐N/A	9.
-Pace Containers Used:	☒Yes ☐No ☐N/A	
Containers Intact:	☒Yes ☐No ☐N/A	10.
Filtered volume received for Dissolved tests	☐Yes ☐No ☒N/A	11.
Sample Labels match COC:	☐Yes ☒No ☐N/A	12: Per client !!! All "SML" on bottles should be "CML" !!!
-Includes date/time/ID/Analysis Matrix: Aq, SL		
All containers needing acid/base preservation have been checked. Noncompliance are noted in 13.	☒Yes ☐No ☐N/A	13. ☒ HNO3 ☐ H2SO4 ☐ NaOH ☐ HCl
All containers needing preservation are found to be in compliance with EPA recommendation.	☒Yes ☐No ☐N/A	Samp # 1-6 (1/1)
Exceptions: VOA,Coliform, TOC, Oil and Grease, WI-DRO (water)	RW to 2 ☒Yes ☒No	Initial when completed RW / Lot # of added preservative
Samples checked for dechlorination:	☐Yes ☐No ☒N/A	14.
Headspace in VOA Vials (>6mm):	☐Yes ☐No ☒N/A	15.
Trip Blank Present:	☐Yes ☐No ☒N/A	16.
Trip Blank Custody Seals Present	☐Yes ☐No ☒N/A	
Pace Trip Blank Lot # (if purchased):		

Client Notification/ Resolution: Field Data Required? Y / N

Person Contacted: _____ Date/Time: _____

Comments/ Resolution: _____

Project Manager Review: _____ **Date:** 6/17/11

Note: Whenever there is a discrepancy affecting North Carolina compliance samples, a copy of this form will be sent to the North Carolina DEHNR Certification Office (i.e out of hold, incorrect preservative, out of temp, incorrect containers)

Pace Analytical Services, Inc.
602 S 25th Street
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(406)254-7226

August 10, 2011

Kevin Houck
Herrera Environmental Consultants
101 East Broadway, Suite 610
Missoula, MT 59802

RE: Project: Black Pine Mine
Pace Project No.: 10163246

Dear Kevin Houck:
Enclosed are the analytical results for sample(s) received by the laboratory on July 13, 2011. The results relate only to the samples included in this report.

If you have any questions concerning this report, please feel free to contact me.

Sincerely,

Sally Heinje

sally.heinje@pacelabs.com
Project Manager

Enclosures

cc: Devin Clary, Montana Dept. of Environmental Quality
Mark Donner, Trihydro

REPORT OF LABORATORY ANALYSIS

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CERTIFICATIONS

Project: Black Pine Mine
Pace Project No.: 10163246

Minnesota Certification IDs

1700 Elm Street SE Suite 200, Minneapolis, MN 55414
A2LA Certification #: 2926.01
Alaska Certification #: UST-078
Alaska Certification #MN00064
Arizona Certification #: AZ-0014
Arkansas Certification #: 88-0680
California Certification #: 01155CA
EPA Region 8 Certification #: Pace
Florida/NELAP Certification #: E87605
Georgia Certification #: 959
Idaho Certification #: MN00064
Illinois Certification #: 200011
Iowa Certification #: 368
Kansas Certification #: E-10167
Louisiana Certification #: 03086
Louisiana Certification #: LA080009
Maine Certification #: 2007029
Maryland Certification #: 322
Michigan DEQ Certification #: 9909
Minnesota Certification #: 027-053-137
Mississippi Certification #: Pace
Montana Certification #: MT CERT0092
Nevada Certification #: MN_00064
Nebraska Certification #: Pace
New Jersey Certification #: MN-002
New Mexico Certification #: Pace
New York Certification #: 11647
North Carolina Certification #: 530
North Dakota Certification #: R-036
North Dakota Certification #: R-036A
Ohio VAP Certification #: CL101
Oklahoma Certification #: D9921
Oklahoma Certification #: 9507
Oregon Certification #: MN200001
Pennsylvania Certification #: 68-00563
Puerto Rico Certification
Tennessee Certification #: 02818
Texas Certification #: T104704192
Washington Certification #: C754
Wisconsin Certification #: 999407970

Montana Certification IDs

602 South 25th Street, Billings, MT 59101
EPA Region 8 Certification #: 8TMS-Q
Idaho Certification #: MT00012
Montana Certification #: MT CERT0040
NVLAP Certification #: 101292-0
Minnesota Dept of Health Certification #: 030-999-442

Kansas Certification IDs

9608 Loiret Boulevard, Lenexa, KS 66219
A2LA Certification #: 2456.01
Arkansas Certification #: 05-008-0
Illinois Certification #: 001191
Iowa Certification #: 118
Kansas/NELAP Certification #: E-10116
Louisiana Certification #: 03055
Nevada Certification #: KS000212008A
Oklahoma Certification #: 9205/9935
Texas Certification #: T104704407-08-TX
Utah Certification #: 9135995665

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Billings, MT 591014549
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SAMPLE SUMMARY

Project: Black Pine Mine
Pace Project No.: 10163246

Lab ID	Sample ID	Matrix	Date Collected	Date Received
10163246001	**BP-RY-SS-02-00**	Solid	07/12/11 08:50	07/13/11 09:00
10163246002	**BP-RY-SS-01-00**	Solid	07/12/11 09:18	07/13/11 09:00
10163246003	**BP-RY-SS-03-00**	Solid	07/12/11 10:25	07/13/11 09:00
10163246004	**BP-RY-SS-03-14**	Solid	07/12/11 10:28	07/13/11 09:00
10163246005	**BP-RY-SS-02-02**	Solid	07/12/11 08:55	07/13/11 09:00
10163246006	**BP-RY-SS-04-00**	Solid	07/12/11 11:28	07/13/11 09:00
10163246007	**BP-RY-SS-04-02**	Solid	07/12/11 11:30	07/13/11 09:00
10163246008	**BP-RY-SS-04-10**	Solid	07/12/11 11:33	07/13/11 09:00
10163246009	**BP-RY-SS-05-00**	Solid	07/12/11 12:28	07/13/11 09:00
10163246010	**BP-RY-SS-05-02**	Solid	07/12/11 12:30	07/13/11 09:00

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SAMPLE ANALYTE COUNT

Project: Black Pine Mine
Pace Project No.: 10163246

Lab ID	Sample ID	Method	Analysts	Analytes Reported	Laboratory
10163246001	**BP-RY-SS-02-00**	CLPICPAES	IP	1	PASI-M
		EPA 9081	SMW	1	PASI-K
		EPA 6020	CJS	12	PASI-M
		EPA 7471	TEM	1	PASI-M
		% Moisture	JDL	1	PASI-M
		ASA 33-3.2/EPA 353.2	CAC	1	PASI-MT
		ASTM D421	CAC	1	PASI-MT
		ASA 29-3.5.2	CAC	1	PASI-MT
		ASA 10-3.2	CAC	1	PASI-MT
		ASA 24-5.4/SM4500	SA1	1	PASI-MT
		Modified Sobek 3.2	JH1	1	PASI-MT
		Modified Sobek 3.2	JH1	5	PASI-MT
		Modified Sobek 3.2	JH1	4	PASI-MT
		Modified Sobek 3.2	JH1	1	PASI-MT
		ASA 10-3.3	SR1	1	PASI-MT
10163246002	**BP-RY-SS-01-00**	CLPICPAES	IP	1	PASI-M
		EPA 9081	SMW	1	PASI-K
		EPA 6020	CJS	12	PASI-M
		EPA 7471	TEM	1	PASI-M
		% Moisture	JDL	1	PASI-M
		ASA 33-3.2/EPA 353.2	CAC	1	PASI-MT
		ASTM D421	CAC	1	PASI-MT
		ASA 29-3.5.2	CAC	1	PASI-MT
		ASA 10-3.2	CAC	1	PASI-MT
		ASA 24-5.4/SM4500	SA1	1	PASI-MT
		Modified Sobek 3.2	JH1	1	PASI-MT
		Modified Sobek 3.2	JH1	5	PASI-MT
		Modified Sobek 3.2	JH1	4	PASI-MT
		Modified Sobek 3.2	JH1	1	PASI-MT
		ASA 10-3.3	SR1	1	PASI-MT
10163246003	**BP-RY-SS-03-00**	CLPICPAES	IP	1	PASI-M
		EPA 9081	SMW	1	PASI-K
		EPA 6020	CJS	12	PASI-M
		EPA 7471	TEM	1	PASI-M
		% Moisture	JDL	1	PASI-M
		ASA 33-3.2/EPA 353.2	CAC	1	PASI-MT
		ASTM D421	CAC	1	PASI-MT

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SAMPLE ANALYTE COUNT

Project: Black Pine Mine
Pace Project No.: 10163246

Lab ID	Sample ID	Method	Analysts	Analytes Reported	Laboratory
		ASA 29-3.5.2	CAC	1	PASI-MT
		ASA 10-3.2	CAC	1	PASI-MT
		ASA 24-5.4/SM4500	SA1	1	PASI-MT
		Modified Sobek 3.2	JH1	1	PASI-MT
		Modified Sobek 3.2	JH1	5	PASI-MT
		Modified Sobek 3.2	JH1	4	PASI-MT
		Modified Sobek 3.2	JH1	1	PASI-MT
		ASA 10-3.3	SR1	1	PASI-MT
10163246004	**BP-RY-SS-03-14**	CLPICPAES	IP	1	PASI-M
		EPA 9081	SMW	1	PASI-K
		EPA 6020	CJS	12	PASI-M
		EPA 7471	TEM	1	PASI-M
		% Moisture	JDL	1	PASI-M
		ASA 33-3.2/EPA 353.2	CAC	1	PASI-MT
		ASTM D421	CAC	1	PASI-MT
		ASA 29-3.5.2	CAC	1	PASI-MT
		ASA 10-3.2	CAC	1	PASI-MT
		ASA 24-5.4/SM4500	SA1	1	PASI-MT
		Modified Sobek 3.2	JH1	1	PASI-MT
		Modified Sobek 3.2	JH1	5	PASI-MT
		Modified Sobek 3.2	JH1	4	PASI-MT
		Modified Sobek 3.2	JH1	1	PASI-MT
		ASA 10-3.3	SR1	1	PASI-MT
10163246005	**BP-RY-SS-02-02**	CLPICPAES	IP	1	PASI-M
		EPA 9081	SMW	1	PASI-K
		EPA 6020	CJS	12	PASI-M
		EPA 7471	TEM	1	PASI-M
		% Moisture	JDL	1	PASI-M
		ASA 33-3.2/EPA 353.2	CAC	1	PASI-MT
		ASTM D421	CAC	1	PASI-MT
		ASA 29-3.5.2	CAC	1	PASI-MT
		ASA 10-3.2	CAC	1	PASI-MT
		ASA 24-5.4/SM4500	SA1	1	PASI-MT
		Modified Sobek 3.2	JH1	1	PASI-MT
		Modified Sobek 3.2	JH1	5	PASI-MT
		Modified Sobek 3.2	JH1	4	PASI-MT
		Modified Sobek 3.2	JH1	1	PASI-MT

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SAMPLE ANALYTE COUNT

Project: Black Pine Mine
Pace Project No.: 10163246

Lab ID	Sample ID	Method	Analysts	Analytes Reported	Laboratory
		ASA 10-3.3	SR1	1	PASI-MT
10163246006	**BP-RY-SS-04-00**	CLPICPAES	IP	1	PASI-M
		EPA 9081	SMW	1	PASI-K
		EPA 6020	CJS	12	PASI-M
		EPA 7471	TEM	1	PASI-M
		% Moisture	JDL	1	PASI-M
		ASA 33-3.2/EPA 353.2	CAC	1	PASI-MT
		ASTM D421	CAC	1	PASI-MT
		ASA 29-3.5.2	CAC	1	PASI-MT
		ASA 10-3.2	CAC	1	PASI-MT
		ASA 24-5.4/SM4500	SA1	1	PASI-MT
		Modified Sobek 3.2	JH1	1	PASI-MT
		Modified Sobek 3.2	JH1	5	PASI-MT
		Modified Sobek 3.2	JH1	4	PASI-MT
		Modified Sobek 3.2	JH1	1	PASI-MT
		ASA 10-3.3	SR1	1	PASI-MT
10163246007	**BP-RY-SS-04-02**	CLPICPAES	IP	1	PASI-M
		EPA 9081	SMW	1	PASI-K
		EPA 6020	CJS	12	PASI-M
		EPA 7471	TEM	1	PASI-M
		% Moisture	JDL	1	PASI-M
		ASA 33-3.2/EPA 353.2	CAC	1	PASI-MT
		ASTM D421	CAC	1	PASI-MT
		ASA 29-3.5.2	CAC	1	PASI-MT
		ASA 10-3.2	CAC	1	PASI-MT
		ASA 24-5.4/SM4500	SA1	1	PASI-MT
		Modified Sobek 3.2	JH1	1	PASI-MT
		Modified Sobek 3.2	JH1	5	PASI-MT
		Modified Sobek 3.2	JH1	4	PASI-MT
		Modified Sobek 3.2	JH1	1	PASI-MT
		ASA 10-3.3	SR1	1	PASI-MT
10163246008	**BP-RY-SS-04-10**	CLPICPAES	IP	1	PASI-M
		EPA 9081	SMW	1	PASI-K
		EPA 6020	CJS	12	PASI-M
		EPA 7471	TEM	1	PASI-M
		% Moisture	JDL	1	PASI-M
		ASA 33-3.2/EPA 353.2	CAC	1	PASI-MT

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SAMPLE ANALYTE COUNT

Project: Black Pine Mine
Pace Project No.: 10163246

Lab ID	Sample ID	Method	Analysts	Analytes Reported	Laboratory
		ASTM D421	CAC	1	PASI-MT
		ASA 29-3.5.2	CAC	1	PASI-MT
		ASA 10-3.2	CAC	1	PASI-MT
		ASA 24-5.4/SM4500	SA1	1	PASI-MT
		Modified Sobek 3.2	JH1	1	PASI-MT
		Modified Sobek 3.2	JH1	5	PASI-MT
		Modified Sobek 3.2	JH1	4	PASI-MT
		Modified Sobek 3.2	JH1	1	PASI-MT
		ASA 10-3.3	SR1	1	PASI-MT
10163246009	**BP-RY-SS-05-00**	CLPICPAES	IP	1	PASI-M
		EPA 9081	SMW	1	PASI-K
		EPA 6020	CJS	12	PASI-M
		EPA 7471	TEM	1	PASI-M
		% Moisture	JDL	1	PASI-M
		ASA 33-3.2/EPA 353.2	CAC	1	PASI-MT
		ASTM D421	CAC	1	PASI-MT
		ASA 29-3.5.2	CAC	1	PASI-MT
		ASA 10-3.2	CAC	1	PASI-MT
		ASA 24-5.4/SM4500	SA1	1	PASI-MT
		Modified Sobek 3.2	JH1	1	PASI-MT
		Modified Sobek 3.2	JH1	5	PASI-MT
		Modified Sobek 3.2	JH1	4	PASI-MT
		Modified Sobek 3.2	JH1	1	PASI-MT
		ASA 10-3.3	SR1	1	PASI-MT
10163246010	**BP-RY-SS-05-02**	CLPICPAES	IP	1	PASI-M
		EPA 9081	SMW	1	PASI-K
		EPA 6020	CJS	12	PASI-M
		EPA 7471	TEM	1	PASI-M
		% Moisture	JDL	1	PASI-M
		ASA 33-3.2/EPA 353.2	CAC	1	PASI-MT
		ASTM D421	CAC	1	PASI-MT
		ASA 29-3.5.2	CAC	1	PASI-MT
		ASA 10-3.2	CAC	1	PASI-MT
		ASA 24-5.4/SM4500	SA1	1	PASI-MT
		Modified Sobek 3.2	JH1	1	PASI-MT
		Modified Sobek 3.2	JH1	5	PASI-MT
		Modified Sobek 3.2	JH1	4	PASI-MT

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SAMPLE ANALYTE COUNT

Project: Black Pine Mine
Pace Project No.: 10163246

Lab ID	Sample ID	Method	Analysts	Analytes Reported	Laboratory
		Modified Sobek 3.2	JH1	1	PASI-MT
		ASA 10-3.3	SR1	1	PASI-MT

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PROJECT NARRATIVE

Project: Black Pine Mine
Pace Project No.: 10163246

Method: **CLPICPAES**
Description: 6010 MET ICP, MDEQ Potassium
Client: Montana Dept. of Environmental Quality
Date: August 10, 2011

General Information:
10 samples were analyzed for CLPICPAES. All samples were received in acceptable condition with any exceptions noted below.

Hold Time:
The samples were analyzed within the method required hold times with any exceptions noted below.

Sample Preparation:
The samples were prepared in accordance with ASA 13-3.5.2.2 with any exceptions noted below.

Initial Calibrations (including MS Tune as applicable):
All criteria were within method requirements with any exceptions noted below.

Continuing Calibration:
All criteria were within method requirements with any exceptions noted below.

Method Blank:
All analytes were below the report limit in the method blank with any exceptions noted below.

Laboratory Control Spike:
All laboratory control spike compounds were within QC limits with any exceptions noted below.

Matrix Spikes:
All percent recoveries and relative percent differences (RPDs) were within acceptance criteria with any exceptions noted below.

Duplicate Sample:
All duplicate sample results were within method acceptance criteria with any exceptions noted below.

Additional Comments:

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PROJECT NARRATIVE

Project: Black Pine Mine
Pace Project No.: 10163246

Method: **EPA 9081**
Description: Cation Exchange Capacity
Client: Montana Dept. of Environmental Quality
Date: August 10, 2011

General Information:
10 samples were analyzed for EPA 9081. All samples were received in acceptable condition with any exceptions noted below.

Hold Time:
The samples were analyzed within the method required hold times with any exceptions noted below.

Initial Calibrations (including MS Tune as applicable):
All criteria were within method requirements with any exceptions noted below.

Continuing Calibration:
All criteria were within method requirements with any exceptions noted below.

Method Blank:
All analytes were below the report limit in the method blank with any exceptions noted below.

Laboratory Control Spike:
All laboratory control spike compounds were within QC limits with any exceptions noted below.

Matrix Spikes:
All percent recoveries and relative percent differences (RPDs) were within acceptance criteria with any exceptions noted below.

Duplicate Sample:
All duplicate sample results were within method acceptance criteria with any exceptions noted below.

Additional Comments:

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PROJECT NARRATIVE

Project: Black Pine Mine
Pace Project No.: 10163246

Method: **EPA 6020**
Description: 6020 MET ICPMS
Client: Montana Dept. of Environmental Quality
Date: August 10, 2011

General Information:
10 samples were analyzed for EPA 6020. All samples were received in acceptable condition with any exceptions noted below.

Hold Time:
The samples were analyzed within the method required hold times with any exceptions noted below.

Sample Preparation:
The samples were prepared in accordance with EPA 3050 with any exceptions noted below.

Initial Calibrations (including MS Tune as applicable):
All criteria were within method requirements with any exceptions noted below.

Continuing Calibration:
All criteria were within method requirements with any exceptions noted below.

Internal Standards:
All internal standards were within QC limits with any exceptions noted below.

Method Blank:
All analytes were below the report limit in the method blank with any exceptions noted below.

QC Batch: MPRP/27163

P8: Analyte was detected in the method blank. All associated samples had concentrations of at least ten times greater than the blank or were below the reporting limit.

- BLANK (Lab ID: 1014833)
  - Lead

Laboratory Control Spike:
All laboratory control spike compounds were within QC limits with any exceptions noted below.

Matrix Spikes:
All percent recoveries and relative percent differences (RPDs) were within acceptance criteria with any exceptions noted below.

QC Batch: MPRP/27163

A matrix spike and matrix spike duplicate (MS/MSD) were performed on the following sample(s): 10163246001,10163606001

M6: Matrix spike and Matrix spike duplicate recovery not evaluated against control limits due to sample dilution.

- MS (Lab ID: 1014835)
  - Antimony
  - Barium
  - Iron
  - Manganese
  - Zinc
- MS (Lab ID: 1014837)
  - Arsenic

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PROJECT NARRATIVE

Project: Black Pine Mine
Pace Project No.: 10163246

Method: **EPA 6020**
Description: 6020 MET ICPMS
Client: Montana Dept. of Environmental Quality
Date: August 10, 2011

QC Batch: MPRP/27163

A matrix spike and matrix spike duplicate (MS/MSD) were performed on the following sample(s): 10163246001,10163606001

M6: Matrix spike and Matrix spike duplicate recovery not evaluated against control limits due to sample dilution.

- Barium
- Copper
- Iron
- Lead
- Manganese
- Zinc

- MSD (Lab ID: 1014836)
  - Antimony
  - Arsenic
  - Barium
  - Iron
  - Manganese
  - Zinc

Duplicate Sample:
All duplicate sample results were within method acceptance criteria with any exceptions noted below.

Additional Comments:

Analyte Comments:

QC Batch: MPRP/27163

E: Analyte concentration exceeded the calibration range. The reported result is estimated.

- MS (Lab ID: 1014835)
  - Manganese
- MSD (Lab ID: 1014836)
  - Manganese

P8: Analyte was detected in the method blank. All associated samples had concentrations of at least ten times greater than the blank or were below the reporting limit.

- BLANK (Lab ID: 1014833)
  - Lead

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PROJECT NARRATIVE

Project: Black Pine Mine
Pace Project No.: 10163246

Method: **EPA 7471**
Description: 7471 Mercury
Client: Montana Dept. of Environmental Quality
Date: August 10, 2011

General Information:
10 samples were analyzed for EPA 7471. All samples were received in acceptable condition with any exceptions noted below.

Hold Time:
The samples were analyzed within the method required hold times with any exceptions noted below.

Sample Preparation:
The samples were prepared in accordance with EPA 7471 with any exceptions noted below.

Initial Calibrations (including MS Tune as applicable):
All criteria were within method requirements with any exceptions noted below.

Continuing Calibration:
All criteria were within method requirements with any exceptions noted below.

Method Blank:
All analytes were below the report limit in the method blank with any exceptions noted below.

Laboratory Control Spike:
All laboratory control spike compounds were within QC limits with any exceptions noted below.

Matrix Spikes:
All percent recoveries and relative percent differences (RPDs) were within acceptance criteria with any exceptions noted below.

QC Batch: MERP/5632

A matrix spike and matrix spike duplicate (MS/MSD) were performed on the following sample(s): 10163246001,10163483010

M1: Matrix spike recovery exceeded QC limits. Batch accepted based on laboratory control sample (LCS) recovery.

- MS (Lab ID: 1014984)
  - Mercury
- MSD (Lab ID: 1014985)
  - Mercury

M6: Matrix spike and Matrix spike duplicate recovery not evaluated against control limits due to sample dilution.

- MS (Lab ID: 1014986)
  - Mercury

Duplicate Sample:
All duplicate sample results were within method acceptance criteria with any exceptions noted below.

Additional Comments:

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PROJECT NARRATIVE

Project: Black Pine Mine
Pace Project No.: 10163246

Method: **ASA 33-3.2/EPA 353.2**
Description: 353.2 Nitrate + Nitrite pres.
Client: Montana Dept. of Environmental Quality
Date: August 10, 2011

General Information:
10 samples were analyzed for ASA 33-3.2/EPA 353.2. All samples were received in acceptable condition with any exceptions noted below.

Hold Time:
The samples were analyzed within the method required hold times with any exceptions noted below.

Initial Calibrations (including MS Tune as applicable):
All criteria were within method requirements with any exceptions noted below.

Continuing Calibration:
All criteria were within method requirements with any exceptions noted below.

Internal Standards:
All internal standards were within QC limits with any exceptions noted below.

Surrogates:
All surrogates were within QC limits with any exceptions noted below.

Method Blank:
All analytes were below the report limit in the method blank with any exceptions noted below.

Laboratory Control Spike:
All laboratory control spike compounds were within QC limits with any exceptions noted below.

Matrix Spikes:
All percent recoveries and relative percent differences (RPDs) were within acceptance criteria with any exceptions noted below.

Duplicate Sample:
All duplicate sample results were within method acceptance criteria with any exceptions noted below.

Additional Comments:

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PROJECT NARRATIVE

Project: Black Pine Mine
Pace Project No.: 10163246

Method: **ASTM D421**
Description: Coarse
Client: Montana Dept. of Environmental Quality
Date: August 10, 2011

General Information:
10 samples were analyzed for ASTM D421. All samples were received in acceptable condition with any exceptions noted below.

Hold Time:
The samples were analyzed within the method required hold times with any exceptions noted below.

Initial Calibrations (including MS Tune as applicable):
All criteria were within method requirements with any exceptions noted below.

Continuing Calibration:
All criteria were within method requirements with any exceptions noted below.

Internal Standards:
All internal standards were within QC limits with any exceptions noted below.

Surrogates:
All surrogates were within QC limits with any exceptions noted below.

Method Blank:
All analytes were below the report limit in the method blank with any exceptions noted below.

Laboratory Control Spike:
All laboratory control spike compounds were within QC limits with any exceptions noted below.

Matrix Spikes:
All percent recoveries and relative percent differences (RPDs) were within acceptance criteria with any exceptions noted below.

Duplicate Sample:
All duplicate sample results were within method acceptance criteria with any exceptions noted below.

Additional Comments:

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PROJECT NARRATIVE

Project: Black Pine Mine
Pace Project No.: 10163246

Method: **ASA 29-3.5.2**
Description: Organic Matter MT ASA 29
Client: Montana Dept. of Environmental Quality
Date: August 10, 2011

General Information:
10 samples were analyzed for ASA 29-3.5.2. All samples were received in acceptable condition with any exceptions noted below.

Hold Time:
The samples were analyzed within the method required hold times with any exceptions noted below.

Initial Calibrations (including MS Tune as applicable):
All criteria were within method requirements with any exceptions noted below.

Continuing Calibration:
All criteria were within method requirements with any exceptions noted below.

Internal Standards:
All internal standards were within QC limits with any exceptions noted below.

Surrogates:
All surrogates were within QC limits with any exceptions noted below.

Method Blank:
All analytes were below the report limit in the method blank with any exceptions noted below.

Laboratory Control Spike:
All laboratory control spike compounds were within QC limits with any exceptions noted below.

Matrix Spikes:
All percent recoveries and relative percent differences (RPDs) were within acceptance criteria with any exceptions noted below.

Duplicate Sample:
All duplicate sample results were within method acceptance criteria with any exceptions noted below.

Additional Comments:

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PROJECT NARRATIVE

Project: Black Pine Mine
Pace Project No.: 10163246

Method: **ASA 10-3.2**
Description: ASA 10-3.2 pH
Client: Montana Dept. of Environmental Quality
Date: August 10, 2011

General Information:
10 samples were analyzed for ASA 10-3.2. All samples were received in acceptable condition with any exceptions noted below.

Hold Time:
The samples were analyzed within the method required hold times with any exceptions noted below.

Initial Calibrations (including MS Tune as applicable):
All criteria were within method requirements with any exceptions noted below.

Continuing Calibration:
All criteria were within method requirements with any exceptions noted below.

Internal Standards:
All internal standards were within QC limits with any exceptions noted below.

Surrogates:
All surrogates were within QC limits with any exceptions noted below.

Method Blank:
All analytes were below the report limit in the method blank with any exceptions noted below.

Laboratory Control Spike:
All laboratory control spike compounds were within QC limits with any exceptions noted below.

Matrix Spikes:
All percent recoveries and relative percent differences (RPDs) were within acceptance criteria with any exceptions noted below.

Duplicate Sample:
All duplicate sample results were within method acceptance criteria with any exceptions noted below.

Additional Comments:

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PROJECT NARRATIVE

Project: Black Pine Mine
Pace Project No.: 10163246

Method: **ASA 24-5.4/SM4500**
Description: SM4500P-E, Total Phosphorus
Client: Montana Dept. of Environmental Quality
Date: August 10, 2011

General Information:
10 samples were analyzed for ASA 24-5.4/SM4500. All samples were received in acceptable condition with any exceptions noted below.

Hold Time:
The samples were analyzed within the method required hold times with any exceptions noted below.

Initial Calibrations (including MS Tune as applicable):
All criteria were within method requirements with any exceptions noted below.

Continuing Calibration:
All criteria were within method requirements with any exceptions noted below.

Internal Standards:
All internal standards were within QC limits with any exceptions noted below.

Surrogates:
All surrogates were within QC limits with any exceptions noted below.

Method Blank:
All analytes were below the report limit in the method blank with any exceptions noted below.

Laboratory Control Spike:
All laboratory control spike compounds were within QC limits with any exceptions noted below.

Matrix Spikes:
All percent recoveries and relative percent differences (RPDs) were within acceptance criteria with any exceptions noted below.

Duplicate Sample:
All duplicate sample results were within method acceptance criteria with any exceptions noted below.

Additional Comments:

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(406)254-7226

PROJECT NARRATIVE

Project: Black Pine Mine
Pace Project No.: 10163246

Method: **Modified Sobek 3.2**
Description: Sobek Acid Base Potential
Client: Montana Dept. of Environmental Quality
Date: August 10, 2011

General Information:
10 samples were analyzed for Modified Sobek 3.2. All samples were received in acceptable condition with any exceptions noted below.

Hold Time:
The samples were analyzed within the method required hold times with any exceptions noted below.

Initial Calibrations (including MS Tune as applicable):
All criteria were within method requirements with any exceptions noted below.

Continuing Calibration:
All criteria were within method requirements with any exceptions noted below.

Internal Standards:
All internal standards were within QC limits with any exceptions noted below.

Surrogates:
All surrogates were within QC limits with any exceptions noted below.

Method Blank:
All analytes were below the report limit in the method blank with any exceptions noted below.

Laboratory Control Spike:
All laboratory control spike compounds were within QC limits with any exceptions noted below.

Matrix Spikes:
All percent recoveries and relative percent differences (RPDs) were within acceptance criteria with any exceptions noted below.

Duplicate Sample:
All duplicate sample results were within method acceptance criteria with any exceptions noted below.

Additional Comments:

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PROJECT NARRATIVE

Project: Black Pine Mine
Pace Project No.: 10163246

Method: **Modified Sobek 3.2**
Description: Sobek Extractable Sulfur
Client: Montana Dept. of Environmental Quality
Date: August 10, 2011

General Information:
10 samples were analyzed for Modified Sobek 3.2. All samples were received in acceptable condition with any exceptions noted below.

Hold Time:
The samples were analyzed within the method required hold times with any exceptions noted below.

Initial Calibrations (including MS Tune as applicable):
All criteria were within method requirements with any exceptions noted below.

Continuing Calibration:
All criteria were within method requirements with any exceptions noted below.

Internal Standards:
All internal standards were within QC limits with any exceptions noted below.

Surrogates:
All surrogates were within QC limits with any exceptions noted below.

Method Blank:
All analytes were below the report limit in the method blank with any exceptions noted below.

Laboratory Control Spike:
All laboratory control spike compounds were within QC limits with any exceptions noted below.

Matrix Spikes:
All percent recoveries and relative percent differences (RPDs) were within acceptance criteria with any exceptions noted below.

Duplicate Sample:
All duplicate sample results were within method acceptance criteria with any exceptions noted below.

Additional Comments:

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PROJECT NARRATIVE

Project: Black Pine Mine
Pace Project No.: 10163246

Method: **Modified Sobek 3.2**
Description: Sobek Calculations
Client: Montana Dept. of Environmental Quality
Date: August 10, 2011

General Information:
10 samples were analyzed for Modified Sobek 3.2. All samples were received in acceptable condition with any exceptions noted below.

Hold Time:
The samples were analyzed within the method required hold times with any exceptions noted below.

Initial Calibrations (including MS Tune as applicable):
All criteria were within method requirements with any exceptions noted below.

Continuing Calibration:
All criteria were within method requirements with any exceptions noted below.

Internal Standards:
All internal standards were within QC limits with any exceptions noted below.

Surrogates:
All surrogates were within QC limits with any exceptions noted below.

Method Blank:
All analytes were below the report limit in the method blank with any exceptions noted below.

Laboratory Control Spike:
All laboratory control spike compounds were within QC limits with any exceptions noted below.

Matrix Spikes:
All percent recoveries and relative percent differences (RPDs) were within acceptance criteria with any exceptions noted below.

Duplicate Sample:
All duplicate sample results were within method acceptance criteria with any exceptions noted below.

Additional Comments:

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PROJECT NARRATIVE

Project: Black Pine Mine
Pace Project No.: 10163246

Method: **Modified Sobek 3.2**
Description: Sobek SMP Buffer pH
Client: Montana Dept. of Environmental Quality
Date: August 10, 2011

General Information:
10 samples were analyzed for Modified Sobek 3.2. All samples were received in acceptable condition with any exceptions noted below.

Hold Time:
The samples were analyzed within the method required hold times with any exceptions noted below.

Initial Calibrations (including MS Tune as applicable):
All criteria were within method requirements with any exceptions noted below.

Continuing Calibration:
All criteria were within method requirements with any exceptions noted below.

Internal Standards:
All internal standards were within QC limits with any exceptions noted below.

Surrogates:
All surrogates were within QC limits with any exceptions noted below.

Method Blank:
All analytes were below the report limit in the method blank with any exceptions noted below.

Laboratory Control Spike:
All laboratory control spike compounds were within QC limits with any exceptions noted below.

Matrix Spikes:
All percent recoveries and relative percent differences (RPDs) were within acceptance criteria with any exceptions noted below.

Duplicate Sample:
All duplicate sample results were within method acceptance criteria with any exceptions noted below.

Additional Comments:

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PROJECT NARRATIVE

Project: Black Pine Mine
Pace Project No.: 10163246

Method: **ASA 10-3.3**
Description: ASA10-3.3 Specific Conductance
Client: Montana Dept. of Environmental Quality
Date: August 10, 2011

General Information:
10 samples were analyzed for ASA 10-3.3. All samples were received in acceptable condition with any exceptions noted below.

Hold Time:
The samples were analyzed within the method required hold times with any exceptions noted below.

Initial Calibrations (including MS Tune as applicable):
All criteria were within method requirements with any exceptions noted below.

Continuing Calibration:
All criteria were within method requirements with any exceptions noted below.

Internal Standards:
All internal standards were within QC limits with any exceptions noted below.

Surrogates:
All surrogates were within QC limits with any exceptions noted below.

Method Blank:
All analytes were below the report limit in the method blank with any exceptions noted below.

Laboratory Control Spike:
All laboratory control spike compounds were within QC limits with any exceptions noted below.

Matrix Spikes:
All percent recoveries and relative percent differences (RPDs) were within acceptance criteria with any exceptions noted below.

Duplicate Sample:
All duplicate sample results were within method acceptance criteria with any exceptions noted below.

QC Batch: MT/6547

D6: The relative percent difference (RPD) between the sample and sample duplicate exceeded laboratory control limits.

- DUP (Lab ID: 1022943)
  - Sp.Conductance Saturated Paste

Additional Comments:

This data package has been reviewed for quality and completeness and is approved for release.

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ANALYTICAL RESULTS

Project: Black Pine Mine
Pace Project No.: 10163246

Sample: BP-RY-SS-02-00 **Lab ID: 10163246001** Collected: 07/12/11 08:50 Received: 07/13/11 09:00 Matrix: Solid

Results reported on a "dry-weight" basis

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
6010 MET ICP, MDEQ Potassium	Analytical Method: CLPICPAES Preparation Method: ASA 13-3.5.2.2							
Potassium	**<568**	mg/kg	568	5	08/01/11 17:34	08/01/11 17:56	7440-09-7	
Cation Exchange Capacity	Analytical Method: EPA 9081							
Cation Exchange Capacity	**49.8**	meq/100g	1.0	10	07/27/11 15:00	07/29/11 12:37		
6020 MET ICPMS	Analytical Method: EPA 6020 Preparation Method: EPA 3050							
Antimony	**0.60**	mg/kg	0.45	20	07/25/11 09:38	07/31/11 15:18	7440-36-0	M6
Arsenic	**7.2**	mg/kg	0.45	20	07/25/11 09:38	07/31/11 15:18	7440-38-2	M6
Barium	**248**	mg/kg	0.27	20	07/25/11 09:38	07/31/11 15:18	7440-39-3	M6
Cadmium	**0.31**	mg/kg	0.073	20	07/25/11 09:38	07/31/11 15:18	7440-43-9	
Chromium	**4.4**	mg/kg	0.45	20	07/25/11 09:38	07/31/11 15:18	7440-47-3	
Copper	**5.7**	mg/kg	0.45	20	07/25/11 09:38	07/31/11 15:18	7440-50-8	
Iron	**6090**	mg/kg	45.4	20	07/25/11 09:38	07/31/11 15:18	7439-89-6	M6
Lead	**5.4**	mg/kg	0.091	20	07/25/11 09:38	07/31/11 15:18	7439-92-1	
Manganese	**782**	mg/kg	2.3	100	07/25/11 09:38	07/31/11 15:21	7439-96-5	M6
Nickel	**8.5**	mg/kg	0.45	20	07/25/11 09:38	07/31/11 15:18	7440-02-0	
Silver	**<0.45**	mg/kg	0.45	20	07/25/11 09:38	07/31/11 15:18	7440-22-4	
Zinc	**42.7**	mg/kg	4.5	20	07/25/11 09:38	07/31/11 15:18	7440-66-6	M6
7471 Mercury	Analytical Method: EPA 7471 Preparation Method: EPA 7471							
Mercury	**0.14**	mg/kg	0.018	1	07/28/11 19:33	07/31/11 12:18	7439-97-6	M1
Dry Weight	Analytical Method: % Moisture							
Percent Moisture	**6.6**	%	0.10	1		07/20/11 00:00		
353.2 Nitrate + Nitrite pres.	Analytical Method: ASA 33-3.2/EPA 353.2							
Available Nitrate	**<5.0**	mg/kg	5.0	1		07/26/11 17:40		
Coarse	Analytical Method: ASTM D421							
Coarse Fragment	**50.4**	% (w/w)	0.10	1		07/26/11 12:15		
Organic Matter MT ASA 29	Analytical Method: ASA 29-3.5.2							
Organic Matter	**8.7**	% (w/w)	0.10	1		07/21/11 16:50		
ASA 10-3.2 pH	Analytical Method: ASA 10-3.2							
pH, Saturated Paste	**7.8**	Std. Units	0.10	1		07/27/11 17:26		
SM4500P-E, Total Phosphorus	Analytical Method: ASA 24-5.4/SM4500							
Available Phosphorus	**22.0**	mg/kg	2.0	2		07/25/11 14:31	7723-14-0	
Sobek Acid Base Potential	Analytical Method: Modified Sobek 3.2							
Neutralization Potential	**125**	tons/1000	0.50	1		07/29/11 00:00		

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ANALYTICAL RESULTS

Project: Black Pine Mine
Pace Project No.: 10163246

Sample: BP-RY-SS-02-00 **Lab ID: 10163246001** Collected: 07/12/11 08:50 Received: 07/13/11 09:00 Matrix: Solid

Results reported on a "dry-weight" basis

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
Sobek Extractable Sulfur	Analytical Method: Modified Sobek 3.2							
Sulfur, HCl Extractable	**<0.050**	% (w/w)	0.050	1		07/26/11 15:00		
Sulfur, HNO3 Extractable	**<0.050**	% (w/w)	0.050	1		07/26/11 15:00		
Sulfur, Hot Water Extractable	**<0.050**	% (w/w)	0.050	1		07/26/11 15:00		
Sulfur, Residual	**<0.050**	% (w/w)	0.050	1		07/26/11 15:00		
Total Sulfur	**<0.050**	% (w/w)	0.050	1		07/26/11 15:00		
Sobek Calculations	Analytical Method: Modified Sobek 3.2							
Acid/Base Potential	**124**	tons/1000		1		07/26/11 15:00		
Acid Potential	**<4.3**	tons/1000	4.3	1		07/26/11 15:00		
Lime Requirement	**<5.4**	tons/1000	5.4	1		07/26/11 15:00		
SMP Lime Requirement	**0**	tons/1000	0.0	1		07/26/11 15:00		
Sobek SMP Buffer pH	Analytical Method: Modified Sobek 3.2							
SMP Buffer pH	**7.0**	Std. Units	0.10	1		07/26/11 15:00		
ASA10-3.3 Specific Conductance	Analytical Method: ASA 10-3.3							
Sp.Conductance Saturated Paste	**0.33**	mmhos/cm	0.010	1		07/27/11 12:56		

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ANALYTICAL RESULTS

Project: Black Pine Mine
Pace Project No.: 10163246

Sample: BP-RY-SS-01-00 **Lab ID: 10163246002** Collected: 07/12/11 09:18 Received: 07/13/11 09:00 Matrix: Solid

Results reported on a "dry-weight" basis

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
6010 MET ICP, MDEQ Potassium	Analytical Method: CLPICPAES Preparation Method: ASA 13-3.5.2.2							
Potassium	**<277**	mg/kg	277	5	08/01/11 17:34	08/01/11 18:01	7440-09-7	
Cation Exchange Capacity	Analytical Method: EPA 9081							
Cation Exchange Capacity	**32.3**	meq/100g	0.99	10	07/27/11 15:00	07/29/11 12:44		
6020 MET ICPMS	Analytical Method: EPA 6020 Preparation Method: EPA 3050							
Antimony	**0.48**	mg/kg	0.37	20	07/25/11 09:38	07/31/11 15:25	7440-36-0	
Arsenic	**4.0**	mg/kg	0.37	20	07/25/11 09:38	07/31/11 15:25	7440-38-2	
Barium	**284**	mg/kg	0.22	20	07/25/11 09:38	07/31/11 15:25	7440-39-3	
Cadmium	**0.093**	mg/kg	0.060	20	07/25/11 09:38	07/31/11 15:25	7440-43-9	
Chromium	**6.8**	mg/kg	0.37	20	07/25/11 09:38	07/31/11 15:25	7440-47-3	
Copper	**5.1**	mg/kg	0.37	20	07/25/11 09:38	07/31/11 15:25	7440-50-8	
Iron	**11800**	mg/kg	37.4	20	07/25/11 09:38	07/31/11 15:25	7439-89-6	
Lead	**6.8**	mg/kg	0.075	20	07/25/11 09:38	07/31/11 15:25	7439-92-1	
Manganese	**327**	mg/kg	1.9	100	07/25/11 09:38	07/31/11 15:28	7439-96-5	
Nickel	**13.6**	mg/kg	0.37	20	07/25/11 09:38	07/31/11 15:25	7440-02-0	
Silver	**<0.37**	mg/kg	0.37	20	07/25/11 09:38	07/31/11 15:25	7440-22-4	
Zinc	**36.8**	mg/kg	3.7	20	07/25/11 09:38	07/31/11 15:25	7440-66-6	
7471 Mercury	Analytical Method: EPA 7471 Preparation Method: EPA 7471							
Mercury	**0.025**	mg/kg	0.019	1	07/28/11 19:33	07/31/11 12:24	7439-97-6	
Dry Weight	Analytical Method: % Moisture							
Percent Moisture	**8.4**	%	0.10	1		07/21/11 00:00		
353.2 Nitrate + Nitrite pres.	Analytical Method: ASA 33-3.2/EPA 353.2							
Available Nitrate	**<5.0**	mg/kg	5.0	1		07/26/11 17:42		
Coarse	Analytical Method: ASTM D421							
Coarse Fragment	**67.1**	% (w/w)	0.10	1		07/26/11 12:15		
Organic Matter MT ASA 29	Analytical Method: ASA 29-3.5.2							
Organic Matter	**3.3**	% (w/w)	0.10	1		07/21/11 16:50		
ASA 10-3.2 pH	Analytical Method: ASA 10-3.2							
pH, Saturated Paste	**7.1**	Std. Units	0.10	1		07/27/11 17:26		
SM4500P-E, Total Phosphorus	Analytical Method: ASA 24-5.4/SM4500							
Available Phosphorus	**18.1**	mg/kg	2.0	2		07/25/11 14:33	7723-14-0	
Sobek Acid Base Potential	Analytical Method: Modified Sobek 3.2							
Neutralization Potential	**8.2**	tons/1000	0.50	1		07/29/11 00:00		

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ANALYTICAL RESULTS

Project: Black Pine Mine
Pace Project No.: 10163246

Sample: BP-RY-SS-01-00 **Lab ID: 10163246002** Collected: 07/12/11 09:18 Received: 07/13/11 09:00 Matrix: Solid

Results reported on a "dry-weight" basis

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
Sobek Extractable Sulfur	Analytical Method: Modified Sobek 3.2							
Sulfur, HCl Extractable	**<0.050**	% (w/w)	0.050	1		07/26/11 15:00		
Sulfur, HNO3 Extractable	**<0.050**	% (w/w)	0.050	1		07/26/11 15:00		
Sulfur, Hot Water Extractable	**<0.050**	% (w/w)	0.050	1		07/26/11 15:00		
Sulfur, Residual	**<0.050**	% (w/w)	0.050	1		07/26/11 15:00		
Total Sulfur	**<0.050**	% (w/w)	0.050	1		07/26/11 15:00		
Sobek Calculations	Analytical Method: Modified Sobek 3.2							
Acid/Base Potential	**8.2**	tons/1000		1		07/26/11 15:00		
Acid Potential	**<4.3**	tons/1000	4.3	1		07/26/11 15:00		
Lime Requirement	**6.3**	tons/1000	5.4	1		07/26/11 15:00		
SMP Lime Requirement	**4.6**	tons/1000	0.0	1		07/26/11 15:00		
Sobek SMP Buffer pH	Analytical Method: Modified Sobek 3.2							
SMP Buffer pH	**6.3**	Std. Units	0.10	1		07/26/11 15:00		
ASA10-3.3 Specific Conductance	Analytical Method: ASA 10-3.3							
Sp.Conductance Saturated Paste	**0.17**	mmhos/cm	0.010	1		07/27/11 12:56		

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ANALYTICAL RESULTS

Project: Black Pine Mine
Pace Project No.: 10163246

Sample: BP-RY-SS-03-00 **Lab ID: 10163246003** Collected: 07/12/11 10:25 Received: 07/13/11 09:00 Matrix: Solid

Results reported on a "dry-weight" basis

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
6010 MET ICP, MDEQ Potassium	Analytical Method: CLPICPAES Preparation Method: ASA 13-3.5.2.2							
Potassium	**<174**	mg/kg	174	5	08/01/11 17:34	08/01/11 18:05	7440-09-7	
Cation Exchange Capacity	Analytical Method: EPA 9081							
Cation Exchange Capacity	**14.1**	meq/100g	0.99	10	07/27/11 15:00	07/29/11 12:47		
6020 MET ICPMS	Analytical Method: EPA 6020 Preparation Method: EPA 3050							
Antimony	**2.4**	mg/kg	0.55	20	07/25/11 09:38	07/31/11 15:32	7440-36-0	
Arsenic	**8.4**	mg/kg	0.55	20	07/25/11 09:38	07/31/11 15:32	7440-38-2	
Barium	**202**	mg/kg	0.33	20	07/25/11 09:38	07/31/11 15:32	7440-39-3	
Cadmium	**0.14**	mg/kg	0.089	20	07/25/11 09:38	07/31/11 15:32	7440-43-9	
Chromium	**10.1**	mg/kg	0.55	20	07/25/11 09:38	07/31/11 15:32	7440-47-3	
Copper	**12.9**	mg/kg	0.55	20	07/25/11 09:38	07/31/11 15:32	7440-50-8	
Iron	**17900**	mg/kg	55.3	20	07/25/11 09:38	07/31/11 15:32	7439-89-6	
Lead	**20.4**	mg/kg	0.11	20	07/25/11 09:38	07/31/11 15:32	7439-92-1	
Manganese	**399**	mg/kg	0.55	20	07/25/11 09:38	07/31/11 15:32	7439-96-5	
Nickel	**12.0**	mg/kg	0.55	20	07/25/11 09:38	07/31/11 15:32	7440-02-0	
Silver	**<0.55**	mg/kg	0.55	20	07/25/11 09:38	07/31/11 15:32	7440-22-4	
Zinc	**37.2**	mg/kg	5.5	20	07/25/11 09:38	07/31/11 15:32	7440-66-6	
7471 Mercury	Analytical Method: EPA 7471 Preparation Method: EPA 7471							
Mercury	**0.062**	mg/kg	0.018	1	07/28/11 19:33	07/31/11 12:26	7439-97-6	
Dry Weight	Analytical Method: % Moisture							
Percent Moisture	**10.5**	%	0.10	1		07/21/11 00:00		
353.2 Nitrate + Nitrite pres.	Analytical Method: ASA 33-3.2/EPA 353.2							
Available Nitrate	**<5.0**	mg/kg	5.0	1		07/26/11 17:43		
Coarse	Analytical Method: ASTM D421							
Coarse Fragment	**83.9**	% (w/w)	0.10	1		07/26/11 12:15		
Organic Matter MT ASA 29	Analytical Method: ASA 29-3.5.2							
Organic Matter	**0.35**	% (w/w)	0.10	1		07/21/11 16:50		
ASA 10-3.2 pH	Analytical Method: ASA 10-3.2							
pH, Saturated Paste	**7.0**	Std. Units	0.10	1		07/27/11 17:26		
SM4500P-E, Total Phosphorus	Analytical Method: ASA 24-5.4/SM4500							
Available Phosphorus	**7.1**	mg/kg	1.0	1		07/25/11 14:33	7723-14-0	
Sobek Acid Base Potential	Analytical Method: Modified Sobek 3.2							
Neutralization Potential	**6.5**	tons/1000	0.50	1		07/29/11 00:00		

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ANALYTICAL RESULTS

Project: Black Pine Mine
Pace Project No.: 10163246

Sample: BP-RY-SS-03-00 **Lab ID: 10163246003** Collected: 07/12/11 10:25 Received: 07/13/11 09:00 Matrix: Solid

Results reported on a "dry-weight" basis

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
Sobek Extractable Sulfur	Analytical Method: Modified Sobek 3.2							
Sulfur, HCl Extractable	**<0.050**	% (w/w)	0.050	1		07/26/11 15:00		
Sulfur, HNO3 Extractable	**<0.050**	% (w/w)	0.050	1		07/26/11 15:00		
Sulfur, Hot Water Extractable	**<0.050**	% (w/w)	0.050	1		07/26/11 15:00		
Sulfur, Residual	**<0.050**	% (w/w)	0.050	1		07/26/11 15:00		
Total Sulfur	**<0.050**	% (w/w)	0.050	1		07/26/11 15:00		
Sobek Calculations	Analytical Method: Modified Sobek 3.2							
Acid/Base Potential	**6.5**	tons/1000		1		07/26/11 15:00		
Acid Potential	**<4.3**	tons/1000	4.3	1		07/26/11 15:00		
Lime Requirement	**<5.4**	tons/1000	5.4	1		07/26/11 15:00		
SMP Lime Requirement	**0.3**	tons/1000	0.0	1		07/26/11 15:00		
Sobek SMP Buffer pH	Analytical Method: Modified Sobek 3.2							
SMP Buffer pH	**6.8**	Std. Units	0.10	1		07/26/11 15:00		
ASA10-3.3 Specific Conductance	Analytical Method: ASA 10-3.3							
Sp.Conductance Saturated Paste	**0.067**	mmhos/cm	0.010	1		07/27/11 12:56		

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ANALYTICAL RESULTS

Project: Black Pine Mine
Pace Project No.: 10163246

Sample: BP-RY-SS-03-14 **Lab ID: 10163246004** Collected: 07/12/11 10:28 Received: 07/13/11 09:00 Matrix: Solid

Results reported on a "dry-weight" basis

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
6010 MET ICP, MDEQ Potassium	Analytical Method: CLPICPAES Preparation Method: ASA 13-3.5.2.2							
Potassium	**158**	mg/kg	132	5	08/01/11 17:34	08/01/11 18:10	7440-09-7	
Cation Exchange Capacity	Analytical Method: EPA 9081							
Cation Exchange Capacity	**11.7**	meq/100g	1.0	10	07/27/11 15:00	07/29/11 12:50		
6020 MET ICPMS	Analytical Method: EPA 6020 Preparation Method: EPA 3050							
Antimony	**1.8**	mg/kg	0.38	20	07/25/11 09:38	07/31/11 16:04	7440-36-0	
Arsenic	**11.3**	mg/kg	0.38	20	07/25/11 09:38	07/31/11 16:04	7440-38-2	
Barium	**132**	mg/kg	0.23	20	07/25/11 09:38	07/31/11 16:04	7440-39-3	
Cadmium	**0.089**	mg/kg	0.061	20	07/25/11 09:38	07/31/11 16:04	7440-43-9	
Chromium	**5.1**	mg/kg	0.38	20	07/25/11 09:38	07/31/11 16:04	7440-47-3	
Copper	**7.6**	mg/kg	0.38	20	07/25/11 09:38	07/31/11 16:04	7440-50-8	
Iron	**13000**	mg/kg	38.2	20	07/25/11 09:38	07/31/11 16:04	7439-89-6	
Lead	**12.9**	mg/kg	0.076	20	07/25/11 09:38	07/31/11 16:04	7439-92-1	
Manganese	**153**	mg/kg	0.38	20	07/25/11 09:38	07/31/11 16:04	7439-96-5	
Nickel	**6.7**	mg/kg	0.38	20	07/25/11 09:38	07/31/11 16:04	7440-02-0	
Silver	**<0.38**	mg/kg	0.38	20	07/25/11 09:38	07/31/11 16:04	7440-22-4	
Zinc	**15.9**	mg/kg	3.8	20	07/25/11 09:38	07/31/11 16:04	7440-66-6	
7471 Mercury	Analytical Method: EPA 7471 Preparation Method: EPA 7471							
Mercury	**0.069**	mg/kg	0.018	1	07/28/11 19:33	07/31/11 12:28	7439-97-6	
Dry Weight	Analytical Method: % Moisture							
Percent Moisture	**11.6**	%	0.10	1		07/21/11 00:00		
353.2 Nitrate + Nitrite pres.	Analytical Method: ASA 33-3.2/EPA 353.2							
Available Nitrate	**<5.0**	mg/kg	5.0	1		07/26/11 17:45		
Coarse	Analytical Method: ASTM D421							
Coarse Fragment	**22.3**	% (w/w)	0.10	1		07/26/11 12:15		
Organic Matter MT ASA 29	Analytical Method: ASA 29-3.5.2							
Organic Matter	**<0.10**	% (w/w)	0.10	1		07/21/11 16:50		
ASA 10-3.2 pH	Analytical Method: ASA 10-3.2							
pH, Saturated Paste	**7.0**	Std. Units	0.10	1		07/27/11 17:28		
SM4500P-E, Total Phosphorus	Analytical Method: ASA 24-5.4/SM4500							
Available Phosphorus	**2.8**	mg/kg	1.0	1		07/25/11 14:36	7723-14-0	
Sobek Acid Base Potential	Analytical Method: Modified Sobek 3.2							
Neutralization Potential	**3.7**	tons/1000	0.50	1		07/29/11 00:00		

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ANALYTICAL RESULTS

Project: Black Pine Mine
Pace Project No.: 10163246

Sample: BP-RY-SS-03-14 **Lab ID: 10163246004** Collected: 07/12/11 10:28 Received: 07/13/11 09:00 Matrix: Solid

Results reported on a "dry-weight" basis

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
Sobek Extractable Sulfur	Analytical Method: Modified Sobek 3.2							
Sulfur, HCl Extractable	**<0.050**	% (w/w)	0.050	1		07/26/11 15:00		
Sulfur, HNO3 Extractable	**<0.050**	% (w/w)	0.050	1		07/26/11 15:00		
Sulfur, Hot Water Extractable	**<0.050**	% (w/w)	0.050	1		07/26/11 15:00		
Sulfur, Residual	**<0.050**	% (w/w)	0.050	1		07/26/11 15:00		
Total Sulfur	**<0.050**	% (w/w)	0.050	1		07/26/11 15:00		
Sobek Calculations	Analytical Method: Modified Sobek 3.2							
Acid/Base Potential	**3.7**	tons/1000		1		07/26/11 15:00		
Acid Potential	**<3.7**	tons/1000	4.3	1		07/26/11 15:00		
Lime Requirement	**<5.4**	tons/1000	5.4	1		07/26/11 15:00		
SMP Lime Requirement	**0**	tons/1000	0.0	1		07/26/11 15:00		
Sobek SMP Buffer pH	Analytical Method: Modified Sobek 3.2							
SMP Buffer pH	**7.0**	Std. Units	0.10	1		07/26/11 15:00		
ASA10-3.3 Specific Conductance	Analytical Method: ASA 10-3.3							
Sp.Conductance Saturated Paste	**0.091**	mmhos/cm	0.010	1		07/27/11 12:56		

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ANALYTICAL RESULTS

Project: Black Pine Mine
Pace Project No.: 10163246

Sample: BP-RY-SS-02-02 **Lab ID: 10163246005** Collected: 07/12/11 08:55 Received: 07/13/11 09:00 Matrix: Solid

Results reported on a "dry-weight" basis

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
6010 MET ICP, MDEQ Potassium	Analytical Method: CLPICPAES Preparation Method: ASA 13-3.5.2.2							
Potassium	**<124**	mg/kg	124	5	08/01/11 17:34	08/01/11 18:14	7440-09-7	
Cation Exchange Capacity	Analytical Method: EPA 9081							
Cation Exchange Capacity	**35.5**	meq/100g	0.99	10	07/27/11 15:00	07/29/11 12:54		
6020 MET ICPMS	Analytical Method: EPA 6020 Preparation Method: EPA 3050							
Antimony	**0.50**	mg/kg	0.49	20	07/25/11 09:38	07/31/11 16:11	7440-36-0	
Arsenic	**7.8**	mg/kg	0.49	20	07/25/11 09:38	07/31/11 16:11	7440-38-2	
Barium	**239**	mg/kg	0.29	20	07/25/11 09:38	07/31/11 16:11	7440-39-3	
Cadmium	**<0.078**	mg/kg	0.078	20	07/25/11 09:38	07/31/11 16:11	7440-43-9	
Chromium	**12.9**	mg/kg	0.49	20	07/25/11 09:38	07/31/11 16:11	7440-47-3	
Copper	**8.9**	mg/kg	0.49	20	07/25/11 09:38	07/31/11 16:11	7440-50-8	
Iron	**20400**	mg/kg	48.7	20	07/25/11 09:38	07/31/11 16:11	7439-89-6	
Lead	**11.8**	mg/kg	0.097	20	07/25/11 09:38	07/31/11 16:11	7439-92-1	
Manganese	**192**	mg/kg	0.49	20	07/25/11 09:38	07/31/11 16:11	7439-96-5	
Nickel	**13.0**	mg/kg	0.49	20	07/25/11 09:38	07/31/11 16:11	7440-02-0	
Silver	**<0.49**	mg/kg	0.49	20	07/25/11 09:38	07/31/11 16:11	7440-22-4	
Zinc	**36.9**	mg/kg	4.9	20	07/25/11 09:38	07/31/11 16:11	7440-66-6	
7471 Mercury	Analytical Method: EPA 7471 Preparation Method: EPA 7471							
Mercury	**<0.024**	mg/kg	0.024	1	07/28/11 19:33	07/31/11 12:30	7439-97-6	
Dry Weight	Analytical Method: % Moisture							
Percent Moisture	**21.6**	%	0.10	1		07/21/11 00:00		
353.2 Nitrate + Nitrite pres.	Analytical Method: ASA 33-3.2/EPA 353.2							
Available Nitrate	**<5.0**	mg/kg	5.0	1		07/26/11 17:54		
Coarse	Analytical Method: ASTM D421							
Coarse Fragment	**27.3**	% (w/w)	0.10	1		07/26/11 12:15		
Organic Matter MT ASA 29	Analytical Method: ASA 29-3.5.2							
Organic Matter	**3.4**	% (w/w)	0.10	1		07/21/11 16:50		
ASA 10-3.2 pH	Analytical Method: ASA 10-3.2							
pH, Saturated Paste	**7.0**	Std. Units	0.10	1		07/27/11 17:29		
SM4500P-E, Total Phosphorus	Analytical Method: ASA 24-5.4/SM4500							
Available Phosphorus	**14.7**	mg/kg	2.0	2		07/25/11 14:37	7723-14-0	
Sobek Acid Base Potential	Analytical Method: Modified Sobek 3.2							
Neutralization Potential	**6.2**	tons/1000	0.50	1		07/29/11 00:00		

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ANALYTICAL RESULTS

Project: Black Pine Mine
Pace Project No.: 10163246

Sample: BP-RY-SS-02-02 **Lab ID: 10163246005** Collected: 07/12/11 08:55 Received: 07/13/11 09:00 Matrix: Solid

Results reported on a "dry-weight" basis

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
Sobek Extractable Sulfur	Analytical Method: Modified Sobek 3.2							
Sulfur, HCl Extractable	**<0.050**	% (w/w)	0.050	1		07/26/11 15:00		
Sulfur, HNO3 Extractable	**<0.050**	% (w/w)	0.050	1		07/26/11 15:00		
Sulfur, Hot Water Extractable	**<0.050**	% (w/w)	0.050	1		07/26/11 15:00		
Sulfur, Residual	**<0.050**	% (w/w)	0.050	1		07/26/11 15:00		
Total Sulfur	**<0.050**	% (w/w)	0.050	1		07/26/11 15:00		
Sobek Calculations	Analytical Method: Modified Sobek 3.2							
Acid/Base Potential	**6.2**	tons/1000		1		07/26/11 15:00		
Acid Potential	**<4.3**	tons/1000	4.3	1		07/26/11 15:00		
Lime Requirement	**8.2**	tons/1000	5.4	1		07/26/11 15:00		
SMP Lime Requirement	**5.9**	tons/1000	0.0	1		07/26/11 15:00		
Sobek SMP Buffer pH	Analytical Method: Modified Sobek 3.2							
SMP Buffer pH	**5.8**	Std. Units	0.10	1		07/26/11 15:00		
ASA10-3.3 Specific Conductance	Analytical Method: ASA 10-3.3							
Sp.Conductance Saturated Paste	**0.12**	mmhos/cm	0.010	1		07/27/11 12:56		

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ANALYTICAL RESULTS

Project: Black Pine Mine
Pace Project No.: 10163246

Sample: BP-RY-SS-04-00 **Lab ID: 10163246006** Collected: 07/12/11 11:28 Received: 07/13/11 09:00 Matrix: Solid

Results reported on a "dry-weight" basis

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
6010 MET ICP, MDEQ Potassium	Analytical Method: CLPICPAES Preparation Method: ASA 13-3.5.2.2							
Potassium	**<180**	mg/kg	180	5	08/01/11 17:34	08/01/11 18:27	7440-09-7	
Cation Exchange Capacity	Analytical Method: EPA 9081							
Cation Exchange Capacity	**21.1**	meq/100g	0.99	10	07/27/11 15:00	07/29/11 12:57		
6020 MET ICPMS	Analytical Method: EPA 6020 Preparation Method: EPA 3050							
Antimony	**158**	mg/kg	0.54	20	07/25/11 09:38	07/31/11 16:18	7440-36-0	
Arsenic	**74.7**	mg/kg	0.54	20	07/25/11 09:38	07/31/11 16:18	7440-38-2	
Barium	**247**	mg/kg	0.33	20	07/25/11 09:38	07/31/11 16:18	7440-39-3	
Cadmium	**2.4**	mg/kg	0.087	20	07/25/11 09:38	07/31/11 16:18	7440-43-9	
Chromium	**3.4**	mg/kg	0.54	20	07/25/11 09:38	07/31/11 16:18	7440-47-3	
Copper	**82.5**	mg/kg	0.54	20	07/25/11 09:38	07/31/11 16:18	7440-50-8	
Iron	**16000**	mg/kg	54.3	20	07/25/11 09:38	07/31/11 16:18	7439-89-6	
Lead	**1030**	mg/kg	0.54	100	07/25/11 09:38	07/31/11 16:21	7439-92-1	
Manganese	**1300**	mg/kg	2.7	100	07/25/11 09:38	07/31/11 16:21	7439-96-5	
Nickel	**8.3**	mg/kg	0.54	20	07/25/11 09:38	07/31/11 16:18	7440-02-0	
Silver	**2.7**	mg/kg	0.54	20	07/25/11 09:38	07/31/11 16:18	7440-22-4	
Zinc	**141**	mg/kg	5.4	20	07/25/11 09:38	07/31/11 16:18	7440-66-6	
7471 Mercury	Analytical Method: EPA 7471 Preparation Method: EPA 7471							
Mercury	**<0.021**	mg/kg	0.021	1	07/28/11 19:33	07/31/11 12:32	7439-97-6	
Dry Weight	Analytical Method: % Moisture							
Percent Moisture	**14.7**	%	0.10	1		07/21/11 00:00		
353.2 Nitrate + Nitrite pres.	Analytical Method: ASA 33-3.2/EPA 353.2							
Available Nitrate	**<5.0**	mg/kg	5.0	1		07/26/11 17:56		
Coarse	Analytical Method: ASTM D421							
Coarse Fragment	**54.6**	% (w/w)	0.10	1		07/26/11 12:15		
Organic Matter MT ASA 29	Analytical Method: ASA 29-3.5.2							
Organic Matter	**3.1**	% (w/w)	0.10	1		07/22/11 11:05		
ASA 10-3.2 pH	Analytical Method: ASA 10-3.2							
pH, Saturated Paste	**7.0**	Std. Units	0.10	1		07/27/11 17:30		
SM4500P-E, Total Phosphorus	Analytical Method: ASA 24-5.4/SM4500							
Available Phosphorus	**5.3**	mg/kg	2.0	2		07/25/11 14:38	7723-14-0	
Sobek Acid Base Potential	Analytical Method: Modified Sobek 3.2							
Neutralization Potential	**7.0**	tons/1000	0.50	1		07/29/11 00:00		

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ANALYTICAL RESULTS

Project: Black Pine Mine
Pace Project No.: 10163246

Sample: BP-RY-SS-04-00 **Lab ID: 10163246006** Collected: 07/12/11 11:28 Received: 07/13/11 09:00 Matrix: Solid

Results reported on a "dry-weight" basis

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
Sobek Extractable Sulfur	Analytical Method: Modified Sobek 3.2							
Sulfur, HCl Extractable	**<0.050**	% (w/w)	0.050	1		07/26/11 15:00		
Sulfur, HNO3 Extractable	**<0.050**	% (w/w)	0.050	1		07/26/11 15:00		
Sulfur, Hot Water Extractable	**<0.050**	% (w/w)	0.050	1		07/26/11 15:00		
Sulfur, Residual	**<0.050**	% (w/w)	0.050	1		07/26/11 15:00		
Total Sulfur	**<0.050**	% (w/w)	0.050	1		07/26/11 15:00		
Sobek Calculations	Analytical Method: Modified Sobek 3.2							
Acid/Base Potential	**7.0**	tons/1000		1		07/26/11 15:00		
Acid Potential	**<4.3**	tons/1000	4.3	1		07/26/11 15:00		
Lime Requirement	**7.0**	tons/1000	5.4	1		07/26/11 15:00		
SMP Lime Requirement	**5.3**	tons/1000	0.0	1		07/26/11 15:00		
Sobek SMP Buffer pH	Analytical Method: Modified Sobek 3.2							
SMP Buffer pH	**6.2**	Std. Units	0.10	1		07/26/11 15:00		
ASA10-3.3 Specific Conductance	Analytical Method: ASA 10-3.3							
Sp.Conductance Saturated Paste	**0.14**	mmhos/cm	0.010	1		07/27/11 12:56		

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ANALYTICAL RESULTS

Project: Black Pine Mine
Pace Project No.: 10163246

Sample: BP-RY-SS-04-02 **Lab ID: 10163246007** Collected: 07/12/11 11:30 Received: 07/13/11 09:00 Matrix: Solid

Results reported on a "dry-weight" basis

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
6010 MET ICP, MDEQ Potassium	Analytical Method: CLPICPAES Preparation Method: ASA 13-3.5.2.2							
Potassium	**<334**	mg/kg	334	5	08/01/11 17:34	08/01/11 18:31	7440-09-7	
Cation Exchange Capacity	Analytical Method: EPA 9081							
Cation Exchange Capacity	**13.5**	meq/100g	1.0	10	07/27/11 15:00	07/29/11 13:00		
6020 MET ICPMS	Analytical Method: EPA 6020 Preparation Method: EPA 3050							
Antimony	**68.3**	mg/kg	0.42	20	07/25/11 09:38	07/31/11 16:25	7440-36-0	
Arsenic	**78.6**	mg/kg	0.42	20	07/25/11 09:38	07/31/11 16:25	7440-38-2	
Barium	**161**	mg/kg	0.25	20	07/25/11 09:38	07/31/11 16:25	7440-39-3	
Cadmium	**1.4**	mg/kg	0.067	20	07/25/11 09:38	07/31/11 16:25	7440-43-9	
Chromium	**2.2**	mg/kg	0.42	20	07/25/11 09:38	07/31/11 16:25	7440-47-3	
Copper	**209**	mg/kg	0.42	20	07/25/11 09:38	07/31/11 16:25	7440-50-8	
Iron	**17400**	mg/kg	41.9	20	07/25/11 09:38	07/31/11 16:25	7439-89-6	
Lead	**751**	mg/kg	0.42	100	07/25/11 09:38	07/31/11 16:28	7439-92-1	
Manganese	**992**	mg/kg	2.1	100	07/25/11 09:38	07/31/11 16:28	7439-96-5	
Nickel	**7.1**	mg/kg	0.42	20	07/25/11 09:38	07/31/11 16:25	7440-02-0	
Silver	**5.6**	mg/kg	0.42	20	07/25/11 09:38	07/31/11 16:25	7440-22-4	
Zinc	**134**	mg/kg	4.2	20	07/25/11 09:38	07/31/11 16:25	7440-66-6	
7471 Mercury	Analytical Method: EPA 7471 Preparation Method: EPA 7471							
Mercury	**0.33**	mg/kg	0.021	1	07/28/11 19:33	07/31/11 12:44	7439-97-6	
Dry Weight	Analytical Method: % Moisture							
Percent Moisture	**9.5**	%	0.10	1		07/21/11 00:00		
353.2 Nitrate + Nitrite pres.	Analytical Method: ASA 33-3.2/EPA 353.2							
Available Nitrate	**<5.0**	mg/kg	5.0	1		07/26/11 17:58		
Coarse	Analytical Method: ASTM D421							
Coarse Fragment	**33.1**	% (w/w)	0.10	1		07/26/11 12:15		
Organic Matter MT ASA 29	Analytical Method: ASA 29-3.5.2							
Organic Matter	**0.15**	% (w/w)	0.10	1		07/21/11 16:50		
ASA 10-3.2 pH	Analytical Method: ASA 10-3.2							
pH, Saturated Paste	**5.8**	Std. Units	0.10	1		07/27/11 17:30		
SM4500P-E, Total Phosphorus	Analytical Method: ASA 24-5.4/SM4500							
Available Phosphorus	**3.2**	mg/kg	1.0	1		07/25/11 14:39	7723-14-0	
Sobek Acid Base Potential	Analytical Method: Modified Sobek 3.2							
Neutralization Potential	**4.0**	tons/1000	0.50	1		07/29/11 00:00		

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ANALYTICAL RESULTS

Project: Black Pine Mine
Pace Project No.: 10163246

Sample: BP-RY-SS-04-02 **Lab ID: 10163246007** Collected: 07/12/11 11:30 Received: 07/13/11 09:00 Matrix: Solid

Results reported on a "dry-weight" basis

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
Sobek Extractable Sulfur	Analytical Method: Modified Sobek 3.2							
Sulfur, HCl Extractable	**<0.050**	% (w/w)	0.050	1		07/26/11 15:00		
Sulfur, HNO3 Extractable	**<0.050**	% (w/w)	0.050	1		07/26/11 15:00		
Sulfur, Hot Water Extractable	**<0.050**	% (w/w)	0.050	1		07/26/11 15:00		
Sulfur, Residual	**<0.050**	% (w/w)	0.050	1		07/26/11 15:00		
Total Sulfur	**<0.050**	% (w/w)	0.050	1		07/26/11 15:00		
Sobek Calculations	Analytical Method: Modified Sobek 3.2							
Acid/Base Potential	**4.0**	tons/1000		1		07/26/11 15:00		
Acid Potential	**<4.3**	tons/1000	4.3	1		07/26/11 15:00		
Lime Requirement	**<5.4**	tons/1000	5.4	1		07/26/11 15:00		
SMP Lime Requirement	**1**	tons/1000	0.0	1		07/26/11 15:00		
Sobek SMP Buffer pH	Analytical Method: Modified Sobek 3.2							
SMP Buffer pH	**6.8**	Std. Units	0.10	1		07/26/11 15:00		
ASA10-3.3 Specific Conductance	Analytical Method: ASA 10-3.3							
Sp.Conductance Saturated Paste	**0.10**	mmhos/cm	0.010	1		07/27/11 12:56		

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ANALYTICAL RESULTS

Project: Black Pine Mine
Pace Project No.: 10163246

Sample: BP-RY-SS-04-10 **Lab ID: 10163246008** Collected: 07/12/11 11:33 Received: 07/13/11 09:00 Matrix: Solid

Results reported on a "dry-weight" basis

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
6010 MET ICP, MDEQ Potassium	Analytical Method: CLPICPAES Preparation Method: ASA 13-3.5.2.2							
Potassium	**160**	mg/kg	119	5	08/01/11 17:34	08/01/11 18:36	7440-09-7	
Cation Exchange Capacity	Analytical Method: EPA 9081							
Cation Exchange Capacity	**12.2**	meq/100g	0.99	10	07/27/11 15:00	07/29/11 13:04		
6020 MET ICPMS	Analytical Method: EPA 6020 Preparation Method: EPA 3050							
Antimony	**36.7**	mg/kg	0.48	20	07/25/11 09:38	07/31/11 16:32	7440-36-0	
Arsenic	**33.2**	mg/kg	0.48	20	07/25/11 09:38	07/31/11 16:32	7440-38-2	
Barium	**96.4**	mg/kg	0.29	20	07/25/11 09:38	07/31/11 16:32	7440-39-3	
Cadmium	**0.72**	mg/kg	0.076	20	07/25/11 09:38	07/31/11 16:32	7440-43-9	
Chromium	**5.2**	mg/kg	0.48	20	07/25/11 09:38	07/31/11 16:32	7440-47-3	
Copper	**123**	mg/kg	0.48	20	07/25/11 09:38	07/31/11 16:32	7440-50-8	
Iron	**12600**	mg/kg	47.6	20	07/25/11 09:38	07/31/11 16:32	7439-89-6	
Lead	**256**	mg/kg	0.095	20	07/25/11 09:38	07/31/11 16:32	7439-92-1	
Manganese	**362**	mg/kg	0.48	20	07/25/11 09:38	07/31/11 16:32	7439-96-5	
Nickel	**10.8**	mg/kg	0.48	20	07/25/11 09:38	07/31/11 16:32	7440-02-0	
Silver	**2.6**	mg/kg	0.48	20	07/25/11 09:38	07/31/11 16:32	7440-22-4	
Zinc	**104**	mg/kg	4.8	20	07/25/11 09:38	07/31/11 16:32	7440-66-6	
7471 Mercury	Analytical Method: EPA 7471 Preparation Method: EPA 7471							
Mercury	**0.18**	mg/kg	0.021	1	07/28/11 19:33	07/31/11 12:46	7439-97-6	
Dry Weight	Analytical Method: % Moisture							
Percent Moisture	**7.0**	%	0.10	1		07/21/11 00:00		
353.2 Nitrate + Nitrite pres.	Analytical Method: ASA 33-3.2/EPA 353.2							
Available Nitrate	**<5.0**	mg/kg	5.0	1		07/26/11 17:59		
Coarse	Analytical Method: ASTM D421							
Coarse Fragment	**25.1**	% (w/w)	0.10	1		07/26/11 12:15		
Organic Matter MT ASA 29	Analytical Method: ASA 29-3.5.2							
Organic Matter	**0.12**	% (w/w)	0.10	1		07/21/11 16:50		
ASA 10-3.2 pH	Analytical Method: ASA 10-3.2							
pH, Saturated Paste	**6.9**	Std. Units	0.10	1		07/27/11 17:31		
SM4500P-E, Total Phosphorus	Analytical Method: ASA 24-5.4/SM4500							
Available Phosphorus	**4.5**	mg/kg	2.0	2		07/25/11 14:41	7723-14-0	
Sobek Acid Base Potential	Analytical Method: Modified Sobek 3.2							
Neutralization Potential	**3.0**	tons/1000	0.50	1		07/29/11 00:00		

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ANALYTICAL RESULTS

Project: Black Pine Mine
Pace Project No.: 10163246

Sample: BP-RY-SS-04-10 **Lab ID: 10163246008** Collected: 07/12/11 11:33 Received: 07/13/11 09:00 Matrix: Solid

Results reported on a "dry-weight" basis

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
Sobek Extractable Sulfur	Analytical Method: Modified Sobek 3.2							
Sulfur, HCl Extractable	**<0.050**	% (w/w)	0.050	1		07/26/11 15:00		
Sulfur, HNO3 Extractable	**<0.050**	% (w/w)	0.050	1		07/26/11 15:00		
Sulfur, Hot Water Extractable	**<0.050**	% (w/w)	0.050	1		07/26/11 15:00		
Sulfur, Residual	**<0.050**	% (w/w)	0.050	1		07/26/11 15:00		
Total Sulfur	**<0.050**	% (w/w)	0.050	1		07/26/11 15:00		
Sobek Calculations	Analytical Method: Modified Sobek 3.2							
Acid/Base Potential	**3.0**	tons/1000		1		07/26/11 15:00		
Acid Potential	**<4.3**	tons/1000	4.3	1		07/26/11 15:00		
Lime Requirement	**<5.4**	tons/1000	5.4	1		07/26/11 15:00		
SMP Lime Requirement	**0**	tons/1000	0.0	1		07/26/11 15:00		
Sobek SMP Buffer pH	Analytical Method: Modified Sobek 3.2							
SMP Buffer pH	**7.0**	Std. Units	0.10	1		07/26/11 15:00		
ASA10-3.3 Specific Conductance	Analytical Method: ASA 10-3.3							
Sp.Conductance Saturated Paste	**0.12**	mmhos/cm	0.010	1		07/27/11 12:56		

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ANALYTICAL RESULTS

Project: Black Pine Mine
Pace Project No.: 10163246

Sample: BP-RY-SS-05-00 **Lab ID: 10163246009** Collected: 07/12/11 12:28 Received: 07/13/11 09:00 Matrix: Solid

Results reported on a "dry-weight" basis

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
6010 MET ICP, MDEQ Potassium	Analytical Method: CLPICPAES Preparation Method: ASA 13-3.5.2.2							
Potassium	**294**	mg/kg	152	5	08/01/11 17:34	08/01/11 18:40	7440-09-7	
Cation Exchange Capacity	Analytical Method: EPA 9081							
Cation Exchange Capacity	**34.2**	meq/100g	0.99	10	07/27/11 15:00	07/29/11 13:13		
6020 MET ICPMS	Analytical Method: EPA 6020 Preparation Method: EPA 3050							
Antimony	**2.0**	mg/kg	0.49	20	07/25/11 09:38	07/31/11 16:53	7440-36-0	
Arsenic	**11.1**	mg/kg	0.49	20	07/25/11 09:38	07/31/11 16:53	7440-38-2	
Barium	**285**	mg/kg	0.30	20	07/25/11 09:38	07/31/11 16:53	7440-39-3	
Cadmium	**1.0**	mg/kg	0.079	20	07/25/11 09:38	07/31/11 16:53	7440-43-9	
Chromium	**6.2**	mg/kg	0.49	20	07/25/11 09:38	07/31/11 16:53	7440-47-3	
Copper	**12.6**	mg/kg	0.49	20	07/25/11 09:38	07/31/11 16:53	7440-50-8	
Iron	**11800**	mg/kg	49.3	20	07/25/11 09:38	07/31/11 16:53	7439-89-6	
Lead	**27.9**	mg/kg	0.099	20	07/25/11 09:38	07/31/11 16:53	7439-92-1	
Manganese	**1040**	mg/kg	2.5	100	07/25/11 09:38	07/31/11 16:56	7439-96-5	
Nickel	**12.2**	mg/kg	0.49	20	07/25/11 09:38	07/31/11 16:53	7440-02-0	
Silver	**<0.49**	mg/kg	0.49	20	07/25/11 09:38	07/31/11 16:53	7440-22-4	
Zinc	**85.3**	mg/kg	4.9	20	07/25/11 09:38	07/31/11 16:53	7440-66-6	
7471 Mercury	Analytical Method: EPA 7471 Preparation Method: EPA 7471							
Mercury	**<0.019**	mg/kg	0.019	1	07/28/11 19:33	07/31/11 12:48	7439-97-6	
Dry Weight	Analytical Method: % Moisture							
Percent Moisture	**5.3**	%	0.10	1		07/21/11 00:00		
353.2 Nitrate + Nitrite pres.	Analytical Method: ASA 33-3.2/EPA 353.2							
Available Nitrate	**<5.0**	mg/kg	5.0	1		07/26/11 18:01		
Coarse	Analytical Method: ASTM D421							
Coarse Fragment	**54.7**	% (w/w)	0.10	1		07/26/11 12:15		
Organic Matter MT ASA 29	Analytical Method: ASA 29-3.5.2							
Organic Matter	**5.6**	% (w/w)	0.10	1		07/21/11 16:50		
ASA 10-3.2 pH	Analytical Method: ASA 10-3.2							
pH, Saturated Paste	**7.3**	Std. Units	0.10	1		07/27/11 17:32		
SM4500P-E, Total Phosphorus	Analytical Method: ASA 24-5.4/SM4500							
Available Phosphorus	**10.2**	mg/kg	2.0	2		07/25/11 14:42	7723-14-0	
Sobek Acid Base Potential	Analytical Method: Modified Sobek 3.2							
Neutralization Potential	**7.0**	tons/1000	0.50	1		07/29/11 00:00		

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ANALYTICAL RESULTS

Project: Black Pine Mine
Pace Project No.: 10163246

Sample: BP-RY-SS-05-00 **Lab ID: 10163246009** Collected: 07/12/11 12:28 Received: 07/13/11 09:00 Matrix: Solid

Results reported on a "dry-weight" basis

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
Sobek Extractable Sulfur	Analytical Method: Modified Sobek 3.2							
Sulfur, HCl Extractable	**<0.050**	% (w/w)	0.050	1		07/26/11 15:00		
Sulfur, HNO3 Extractable	**<0.050**	% (w/w)	0.050	1		07/26/11 15:00		
Sulfur, Hot Water Extractable	**<0.050**	% (w/w)	0.050	1		07/26/11 15:00		
Sulfur, Residual	**<0.050**	% (w/w)	0.050	1		07/26/11 15:00		
Total Sulfur	**<0.050**	% (w/w)	0.050	1		07/26/11 15:00		
Sobek Calculations	Analytical Method: Modified Sobek 3.2							
Acid/Base Potential	**7.0**	tons/1000		1		07/26/11 15:00		
Acid Potential	**<4.3**	tons/1000	4.3	1		07/26/11 15:00		
Lime Requirement	**8.6**	tons/1000	5.4	1		07/26/11 15:00		
SMP Lime Requirement	**6.1**	tons/1000	0.0	1		07/26/11 15:00		
Sobek SMP Buffer pH	Analytical Method: Modified Sobek 3.2							
SMP Buffer pH	**6.1**	Std. Units	0.10	1		07/26/11 15:00		
ASA10-3.3 Specific Conductance	Analytical Method: ASA 10-3.3							
Sp.Conductance Saturated Paste	**0.19**	mmhos/cm	0.010	1		07/27/11 12:56		

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ANALYTICAL RESULTS

Project: Black Pine Mine
Pace Project No.: 10163246

Sample: BP-RY-SS-05-02 **Lab ID: 10163246010** Collected: 07/12/11 12:30 Received: 07/13/11 09:00 Matrix: Solid

Results reported on a "dry-weight" basis

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
6010 MET ICP, MDEQ Potassium	Analytical Method: CLPICPAES Preparation Method: ASA 13-3.5.2.2							
Potassium	**<118**	mg/kg	118	5	08/01/11 17:34	08/01/11 18:45	7440-09-7	
Cation Exchange Capacity	Analytical Method: EPA 9081							
Cation Exchange Capacity	**13.8**	meq/100g	0.98	10	07/27/11 15:00	07/29/11 13:16		
6020 MET ICPMS	Analytical Method: EPA 6020 Preparation Method: EPA 3050							
Antimony	**0.89**	mg/kg	0.47	20	07/25/11 09:38	07/31/11 17:00	7440-36-0	
Arsenic	**6.8**	mg/kg	0.47	20	07/25/11 09:38	07/31/11 17:00	7440-38-2	
Barium	**116**	mg/kg	0.28	20	07/25/11 09:38	07/31/11 17:00	7440-39-3	
Cadmium	**0.23**	mg/kg	0.076	20	07/25/11 09:38	07/31/11 17:00	7440-43-9	
Chromium	**10.1**	mg/kg	0.47	20	07/25/11 09:38	07/31/11 17:00	7440-47-3	
Copper	**7.5**	mg/kg	0.47	20	07/25/11 09:38	07/31/11 17:00	7440-50-8	
Iron	**13000**	mg/kg	47.3	20	07/25/11 09:38	07/31/11 17:00	7439-89-6	
Lead	**15.3**	mg/kg	0.095	20	07/25/11 09:38	07/31/11 17:00	7439-92-1	
Manganese	**223**	mg/kg	0.47	20	07/25/11 09:38	07/31/11 17:00	7439-96-5	
Nickel	**11.2**	mg/kg	0.47	20	07/25/11 09:38	07/31/11 17:00	7440-02-0	
Silver	**<0.47**	mg/kg	0.47	20	07/25/11 09:38	07/31/11 17:00	7440-22-4	
Zinc	**49.9**	mg/kg	4.7	20	07/25/11 09:38	07/31/11 17:00	7440-66-6	
7471 Mercury	Analytical Method: EPA 7471 Preparation Method: EPA 7471							
Mercury	**<0.022**	mg/kg	0.022	1	07/28/11 19:33	07/31/11 12:50	7439-97-6	
Dry Weight	Analytical Method: % Moisture							
Percent Moisture	**10.5**	%	0.10	1		07/21/11 00:00		
353.2 Nitrate + Nitrite pres.	Analytical Method: ASA 33-3.2/EPA 353.2							
Available Nitrate	**<5.0**	mg/kg	5.0	1		07/26/11 18:02		
Coarse	Analytical Method: ASTM D421							
Coarse Fragment	**35.0**	% (w/w)	0.10	1		07/26/11 12:15		
Organic Matter MT ASA 29	Analytical Method: ASA 29-3.5.2							
Organic Matter	**0.80**	% (w/w)	0.10	1		07/21/11 16:50		
ASA 10-3.2 pH	Analytical Method: ASA 10-3.2							
pH, Saturated Paste	**7.1**	Std. Units	0.10	1		07/27/11 17:34		
SM4500P-E, Total Phosphorus	Analytical Method: ASA 24-5.4/SM4500							
Available Phosphorus	**1.1**	mg/kg	1.0	1		07/25/11 14:43	7723-14-0	
Sobek Acid Base Potential	Analytical Method: Modified Sobek 3.2							
Neutralization Potential	**4.3**	tons/1000	0.50	1		07/29/11 00:00		

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ANALYTICAL RESULTS

Project: Black Pine Mine
Pace Project No.: 10163246

Sample: BP-RY-SS-05-02 **Lab ID: 10163246010** Collected: 07/12/11 12:30 Received: 07/13/11 09:00 Matrix: Solid

Results reported on a "dry-weight" basis

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
Sobek Extractable Sulfur	Analytical Method: Modified Sobek 3.2							
Sulfur, HCl Extractable	**<0.050**	% (w/w)	0.050	1		07/26/11 15:00		
Sulfur, HNO3 Extractable	**<0.050**	% (w/w)	0.050	1		07/26/11 15:00		
Sulfur, Hot Water Extractable	**<0.050**	% (w/w)	0.050	1		07/26/11 15:00		
Sulfur, Residual	**<0.050**	% (w/w)	0.050	1		07/26/11 15:00		
Total Sulfur	**<0.050**	% (w/w)	0.050	1		07/26/11 15:00		
Sobek Calculations	Analytical Method: Modified Sobek 3.2							
Acid/Base Potential	**4.3**	tons/1000		1		07/26/11 15:00		
Acid Potential	**<4.3**	tons/1000	4.3	1		07/26/11 15:00		
Lime Requirement	**<5.4**	tons/1000	5.4	1		07/26/11 15:00		
SMP Lime Requirement	**0**	tons/1000	0.0	1		07/26/11 15:00		
Sobek SMP Buffer pH	Analytical Method: Modified Sobek 3.2							
SMP Buffer pH	**7.0**	Std. Units	0.10	1		07/26/11 15:00		
ASA10-3.3 Specific Conductance	Analytical Method: ASA 10-3.3							
Sp.Conductance Saturated Paste	**0.17**	mmhos/cm	0.010	1		07/27/11 12:56		

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QUALITY CONTROL DATA

Project: Black Pine Mine
Pace Project No.: 10163246

QC Batch: MPRP/27469 Analysis Method: CLPICPAES
QC Batch Method: ASA 13-3.5.2.2 Analysis Description: CLPICPAES MET
Associated Lab Samples: 10163246001, 10163246002, 10163246003, 10163246004, 10163246005, 10163246006, 10163246007, 10163246008, 10163246009, 10163246010

METHOD BLANK: 1024549 Matrix: Solid
Associated Lab Samples: 10163246001, 10163246002, 10163246003, 10163246004, 10163246005, 10163246006, 10163246007, 10163246008, 10163246009, 10163246010

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Potassium	mg/kg	<124	124	08/01/11 17:43	

LABORATORY CONTROL SAMPLE & LCSD: 1024550 1024551

Parameter	Units	Spike Conc.	LCS Result	LCSD Result	LCS % Rec	LCSD % Rec	% Rec Limits	RPD	Max RPD	Qualifiers
Potassium	mg/kg	156	177	210	114	135	80-120	17	20	

SAMPLE DUPLICATE: 1024552

Parameter	Units	10163634008 Result	Dup Result	RPD	Max RPD	Qualifiers
Potassium	mg/kg	<116	<125		30	

SAMPLE DUPLICATE: 1024553

Parameter	Units	10163644010 Result	Dup Result	RPD	Max RPD	Qualifiers
Potassium	mg/kg	<123	<125		30	

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QUALITY CONTROL DATA

Project: Black Pine Mine
Pace Project No.: 10163246

QC Batch: ICP/14882 Analysis Method: EPA 9081
QC Batch Method: EPA 9081 Analysis Description: Cation Exchange Capacity
Associated Lab Samples: 10163246001, 10163246002, 10163246003, 10163246004, 10163246005, 10163246006, 10163246007, 10163246008, 10163246009, 10163246010

METHOD BLANK: 850915 Matrix: Solid
Associated Lab Samples: 10163246001, 10163246002, 10163246003, 10163246004, 10163246005, 10163246006, 10163246007, 10163246008, 10163246009, 10163246010

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Cation Exchange Capacity	meq/100g	<1.0	1.0	07/29/11 12:24	

LABORATORY CONTROL SAMPLE: 850916

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Cation Exchange Capacity	meq/100g	53.1	33.8	64	62-138	

SAMPLE DUPLICATE: 850917

Parameter	Units	10163246001 Result	Dup Result	RPD	Max RPD	Qualifiers
Cation Exchange Capacity	meq/100g	49.8	48.8	2	47	

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QUALITY CONTROL DATA

Project: Black Pine Mine
Pace Project No.: 10163246

QC Batch: MPRP/27163 Analysis Method: EPA 6020
QC Batch Method: EPA 3050 Analysis Description: 6020 MET
Associated Lab Samples: 10163246001, 10163246002, 10163246003, 10163246004, 10163246005, 10163246006, 10163246007, 10163246008, 10163246009, 10163246010

METHOD BLANK: 1014833 Matrix: Solid
Associated Lab Samples: 10163246001, 10163246002, 10163246003, 10163246004, 10163246005, 10163246006, 10163246007, 10163246008, 10163246009, 10163246010

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Antimony	mg/kg	<0.49	0.49	07/31/11 15:14	
Arsenic	mg/kg	<0.49	0.49	07/31/11 15:14	
Barium	mg/kg	<0.29	0.29	07/31/11 15:14	
Cadmium	mg/kg	<0.078	0.078	07/31/11 15:14	
Chromium	mg/kg	<0.49	0.49	07/31/11 15:14	
Copper	mg/kg	<0.49	0.49	07/31/11 15:14	
Iron	mg/kg	<48.5	48.5	07/31/11 15:14	
Lead	mg/kg	0.34	0.097	07/31/11 15:14	P8
Manganese	mg/kg	<0.49	0.49	07/31/11 15:14	
Nickel	mg/kg	<0.49	0.49	07/31/11 15:14	
Silver	mg/kg	<0.49	0.49	07/31/11 15:14	
Zinc	mg/kg	<4.9	4.9	07/31/11 15:14	

LABORATORY CONTROL SAMPLE: 1014834

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Antimony	mg/kg	16	17.7	111	75-125	
Arsenic	mg/kg	16	17.0	106	75-125	
Barium	mg/kg	16	18.0	113	75-125	
Cadmium	mg/kg	16	17.5	109	75-125	
Chromium	mg/kg	16	17.8	112	75-125	
Copper	mg/kg	16	17.9	112	75-125	
Iron	mg/kg	200	227	114	75-125	
Lead	mg/kg	16	17.8	111	75-125	
Manganese	mg/kg	16	18.2	114	75-125	
Nickel	mg/kg	16	18.3	114	75-125	
Silver	mg/kg	16	19.7	123	75-125	
Zinc	mg/kg	16	17.5	109	75-125	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 1014835 1014836

Parameter	Units	10163246001 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Antimony	mg/kg	0.60	19.6	19.5	9.8	8.9	47	43	75-125	10	20	M6
Arsenic	mg/kg	7.2	19.6	19.5	27.9	32.2	105	129	75-125	15	20	M6
Barium	mg/kg	248	19.6	19.5	334	511	437	1350	75-125	42	20	D6,M6
Cadmium	mg/kg	0.31	19.6	19.5	18.5	18.5	93	93	75-125	.3	20	
Chromium	mg/kg	4.4	19.6	19.5	24.9	25.9	104	111	75-125	4	20	

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QUALITY CONTROL DATA

Project: Black Pine Mine
Pace Project No.: 10163246

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 1014835 1014836

Parameter	Units	10163246001 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Copper	mg/kg	5.7	19.6	19.5	25.0	28.6	98	118	75-125	14	20	
Iron	mg/kg	6090	245	243	8220	10800	870	1930	75-125	27	20	D6,M6
Lead	mg/kg	5.4	19.6	19.5	25.3	28.9	101	120	75-125	13	20	
Manganese	mg/kg	782	19.6	19.5	1490	2350	3610	8050	75-125	45	20	D6,E, M6
Nickel	mg/kg	8.5	19.6	19.5	27.8	29.9	99	110	75-125	7	20	
Silver	mg/kg	<0.45	19.6	19.5	20.2	19.9	102	101	75-125	2	20	
Zinc	mg/kg	42.7	19.6	19.5	75.3	102	166	305	75-125	30	20	D6,M6

MATRIX SPIKE SAMPLE: 1014837

Parameter	Units	10163606001 Result	Spike Conc.	MS Result	MS % Rec	% Rec Limits	Qualifiers
Antimony	mg/kg	25.8	16.3	38.9	80	75-125	
Arsenic	mg/kg	143	16.3	50.6	-569	75-125	M6
Barium	mg/kg	132	16.3	164	198	75-125	M6
Cadmium	mg/kg	1.3	16.3	17.4	99	75-125	
Chromium	mg/kg	8.1	16.3	26.2	111	75-125	
Copper	mg/kg	547	16.3	697	924	75-125	M6
Iron	mg/kg	15000	204	15500	257	75-125	M6
Lead	mg/kg	339	16.3	169	-1040	75-125	M6
Manganese	mg/kg	352	16.3	300	-318	75-125	M6
Nickel	mg/kg	9.4	16.3	26.7	106	75-125	
Silver	mg/kg	3.3	16.3	21.4	111	75-125	
Zinc	mg/kg	85.6	16.3	107	132	75-125	M6

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QUALITY CONTROL DATA

Project: Black Pine Mine
Pace Project No.: 10163246

QC Batch: MERP/5632 Analysis Method: EPA 7471
QC Batch Method: EPA 7471 Analysis Description: 7471 Mercury
Associated Lab Samples: 10163246001, 10163246002, 10163246003, 10163246004, 10163246005, 10163246006, 10163246007, 10163246008, 10163246009, 10163246010

METHOD BLANK: 1014982 Matrix: Solid
Associated Lab Samples: 10163246001, 10163246002, 10163246003, 10163246004, 10163246005, 10163246006, 10163246007, 10163246008, 10163246009, 10163246010

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Mercury	mg/kg	<0.020	0.020	07/31/11 12:13	

LABORATORY CONTROL SAMPLE: 1014983

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Mercury	mg/kg	.48	0.48	100	80-120	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 1014984 1014985

Parameter	Units	10163246001 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Mercury	mg/kg	0.14	.51	.51	0.30	0.34	31	38	80-120	11	20	M1

MATRIX SPIKE SAMPLE: 1014986

Parameter	Units	10163483010 Result	Spike Conc.	MS Result	MS % Rec	% Rec Limits	Qualifiers
Mercury	mg/kg	3.6	.49	4.6	208	80-120	M6

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QUALITY CONTROL DATA

Project: Black Pine Mine
Pace Project No.: 10163246

QC Batch: MPRP/27229
QC Batch Method: % Moisture
Analysis Method: % Moisture
Analysis Description: Dry Weight/Percent Moisture
Associated Lab Samples: 10163246001

SAMPLE DUPLICATE: 1016815

Parameter	Units	10163138001 Result	Dup Result	RPD	Max RPD	Qualifiers
Percent Moisture	%	72.1	77.1	7	30	

SAMPLE DUPLICATE: 1016867

Parameter	Units	10163235013 Result	Dup Result	RPD	Max RPD	Qualifiers
Percent Moisture	%	19.5	15.4	23	30	

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QUALITY CONTROL DATA

Project: Black Pine Mine
Pace Project No.: 10163246

QC Batch: MPRP/27256 Analysis Method: % Moisture
QC Batch Method: % Moisture Analysis Description: Dry Weight/Percent Moisture
Associated Lab Samples: 10163246002, 10163246003, 10163246004, 10163246005, 10163246006, 10163246007, 10163246008, 10163246009, 10163246010

SAMPLE DUPLICATE: 1017553

Parameter	Units	10163864002 Result	Dup Result	RPD	Max RPD	Qualifiers
Percent Moisture	%	23.9	22.3	7	30	

SAMPLE DUPLICATE: 1017554

Parameter	Units	10163606003 Result	Dup Result	RPD	Max RPD	Qualifiers
Percent Moisture	%	15.4	16.0	4	30	

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QUALITY CONTROL DATA

Project: Black Pine Mine
Pace Project No.: 10163246

QC Batch: MT/6442 Analysis Method: ASA 33-3.2/EPA 353.2
QC Batch Method: ASA 33-3.2/EPA 353.2 Analysis Description: 353.2 Nitrate + Nitrite
Associated Lab Samples: 10163246001, 10163246002, 10163246003, 10163246004, 10163246005, 10163246006, 10163246007, 10163246008, 10163246009, 10163246010

METHOD BLANK: 1016641 Matrix: Solid
Associated Lab Samples: 10163246001, 10163246002, 10163246003, 10163246004, 10163246005, 10163246006, 10163246007, 10163246008, 10163246009, 10163246010

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Available Nitrate	mg/kg	<5.0	5.0	07/26/11 17:37	

LABORATORY CONTROL SAMPLE: 1016642

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Available Nitrate	mg/kg	25	24.0	96	76-124	

SAMPLE DUPLICATE: 1016643

Parameter	Units	10163246004 Result	Dup Result	RPD	Max RPD	Qualifiers
Available Nitrate	mg/kg	<5.0	<5.0		30	

SAMPLE DUPLICATE: 1016644

Parameter	Units	10163644008 Result	Dup Result	RPD	Max RPD	Qualifiers
Available Nitrate	mg/kg	<5.0	<5.0		30	

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QUALITY CONTROL DATA

Project: Black Pine Mine
Pace Project No.: 10163246

QC Batch: MT/6438 Analysis Method: ASA 29-3.5.2
QC Batch Method: ASA 29-3.5.2 Analysis Description: Organic Matter ASA 29
Associated Lab Samples: 10163246001, 10163246002, 10163246003, 10163246004, 10163246005, 10163246007, 10163246008, 10163246009, 10163246010

METHOD BLANK: 1016290 Matrix: Solid
Associated Lab Samples: 10163246001, 10163246002, 10163246003, 10163246004, 10163246005, 10163246007, 10163246008, 10163246009, 10163246010

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Organic Matter	% (w/w)	<0.10	0.10	07/21/11 16:50	

LABORATORY CONTROL SAMPLE: 1016291

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Organic Matter	% (w/w)	3.1	3.3	107	69-131	

SAMPLE DUPLICATE: 1016293

Parameter	Units	10163634008 Result	Dup Result	RPD	Max RPD	Qualifiers
Organic Matter	% (w/w)	0.13	<0.10		30	

SAMPLE DUPLICATE: 1018103

Parameter	Units	10163246002 Result	Dup Result	RPD	Max RPD	Qualifiers
Organic Matter	% (w/w)	3.3	3.2	2	30	

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QUALITY CONTROL DATA

Project: Black Pine Mine
Pace Project No.: 10163246

QC Batch: MT/6460
QC Batch Method: ASA 29-3.5.2
Analysis Method: ASA 29-3.5.2
Analysis Description: Organic Matter ASA 29
Associated Lab Samples: 10163246006

METHOD BLANK: 1017980 Matrix: Solid
Associated Lab Samples: 10163246006

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Organic Matter	% (w/w)	<0.10	0.10	07/22/11 11:05	

LABORATORY CONTROL SAMPLE: 1017981

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Organic Matter	% (w/w)	3.1	3.3	105	69-131	

SAMPLE DUPLICATE: 1016289

Parameter	Units	10163639012 Result	Dup Result	RPD	Max RPD	Qualifiers
Organic Matter	% (w/w)	2.9	3.0	4	30	

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QUALITY CONTROL DATA

Project: Black Pine Mine
Pace Project No.: 10163246

QC Batch: MT/6426 Analysis Method: ASA 10-3.2
QC Batch Method: ASA 10-3.2 Analysis Description: ASA 10-3.2 pH saturated paste
Associated Lab Samples: 10163246001, 10163246002, 10163246003, 10163246004, 10163246005, 10163246006, 10163246007, 10163246008, 10163246009, 10163246010

SAMPLE DUPLICATE: 1017424

Parameter	Units	10163246004 Result	Dup Result	RPD	Max RPD	Qualifiers
pH, Saturated Paste	Std. Units	7.0	6.9	.7	20	

SAMPLE DUPLICATE: 1017425

Parameter	Units	10163645001 Result	Dup Result	RPD	Max RPD	Qualifiers
pH, Saturated Paste	Std. Units	6.9	6.7	2	20	

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QUALITY CONTROL DATA

Project: Black Pine Mine
Pace Project No.: 10163246

QC Batch: MT/6443 Analysis Method: ASA 24-5.4/SM4500
QC Batch Method: ASA 24-5.4/SM4500 Analysis Description: SM4500P-E, Total Phosphorus
Associated Lab Samples: 10163246001, 10163246002, 10163246003, 10163246004, 10163246005, 10163246006, 10163246007, 10163246008, 10163246009, 10163246010

METHOD BLANK: 1016645 Matrix: Solid
Associated Lab Samples: 10163246001, 10163246002, 10163246003, 10163246004, 10163246005, 10163246006, 10163246007, 10163246008, 10163246009, 10163246010

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Available Phosphorus	mg/kg	<1.0	1.0	07/25/11 14:30	

LABORATORY CONTROL SAMPLE: 1016646

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Available Phosphorus	mg/kg	10	8.0	80	56-144	

SAMPLE DUPLICATE: 1016647

Parameter	Units	10163246004 Result	Dup Result	RPD	Max RPD	Qualifiers
Available Phosphorus	mg/kg	2.8	3.1	9	30	

SAMPLE DUPLICATE: 1016648

Parameter	Units	10163644006 Result	Dup Result	RPD	Max RPD	Qualifiers
Available Phosphorus	mg/kg	1.4	1.4	3	30	

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QUALITY CONTROL DATA

Project: Black Pine Mine
Pace Project No.: 10163246

QC Batch: MT/6480 Analysis Method: Modified Sobek 3.2
QC Batch Method: Modified Sobek 3.2 Analysis Description: Sobek Acid Base Potential
Associated Lab Samples: 10163246001, 10163246002, 10163246003, 10163246004, 10163246005, 10163246006, 10163246007, 10163246008, 10163246009, 10163246010

METHOD BLANK: 1019986 Matrix: Solid
Associated Lab Samples: 10163246001, 10163246002, 10163246003, 10163246004, 10163246005, 10163246006, 10163246007, 10163246008, 10163246009, 10163246010

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Neutralization Potential	tons/1000	<0.5	0.50	07/29/11 00:00	

SAMPLE DUPLICATE: 1019631

Parameter	Units	10163606002 Result	Dup Result	RPD	Max RPD	Qualifiers
Neutralization Potential	tons/1000	1.5	1.7			

SAMPLE DUPLICATE: 1019632

Parameter	Units	10163246007 Result	Dup Result	RPD	Max RPD	Qualifiers
Neutralization Potential	tons/1000	4.0	5.7			

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QUALITY CONTROL DATA

Project: Black Pine Mine
Pace Project No.: 10163246

QC Batch: MT/6452 Analysis Method: Modified Sobek 3.2
QC Batch Method: Modified Sobek 3.2 Analysis Description: Sobek Extractable Sulfur
Associated Lab Samples: 10163246001, 10163246002, 10163246003, 10163246004, 10163246005, 10163246006, 10163246007, 10163246008, 10163246009, 10163246010

METHOD BLANK: 1017262 Matrix: Solid
Associated Lab Samples: 10163246001, 10163246002, 10163246003, 10163246004, 10163246005, 10163246006, 10163246007, 10163246008, 10163246009, 10163246010

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Total Sulfur	% (w/w)	<0.050	0.050	07/29/11 16:11	

SAMPLE DUPLICATE: 1017264

Parameter	Units	10163606002 Result	Dup Result	RPD	Max RPD	Qualifiers
Total Sulfur	% (w/w)	0.228	0.211	8		

SAMPLE DUPLICATE: 1017265

Parameter	Units	10163246007 Result	Dup Result	RPD	Max RPD	Qualifiers
Total Sulfur	% (w/w)	<0.050	<0.050			

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QUALITY CONTROL DATA

Project: Black Pine Mine
Pace Project No.: 10163246

QC Batch: MT/6481 Analysis Method: Modified Sobek 3.2
QC Batch Method: Modified Sobek 3.2 Analysis Description: Sobek SMP Buffer pH
Associated Lab Samples: 10163246001, 10163246002, 10163246003, 10163246004, 10163246005, 10163246006, 10163246007, 10163246008, 10163246009, 10163246010

LABORATORY CONTROL SAMPLE: 1019634

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
SMP Buffer pH	Std. Units		7.0			

SAMPLE DUPLICATE: 1019635

Parameter	Units	10163606002 Result	Dup Result	RPD	Max RPD	Qualifiers
SMP Buffer pH	Std. Units	6.6	6.6	0	20	

SAMPLE DUPLICATE: 1019636

Parameter	Units	10163246007 Result	Dup Result	RPD	Max RPD	Qualifiers
SMP Buffer pH	Std. Units	6.8	6.8	.7	20	

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QUALITY CONTROL DATA

Project: Black Pine Mine
Pace Project No.: 10163246

QC Batch: MT/6547 Analysis Method: ASA 10-3.3
QC Batch Method: ASA 10-3.3 Analysis Description: ASA 10-3.3 Specific Conductance
Associated Lab Samples: 10163246001, 10163246002, 10163246003, 10163246004, 10163246005, 10163246006, 10163246007, 10163246008, 10163246009, 10163246010

METHOD BLANK: 1022940 Matrix: Water
Associated Lab Samples: 10163246001, 10163246002, 10163246003, 10163246004, 10163246005, 10163246006, 10163246007, 10163246008, 10163246009, 10163246010

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Sp.Conductance Saturated Paste	mmhos/cm	<0.010	0.010	07/27/11 12:56	

LABORATORY CONTROL SAMPLE: 1022941

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Sp.Conductance Saturated Paste	mmhos/cm	.85	0.80	94	53-147	

SAMPLE DUPLICATE: 1022942

Parameter	Units	10163246004 Result	Dup Result	RPD	Max RPD	Qualifiers
Sp.Conductance Saturated Paste	mmhos/cm	0.091	0.088	3	20	

SAMPLE DUPLICATE: 1022943

Parameter	Units	10163645001 Result	Dup Result	RPD	Max RPD	Qualifiers
Sp.Conductance Saturated Paste	mmhos/cm	0.20	0.14	33	20	D6

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QUALIFIERS

Project: Black Pine Mine
Pace Project No.: 10163246

DEFINITIONS

DF - Dilution Factor, if reported, represents the factor applied to the reported data due to changes in sample preparation, dilution of the sample aliquot, or moisture content.

ND - Not Detected at or above adjusted reporting limit.

J - Estimated concentration above the adjusted method detection limit and below the adjusted reporting limit.

MDL - Adjusted Method Detection Limit.

S - Surrogate

1,2-Diphenylhydrazine (8270 listed analyte) decomposes to Azobenzene.

Consistent with EPA guidelines, unrounded data are displayed and have been used to calculate % recovery and RPD values.

LCS(D) - Laboratory Control Sample (Duplicate)

MS(D) - Matrix Spike (Duplicate)

DUP - Sample Duplicate

RPD - Relative Percent Difference

NC - Not Calculable.

SG - Silica Gel - Clean-Up

U - Indicates the compound was analyzed for, but not detected.

N-Nitrosodiphenylamine decomposes and cannot be separated from Diphenylamine using Method 8270. The result reported for each analyte is a combined concentration.

LABORATORIES

PASI-K	Pace Analytical Services - Kansas City
PASI-M	Pace Analytical Services - Minneapolis
PASI-MT	Pace Analytical Services - Montana

ANALYTE QUALIFIERS

D6	The relative percent difference (RPD) between the sample and sample duplicate exceeded laboratory control limits.
E	Analyte concentration exceeded the calibration range. The reported result is estimated.
M1	Matrix spike recovery exceeded QC limits. Batch accepted based on laboratory control sample (LCS) recovery.
M6	Matrix spike and Matrix spike duplicate recovery not evaluated against control limits due to sample dilution.
P8	Analyte was detected in the method blank. All associated samples had concentrations of at least ten times greater than the blank or were below the reporting limit.

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QUALITY CONTROL DATA CROSS REFERENCE TABLE

Project: Black Pine Mine
Pace Project No.: 10163246

Lab ID	Sample ID	QC Batch Method	QC Batch	Analytical Method	Analytical Batch
10163246001	**BP-RY-SS-02-00**	ASA 13-3.5.2.2	MPRP/27469	CLPICPAES	ICP/11638
10163246002	**BP-RY-SS-01-00**	ASA 13-3.5.2.2	MPRP/27469	CLPICPAES	ICP/11638
10163246003	**BP-RY-SS-03-00**	ASA 13-3.5.2.2	MPRP/27469	CLPICPAES	ICP/11638
10163246004	**BP-RY-SS-03-14**	ASA 13-3.5.2.2	MPRP/27469	CLPICPAES	ICP/11638
10163246005	**BP-RY-SS-02-02**	ASA 13-3.5.2.2	MPRP/27469	CLPICPAES	ICP/11638
10163246006	**BP-RY-SS-04-00**	ASA 13-3.5.2.2	MPRP/27469	CLPICPAES	ICP/11638
10163246007	**BP-RY-SS-04-02**	ASA 13-3.5.2.2	MPRP/27469	CLPICPAES	ICP/11638
10163246008	**BP-RY-SS-04-10**	ASA 13-3.5.2.2	MPRP/27469	CLPICPAES	ICP/11638
10163246009	**BP-RY-SS-05-00**	ASA 13-3.5.2.2	MPRP/27469	CLPICPAES	ICP/11638
10163246010	**BP-RY-SS-05-02**	ASA 13-3.5.2.2	MPRP/27469	CLPICPAES	ICP/11638
10163246001	**BP-RY-SS-02-00**	EPA 9081	ICP/14882	EPA 9081	ICP/12949
10163246002	**BP-RY-SS-01-00**	EPA 9081	ICP/14882	EPA 9081	ICP/12949
10163246003	**BP-RY-SS-03-00**	EPA 9081	ICP/14882	EPA 9081	ICP/12949
10163246004	**BP-RY-SS-03-14**	EPA 9081	ICP/14882	EPA 9081	ICP/12949
10163246005	**BP-RY-SS-02-02**	EPA 9081	ICP/14882	EPA 9081	ICP/12949
10163246006	**BP-RY-SS-04-00**	EPA 9081	ICP/14882	EPA 9081	ICP/12949
10163246007	**BP-RY-SS-04-02**	EPA 9081	ICP/14882	EPA 9081	ICP/12949
10163246008	**BP-RY-SS-04-10**	EPA 9081	ICP/14882	EPA 9081	ICP/12949
10163246009	**BP-RY-SS-05-00**	EPA 9081	ICP/14882	EPA 9081	ICP/12949
10163246010	**BP-RY-SS-05-02**	EPA 9081	ICP/14882	EPA 9081	ICP/12949
10163246001	**BP-RY-SS-02-00**	EPA 3050	MPRP/27163	EPA 6020	ICPM/11135
10163246002	**BP-RY-SS-01-00**	EPA 3050	MPRP/27163	EPA 6020	ICPM/11135
10163246003	**BP-RY-SS-03-00**	EPA 3050	MPRP/27163	EPA 6020	ICPM/11135
10163246004	**BP-RY-SS-03-14**	EPA 3050	MPRP/27163	EPA 6020	ICPM/11135
10163246005	**BP-RY-SS-02-02**	EPA 3050	MPRP/27163	EPA 6020	ICPM/11135
10163246006	**BP-RY-SS-04-00**	EPA 3050	MPRP/27163	EPA 6020	ICPM/11135
10163246007	**BP-RY-SS-04-02**	EPA 3050	MPRP/27163	EPA 6020	ICPM/11135
10163246008	**BP-RY-SS-04-10**	EPA 3050	MPRP/27163	EPA 6020	ICPM/11135
10163246009	**BP-RY-SS-05-00**	EPA 3050	MPRP/27163	EPA 6020	ICPM/11135
10163246010	**BP-RY-SS-05-02**	EPA 3050	MPRP/27163	EPA 6020	ICPM/11135
10163246001	**BP-RY-SS-02-00**	EPA 7471	MERP/5632	EPA 7471	MERC/6492
10163246002	**BP-RY-SS-01-00**	EPA 7471	MERP/5632	EPA 7471	MERC/6492
10163246003	**BP-RY-SS-03-00**	EPA 7471	MERP/5632	EPA 7471	MERC/6492
10163246004	**BP-RY-SS-03-14**	EPA 7471	MERP/5632	EPA 7471	MERC/6492
10163246005	**BP-RY-SS-02-02**	EPA 7471	MERP/5632	EPA 7471	MERC/6492
10163246006	**BP-RY-SS-04-00**	EPA 7471	MERP/5632	EPA 7471	MERC/6492
10163246007	**BP-RY-SS-04-02**	EPA 7471	MERP/5632	EPA 7471	MERC/6492
10163246008	**BP-RY-SS-04-10**	EPA 7471	MERP/5632	EPA 7471	MERC/6492
10163246009	**BP-RY-SS-05-00**	EPA 7471	MERP/5632	EPA 7471	MERC/6492
10163246010	**BP-RY-SS-05-02**	EPA 7471	MERP/5632	EPA 7471	MERC/6492
10163246001	**BP-RY-SS-02-00**	% Moisture	MPRP/27229		
10163246002	**BP-RY-SS-01-00**	% Moisture	MPRP/27256		
10163246003	**BP-RY-SS-03-00**	% Moisture	MPRP/27256		
10163246004	**BP-RY-SS-03-14**	% Moisture	MPRP/27256		
10163246005	**BP-RY-SS-02-02**	% Moisture	MPRP/27256		
10163246006	**BP-RY-SS-04-00**	% Moisture	MPRP/27256		

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QUALITY CONTROL DATA CROSS REFERENCE TABLE

Project: Black Pine Mine
Pace Project No.: 10163246

Lab ID	Sample ID	QC Batch Method	QC Batch	Analytical Method	Analytical Batch
10163246007	BP-RY-SS-04-02	% Moisture	MPRP/27256		
10163246008	BP-RY-SS-04-10	% Moisture	MPRP/27256		
10163246009	BP-RY-SS-05-00	% Moisture	MPRP/27256		
10163246010	BP-RY-SS-05-02	% Moisture	MPRP/27256		
10163246001	BP-RY-SS-02-00	ASA 33-3.2/EPA 353.2	MT/6442		
10163246002	BP-RY-SS-01-00	ASA 33-3.2/EPA 353.2	MT/6442		
10163246003	BP-RY-SS-03-00	ASA 33-3.2/EPA 353.2	MT/6442		
10163246004	BP-RY-SS-03-14	ASA 33-3.2/EPA 353.2	MT/6442		
10163246005	BP-RY-SS-02-02	ASA 33-3.2/EPA 353.2	MT/6442		
10163246006	BP-RY-SS-04-00	ASA 33-3.2/EPA 353.2	MT/6442		
10163246007	BP-RY-SS-04-02	ASA 33-3.2/EPA 353.2	MT/6442		
10163246008	BP-RY-SS-04-10	ASA 33-3.2/EPA 353.2	MT/6442		
10163246009	BP-RY-SS-05-00	ASA 33-3.2/EPA 353.2	MT/6442		
10163246010	BP-RY-SS-05-02	ASA 33-3.2/EPA 353.2	MT/6442		
10163246001	BP-RY-SS-02-00	ASTM D421	MT/6412		
10163246002	BP-RY-SS-01-00	ASTM D421	MT/6412		
10163246003	BP-RY-SS-03-00	ASTM D421	MT/6412		
10163246004	BP-RY-SS-03-14	ASTM D421	MT/6412		
10163246005	BP-RY-SS-02-02	ASTM D421	MT/6412		
10163246006	BP-RY-SS-04-00	ASTM D421	MT/6412		
10163246007	BP-RY-SS-04-02	ASTM D421	MT/6412		
10163246008	BP-RY-SS-04-10	ASTM D421	MT/6412		
10163246009	BP-RY-SS-05-00	ASTM D421	MT/6412		
10163246010	BP-RY-SS-05-02	ASTM D421	MT/6412		
10163246001	BP-RY-SS-02-00	ASA 29-3.5.2	MT/6438		
10163246002	BP-RY-SS-01-00	ASA 29-3.5.2	MT/6438		
10163246003	BP-RY-SS-03-00	ASA 29-3.5.2	MT/6438		
10163246004	BP-RY-SS-03-14	ASA 29-3.5.2	MT/6438		
10163246005	BP-RY-SS-02-02	ASA 29-3.5.2	MT/6438		
10163246006	BP-RY-SS-04-00	ASA 29-3.5.2	MT/6460		
10163246007	BP-RY-SS-04-02	ASA 29-3.5.2	MT/6438		
10163246008	BP-RY-SS-04-10	ASA 29-3.5.2	MT/6438		
10163246009	BP-RY-SS-05-00	ASA 29-3.5.2	MT/6438		
10163246010	BP-RY-SS-05-02	ASA 29-3.5.2	MT/6438		
10163246001	BP-RY-SS-02-00	ASA 10-3.2	MT/6426		
10163246002	BP-RY-SS-01-00	ASA 10-3.2	MT/6426		
10163246003	BP-RY-SS-03-00	ASA 10-3.2	MT/6426		
10163246004	BP-RY-SS-03-14	ASA 10-3.2	MT/6426		
10163246005	BP-RY-SS-02-02	ASA 10-3.2	MT/6426		
10163246006	BP-RY-SS-04-00	ASA 10-3.2	MT/6426		
10163246007	BP-RY-SS-04-02	ASA 10-3.2	MT/6426		
10163246008	BP-RY-SS-04-10	ASA 10-3.2	MT/6426		
10163246009	BP-RY-SS-05-00	ASA 10-3.2	MT/6426		
10163246010	BP-RY-SS-05-02	ASA 10-3.2	MT/6426		
10163246001	BP-RY-SS-02-00	ASA 24-5.4/SM4500	MT/6443		

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QUALITY CONTROL DATA CROSS REFERENCE TABLE

Project: Black Pine Mine
Pace Project No.: 10163246

Lab ID	Sample ID	QC Batch Method	QC Batch	Analytical Method	Analytical Batch
10163246002	**BP-RY-SS-01-00**	ASA 24-5.4/SM4500	MT/6443		
10163246003	**BP-RY-SS-03-00**	ASA 24-5.4/SM4500	MT/6443		
10163246004	**BP-RY-SS-03-14**	ASA 24-5.4/SM4500	MT/6443		
10163246005	**BP-RY-SS-02-02**	ASA 24-5.4/SM4500	MT/6443		
10163246006	**BP-RY-SS-04-00**	ASA 24-5.4/SM4500	MT/6443		
10163246007	**BP-RY-SS-04-02**	ASA 24-5.4/SM4500	MT/6443		
10163246008	**BP-RY-SS-04-10**	ASA 24-5.4/SM4500	MT/6443		
10163246009	**BP-RY-SS-05-00**	ASA 24-5.4/SM4500	MT/6443		
10163246010	**BP-RY-SS-05-02**	ASA 24-5.4/SM4500	MT/6443		
10163246001	**BP-RY-SS-02-00**	Modified Sobek 3.2	MT/6480		
10163246002	**BP-RY-SS-01-00**	Modified Sobek 3.2	MT/6480		
10163246003	**BP-RY-SS-03-00**	Modified Sobek 3.2	MT/6480		
10163246004	**BP-RY-SS-03-14**	Modified Sobek 3.2	MT/6480		
10163246005	**BP-RY-SS-02-02**	Modified Sobek 3.2	MT/6480		
10163246006	**BP-RY-SS-04-00**	Modified Sobek 3.2	MT/6480		
10163246007	**BP-RY-SS-04-02**	Modified Sobek 3.2	MT/6480		
10163246008	**BP-RY-SS-04-10**	Modified Sobek 3.2	MT/6480		
10163246009	**BP-RY-SS-05-00**	Modified Sobek 3.2	MT/6480		
10163246010	**BP-RY-SS-05-02**	Modified Sobek 3.2	MT/6480		
10163246001	**BP-RY-SS-02-00**	Modified Sobek 3.2	MT/6452		
10163246002	**BP-RY-SS-01-00**	Modified Sobek 3.2	MT/6452		
10163246003	**BP-RY-SS-03-00**	Modified Sobek 3.2	MT/6452		
10163246004	**BP-RY-SS-03-14**	Modified Sobek 3.2	MT/6452		
10163246005	**BP-RY-SS-02-02**	Modified Sobek 3.2	MT/6452		
10163246006	**BP-RY-SS-04-00**	Modified Sobek 3.2	MT/6452		
10163246007	**BP-RY-SS-04-02**	Modified Sobek 3.2	MT/6452		
10163246008	**BP-RY-SS-04-10**	Modified Sobek 3.2	MT/6452		
10163246009	**BP-RY-SS-05-00**	Modified Sobek 3.2	MT/6452		
10163246010	**BP-RY-SS-05-02**	Modified Sobek 3.2	MT/6452		
10163246001	**BP-RY-SS-02-00**	Modified Sobek 3.2	MT/6499		
10163246002	**BP-RY-SS-01-00**	Modified Sobek 3.2	MT/6499		
10163246003	**BP-RY-SS-03-00**	Modified Sobek 3.2	MT/6499		
10163246004	**BP-RY-SS-03-14**	Modified Sobek 3.2	MT/6499		
10163246005	**BP-RY-SS-02-02**	Modified Sobek 3.2	MT/6499		
10163246006	**BP-RY-SS-04-00**	Modified Sobek 3.2	MT/6499		
10163246007	**BP-RY-SS-04-02**	Modified Sobek 3.2	MT/6499		
10163246008	**BP-RY-SS-04-10**	Modified Sobek 3.2	MT/6499		
10163246009	**BP-RY-SS-05-00**	Modified Sobek 3.2	MT/6499		
10163246010	**BP-RY-SS-05-02**	Modified Sobek 3.2	MT/6499		
10163246001	**BP-RY-SS-02-00**	Modified Sobek 3.2	MT/6481		
10163246002	**BP-RY-SS-01-00**	Modified Sobek 3.2	MT/6481		
10163246003	**BP-RY-SS-03-00**	Modified Sobek 3.2	MT/6481		
10163246004	**BP-RY-SS-03-14**	Modified Sobek 3.2	MT/6481		
10163246005	**BP-RY-SS-02-02**	Modified Sobek 3.2	MT/6481		
10163246006	**BP-RY-SS-04-00**	Modified Sobek 3.2	MT/6481		
10163246007	**BP-RY-SS-04-02**	Modified Sobek 3.2	MT/6481		
10163246008	**BP-RY-SS-04-10**	Modified Sobek 3.2	MT/6481		

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(406)254-7226

QUALITY CONTROL DATA CROSS REFERENCE TABLE

Project: Black Pine Mine
Pace Project No.: 10163246

Lab ID	Sample ID	QC Batch Method	QC Batch	Analytical Method	Analytical Batch
10163246009	**BP-RY-SS-05-00**	Modified Sobek 3.2	MT/6481		
10163246010	**BP-RY-SS-05-02**	Modified Sobek 3.2	MT/6481		
10163246001	**BP-RY-SS-02-00**	ASA 10-3.3	MT/6547		
10163246002	**BP-RY-SS-01-00**	ASA 10-3.3	MT/6547		
10163246003	**BP-RY-SS-03-00**	ASA 10-3.3	MT/6547		
10163246004	**BP-RY-SS-03-14**	ASA 10-3.3	MT/6547		
10163246005	**BP-RY-SS-02-02**	ASA 10-3.3	MT/6547		
10163246006	**BP-RY-SS-04-00**	ASA 10-3.3	MT/6547		
10163246007	**BP-RY-SS-04-02**	ASA 10-3.3	MT/6547		
10163246008	**BP-RY-SS-04-10**	ASA 10-3.3	MT/6547		
10163246009	**BP-RY-SS-05-00**	ASA 10-3.3	MT/6547		
10163246010	**BP-RY-SS-05-02**	ASA 10-3.3	MT/6547		

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CHAIN-OF-CUSTODY / Analytical Request Document

Pace Analytical® www.pacelabs.com

The Chain-of-Custody is a LEGAL DOCUMENT. All relevant fields must be completed accurately.

Page: 1 of 1

1429996

Section A Required Client Information:

Company: Herrera
Address:
Email To: Khouck@herrerainc.com
Phone: Fax:
Requested Due Date/TAT:

Section B Required Project Information:

Report To: Kevin Houck
Copy To:
Purchase Order No.:
Project Name: Black Pine Mine
Project Number:

Section C Invoice Information:

Attention:
Company Name: DEQ
Address:
Pace Quote Reference:
Pace Project Manager:
Pace Profile #:

REGULATORY AGENCY

☐ NPDES ☐ GROUND WATER ☐ DRINKING WATER
☐ UST ☐ RCRA ☐ OTHER

Site Location STATE: MT

Section D Required Client Information

SAMPLE ID (A-Z, 0-9 / ,-) Sample IDs MUST BE UNIQUE

Matrix Codes — MATRIX / CODE: Drinking Water DW; Water WT; Waste Water WW; Product P; Soil/Solid SL; Oil OL; Wipe WP; Air AR; Tissue TS; Other OT

Requested Analysis Filtered (Y/N)

ITEM #	SAMPLE ID	MATRIX CODE (see valid codes to left)	SAMPLE TYPE (G=GRAB C=COMP)	COLLECTED: COMPOSITE START DATE	COMPOSITE START TIME	COMPOSITE END/GRAB DATE	COMPOSITE END/GRAB TIME	SAMPLE TEMP AT COLLECTION	# OF CONTAINERS	Preservatives: Unpreserved	H_2SO_4	HNO_3	HCl	NaOH	$Na_2S_2O_3$	Methanol	Other	Analysis Test Y/N	Total Met **	Agri *	Residual Chlorine (Y/N)	Pace Project No./ Lab I.D.
1	BP-RY-SS-02-00	SL	G			7/12/11	0850		2	X									X	X		001
2	BP-RY-SS-01-00	SL	G			7/12/11	0918		2	X									X	X		002
3	BP-RY-SS-03-60	SL	G			7/12/11	1025		2	X									X	X		003
4	BP-RY-SS-03-14	SL	G			7/12/11	1028		2	X									X	X		004
5	BP-RY-SS-02-02	SL	G			7/12/11	0855		2	X									X	X		005
6	BP-RY-SS-04-00	SL	G				1128		2	X									X	X		006
7	BP-RY-SS-04-02	SL	G				1130		2	X									X	X		007
8	BP-RY-SS-04-10	SL	G				1133		2	X									X	X		008
9	BP-RY-SS-05-00	SL	G			7/12/11	1228		2	X									X	X		009
10	BP-RY-SS-05-02	SL	G			7/12/11	1230		2	X									X	X		010
11																		7/12/11				
12																						

* Agri = pH, CEC, conductivity, nitrogen, phosphorous, potassium, OM, lime w/ buff. req. 16163246

ADDITIONAL COMMENTS	RELINQUISHED BY / AFFILIATION	DATE	TIME	ACCEPTED BY / AFFILIATION	DATE	TIME	SAMPLE CONDITIONS			
** = Total Metals = (recoverable) Sb, As, Ba, Cd, Cr, Co, Cu, Fe, Pb, Mn, Hg, Ni, Zn	Cullen/Herrera	7/12/11	1340	Blake Horner	7/12/11	1:40				
	Fed Ex (G)	7/13/11	0900	Kim Pocha/Pace	7/13/11	0900	1H	Y	Y	Y

ORIGINAL

SAMPLER NAME AND SIGNATURE

PRINT Name of SAMPLER:

SIGNATURE of SAMPLER: DATE Signed (MM/DD/YY):

Temp in °C	Received on Ice (Y/N)	Custody Sealed Cooler (Y/N)	Samples Intact (Y/N)

*Important Note: By signing this form you are accepting Pace's NET 30 day payment terms and agreeing to late charges of 1.5% per month for any invoices not paid within 30 days.

F-ALL-Q-020rev.07, 15-May-2007

Sample Condition Upon Receipt

Pace Analytical

Client Name: Black Pine Mine Project # 10163246

(61)

Courier: ☒ Fed Ex ☐ UPS ☐ USPS ☐ Client ☐ Commercial ☐ Pace Other _____

Tracking #: 0457557 150342274

Custody Seal on Cooler/Box Present: ☒ yes ☐ no Seals intact: ☒ yes ☐ no

Packing Material: ☐ Bubble Wrap ☒ Bubble Bags ☐ None ☐ Other _____ Temp Blank: Yes X No _____

Thermometer Used 1383045 or 135 Type of Ice: (Wet) Blue None ☒ Samples on ice, cooling process has begun

Cooler Temperature 1.4 Biological Tissue is Frozen: Yes No

Temp should be above freezing to 6°C

Date and Initials of person examining contents: RW 7/13/11

Comments:

Chain of Custody Present:	☒Yes ☐No ☐N/A	1.
Chain of Custody Filled Out:	☒Yes ☐No ☐N/A	2.
Chain of Custody Relinquished:	☒Yes ☐No ☐N/A	3.
Sampler Name & Signature on COC:	☐Yes ☒No ☐N/A	4.
Samples Arrived within Hold Time:	☒Yes ☐No ☐N/A	5.
Short Hold Time Analysis (<72hr):	☐Yes ☒No ☐N/A	6.
Rush Turn Around Time Requested:	☐Yes ☒No ☐N/A	7.
Sufficient Volume:	☒Yes ☐No ☐N/A	8.
Correct Containers Used:	☒Yes ☐No ☐N/A	9. Also PB used
-Pace Containers Used:	☒Yes ☐No ☐N/A	
Containers Intact:	☒Yes ☐No ☐N/A	10.
Filtered volume received for Dissolved tests	☐Yes ☐No ☒N/A	11.
Sample Labels match COC:	☒Yes ☐No ☐N/A	12.
-Includes date/time/ID/Analysis Matrix: SL		
All containers needing acid/base preservation have been checked. Noncompliance are noted in 13.	☐Yes ☐No ☒N/A	13. ☐ HNO3 ☐ H2SO4 ☐ NaOH ☐ HCl Samp #
All containers needing preservation are found to be in compliance with EPA recommendation.	☐Yes ☐No ☒N/A	
Exceptions: VOA,Coliform, TOC, Oil and Grease, WI-DRO (water)	☐Yes ☑No	Initial when completed / Lot # of added preservative
Samples checked for dechlorination:	☐Yes ☐No ☒N/A	14.
Headspace in VOA Vials (>6mm):	☐Yes ☐No ☒N/A	15.
Trip Blank Present:	☐Yes ☒No ☐N/A	16.
Trip Blank Custody Seals Present	☐Yes ☐No ☒N/A	
Pace Trip Blank Lot # (if purchased): NA		

Client Notification/ Resolution: Field Data Required? Y / N

Person Contacted: _____ Date/Time: _____

Comments/ Resolution: _____

Project Manager Review: _____ **Date:** 7/14/11

Note: Whenever there is a discrepancy affecting North Carolina compliance samples, a copy of this form will be sent to the North Carolina DEHNR Certification Office (i.e out of hold, incorrect preservative, out of temp, incorrect containers)

Pace Analytical Services, Inc.
602 S 25th Street
Billings, MT 591014549
(406)254-7226

August 04, 2011

Kevin Houck
Herrera Environmental Consultants
101 East Broadway, Suite 610
Missoula, MT 59802

RE: Project: BlackPine Mine
Pace Project No.: 10163437

Dear Kevin Houck:
Enclosed are the analytical results for sample(s) received by the laboratory on July 15, 2011. The results relate only to the samples included in this report.

If you have any questions concerning this report, please feel free to contact me.

Sincerely,

Sally Heinje

sally.heinje@pacelabs.com
Project Manager

Enclosures

cc: Devin Clary, Montana Dept. of Environmental Quality
Mark Donner, Trihydro

REPORT OF LABORATORY ANALYSIS

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CERTIFICATIONS

Project: BlackPine Mine
Pace Project No.: 10163437

Minnesota Certification IDs

1700 Elm Street SE Suite 200, Minneapolis, MN 55414
A2LA Certification #: 2926.01
Alaska Certification #: UST-078
Alaska Certification #MN00064
Arizona Certification #: AZ-0014
Arkansas Certification #: 88-0680
California Certification #: 01155CA
EPA Region 8 Certification #: Pace
Florida/NELAP Certification #: E87605
Georgia Certification #: 959
Idaho Certification #: MN00064
Illinois Certification #: 200011
Iowa Certification #: 368
Kansas Certification #: E-10167
Louisiana Certification #: 03086
Louisiana Certification #: LA080009
Maine Certification #: 2007029
Maryland Certification #: 322
Michigan DEQ Certification #: 9909
Minnesota Certification #: 027-053-137
Mississippi Certification #: Pace
Montana Certification #: MT CERT0092
Nevada Certification #: MN_00064
Nebraska Certification #: Pace
New Jersey Certification #: MN-002
New Mexico Certification #: Pace
New York Certification #: 11647
North Carolina Certification #: 530
North Dakota Certification #: R-036
North Dakota Certification #: R-036A
Ohio VAP Certification #: CL101
Oklahoma Certification #: D9921
Oklahoma Certification #: 9507
Oregon Certification #: MN200001
Pennsylvania Certification #: 68-00563
Puerto Rico Certification
Tennessee Certification #: 02818
Texas Certification #: T104704192
Washington Certification #: C754
Wisconsin Certification #: 999407970

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SAMPLE SUMMARY

Project: BlackPine Mine
Pace Project No.: 10163437

Lab ID	Sample ID	Matrix	Date Collected	Date Received
10163437001	CML-SD-45	Solid	07/12/11 09:15	07/15/11 09:25
10163437002	CML-SD-43	Solid	07/12/11 09:30	07/15/11 09:25
10163437003	CML-SD-40	Solid	07/12/11 09:40	07/15/11 09:25
10163437004	CML-SD-37	Solid	07/12/11 09:45	07/15/11 09:25
10163437005	CML-SD-36	Solid	07/12/11 09:55	07/15/11 09:25
10163437006	CML-SD-34	Solid	07/12/11 10:10	07/15/11 09:25
10163437007	CML-SD-35	Solid	07/12/11 10:15	07/15/11 09:25
10163437008	CML-SD-38	Solid	07/12/11 10:25	07/15/11 09:25
10163437009	CML-SD-41	Solid	07/12/11 10:35	07/15/11 09:25
10163437010	CML-SD-44	Solid	07/12/11 10:40	07/15/11 09:25
10163437011	CML-SD-46	Solid	07/12/11 10:45	07/15/11 09:25
10163437012	CML-SD-33-00	Solid	07/12/11 11:45	07/15/11 09:25
10163437013	CML-SD-33-01	Solid	07/12/11 11:55	07/15/11 09:25
10163437014	CML-SD-32-00	Solid	07/12/11 12:10	07/15/11 09:25
10163437015	CML-SD-31-00	Solid	07/12/11 12:20	07/15/11 09:25
10163437016	CML-SD-31-02	Solid	07/12/11 12:35	07/15/11 09:25
10163437017	CML-SD-29-00	Solid	07/12/11 12:50	07/15/11 09:25
10163437018	CML-SD-28-00	Solid	07/12/11 12:55	07/15/11 09:25
10163437019	CML-SD-27-00	Solid	07/12/11 14:20	07/15/11 09:25
10163437020	CML-SD-24-00	Solid	07/12/11 14:30	07/15/11 09:25
10163437021	CML-SD-24-01	Solid	07/12/11 14:35	07/15/11 09:25
10163437022	CML-SD-25-00	Solid	07/12/11 14:45	07/15/11 09:25
10163437023	CML-SD-26-00	Solid	07/12/11 14:50	07/15/11 09:25
10163437024	CML-SD-21-00	Solid	07/12/11 15:00	07/15/11 09:25
10163437025	CML-SD-20-00	Solid	07/12/11 15:05	07/15/11 09:25
10163437026	CML-SD-20-02	Solid	07/12/11 15:50	07/15/11 09:25
10163437027	CML-SD-42-00	Solid	07/13/11 08:15	07/15/11 09:25
10163437028	CML-SD-42-02	Solid	07/13/11 08:45	07/15/11 09:25
10163437029	CML-SD-39-00	Solid	07/13/11 09:00	07/15/11 09:25
10163437030	CML-SD-30-00	Solid	07/13/11 09:20	07/15/11 09:25
10163437031	CML-SD-22-00	Solid	07/13/11 09:35	07/15/11 09:25
10163437032	CML-SD-23-00	Solid	07/13/11 09:45	07/15/11 09:25
10163437033	CML-SD-23-02	Solid	07/13/11 09:50	07/15/11 09:25
10163437034	CML-SD-19-00	Solid	07/13/11 10:10	07/15/11 09:25
10163437035	CML-SD-19-02	Solid	07/13/11 10:15	07/15/11 09:25
10163437036	CML-SD-18-00	Solid	07/13/11 10:20	07/15/11 09:25

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SAMPLE ANALYTE COUNT

Project: BlackPine Mine
Pace Project No.: 10163437

Lab ID	Sample ID	Method	Analysts	Analytes Reported	Laboratory
10163437001	**CML-SD-45**	EPA 6010	IP	12	PASI-M
		EPA 7471	TEM	1	PASI-M
		% Moisture	JDL	1	PASI-M
10163437002	**CML-SD-43**	EPA 6010	IP	12	PASI-M
		EPA 7471	TEM	1	PASI-M
		% Moisture	JDL	1	PASI-M
10163437003	**CML-SD-40**	EPA 6010	IP	12	PASI-M
		EPA 7471	TEM	1	PASI-M
		% Moisture	JDL	1	PASI-M
10163437004	**CML-SD-37**	EPA 6010	IP	12	PASI-M
		EPA 7471	TEM	1	PASI-M
		% Moisture	JDL	1	PASI-M
10163437005	**CML-SD-36**	EPA 6010	IP	12	PASI-M
		EPA 7471	TEM	1	PASI-M
		% Moisture	JDL	1	PASI-M
10163437006	**CML-SD-34**	EPA 6010	IP	12	PASI-M
		EPA 7471	TEM	1	PASI-M
		% Moisture	JDL	1	PASI-M
10163437007	**CML-SD-35**	EPA 6010	IP	12	PASI-M
		EPA 7471	TEM	1	PASI-M
		% Moisture	JDL	1	PASI-M
10163437008	**CML-SD-38**	EPA 6010	IP	12	PASI-M
		EPA 7471	TEM	1	PASI-M
		% Moisture	JDL	1	PASI-M
10163437009	**CML-SD-41**	EPA 6010	IP	12	PASI-M
		EPA 7471	TEM	1	PASI-M
		% Moisture	JDL	1	PASI-M
10163437010	**CML-SD-44**	EPA 6010	IP	12	PASI-M
		EPA 7471	TEM	1	PASI-M
		% Moisture	JDL	1	PASI-M
10163437011	**CML-SD-46**	EPA 6010	IP	12	PASI-M
		EPA 7471	TEM	1	PASI-M
		% Moisture	JDL	1	PASI-M
10163437012	**CML-SD-33-00**	EPA 6010	IP	12	PASI-M
		EPA 7471	TEM	1	PASI-M
		% Moisture	JDL	1	PASI-M
10163437013	**CML-SD-33-01**	EPA 6010	IP	12	PASI-M

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SAMPLE ANALYTE COUNT

Project: BlackPine Mine
Pace Project No.: 10163437

Lab ID	Sample ID	Method	Analysts	Analytes Reported	Laboratory
		EPA 7471	TEM	1	PASI-M
		% Moisture	JDL	1	PASI-M
10163437014	**CML-SD-32-00**	EPA 6010	IP	12	PASI-M
		EPA 7471	TEM	1	PASI-M
		% Moisture	JDL	1	PASI-M
10163437015	**CML-SD-31-00**	EPA 6010	IP	12	PASI-M
		EPA 7471	TEM	1	PASI-M
		% Moisture	JDL	1	PASI-M
10163437016	**CML-SD-31-02**	EPA 6010	IP	12	PASI-M
		EPA 7471	TEM	1	PASI-M
		% Moisture	JDL	1	PASI-M
10163437017	**CML-SD-29-00**	EPA 6010	IP	12	PASI-M
		EPA 7471	TEM	1	PASI-M
		% Moisture	JDL	1	PASI-M
10163437018	**CML-SD-28-00**	EPA 6010	IP	12	PASI-M
		EPA 7471	TEM	1	PASI-M
		% Moisture	JDL	1	PASI-M
10163437019	**CML-SD-27-00**	EPA 6010	IP	12	PASI-M
		EPA 7471	TEM	1	PASI-M
		% Moisture	JDL	1	PASI-M
10163437020	**CML-SD-24-00**	EPA 6010	IP	12	PASI-M
		EPA 7471	TEM	1	PASI-M
		% Moisture	JDL	1	PASI-M
10163437021	**CML-SD-24-01**	EPA 6010	IP	12	PASI-M
		EPA 7471	TEM	1	PASI-M
		% Moisture	JDL	1	PASI-M
10163437022	**CML-SD-25-00**	EPA 6010	IP	12	PASI-M
		EPA 7471	TEM	1	PASI-M
		% Moisture	JDL	1	PASI-M
10163437023	**CML-SD-26-00**	EPA 6010	IP	12	PASI-M
		EPA 7471	TEM	1	PASI-M
		% Moisture	JDL	1	PASI-M
10163437024	**CML-SD-21-00**	EPA 6010	IP	12	PASI-M
		EPA 7471	TEM	1	PASI-M
		% Moisture	JDL	1	PASI-M
10163437025	**CML-SD-20-00**	EPA 6010	IP	12	PASI-M
		EPA 7471	TEM	1	PASI-M

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SAMPLE ANALYTE COUNT

Project: BlackPine Mine
Pace Project No.: 10163437

Lab ID	Sample ID	Method	Analysts	Analytes Reported	Laboratory
		% Moisture	JDL	1	PASI-M
10163437026	**CML-SD-20-02**	EPA 6010	IP	12	PASI-M
		EPA 7471	TEM	1	PASI-M
		% Moisture	JDL	1	PASI-M
10163437027	**CML-SD-42-00**	EPA 6010	IP	12	PASI-M
		EPA 7471	TEM	1	PASI-M
		% Moisture	JDL	1	PASI-M
10163437028	**CML-SD-42-02**	EPA 6010	IP	12	PASI-M
		EPA 7471	TEM	1	PASI-M
		% Moisture	JDL	1	PASI-M
10163437029	**CML-SD-39-00**	EPA 6010	IP	12	PASI-M
		EPA 7471	TEM	1	PASI-M
		% Moisture	JDL	1	PASI-M
10163437030	**CML-SD-30-00**	EPA 6010	IP	12	PASI-M
		EPA 7471	TEM	1	PASI-M
		% Moisture	JDL	1	PASI-M
10163437031	**CML-SD-22-00**	EPA 6010	IP	12	PASI-M
		EPA 7471	TEM	1	PASI-M
		% Moisture	JDL	1	PASI-M
10163437032	**CML-SD-23-00**	EPA 6010	IP	12	PASI-M
		EPA 7471	TEM	1	PASI-M
		% Moisture	JDL	1	PASI-M
10163437033	**CML-SD-23-02**	EPA 6010	IP	12	PASI-M
		EPA 7471	TEM	1	PASI-M
		% Moisture	JDL	1	PASI-M
10163437034	**CML-SD-19-00**	EPA 6010	IP	12	PASI-M
		EPA 7471	TEM	1	PASI-M
		% Moisture	JDL	1	PASI-M
10163437035	**CML-SD-19-02**	EPA 6010	IP	12	PASI-M
		EPA 7471	TEM	1	PASI-M
		% Moisture	JDL	1	PASI-M
10163437036	**CML-SD-18-00**	EPA 6010	IP	12	PASI-M
		EPA 7471	TEM	1	PASI-M
		% Moisture	JDL	1	PASI-M

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PROJECT NARRATIVE

Project: BlackPine Mine
Pace Project No.: 10163437

Method: **EPA 6010**
Description: 6010 MET ICP
Client: Montana Dept. of Environmental Quality
Date: August 04, 2011

General Information:
36 samples were analyzed for EPA 6010. All samples were received in acceptable condition with any exceptions noted below.

Hold Time:
The samples were analyzed within the method required hold times with any exceptions noted below.

Sample Preparation:
The samples were prepared in accordance with EPA 3050 with any exceptions noted below.

Initial Calibrations (including MS Tune as applicable):
All criteria were within method requirements with any exceptions noted below.

Continuing Calibration:
All criteria were within method requirements with any exceptions noted below.

Method Blank:
All analytes were below the report limit in the method blank with any exceptions noted below.

Laboratory Control Spike:
All laboratory control spike compounds were within QC limits with any exceptions noted below.

Matrix Spikes:
All percent recoveries and relative percent differences (RPDs) were within acceptance criteria with any exceptions noted below.

QC Batch: MPRP/27174

A matrix spike and matrix spike duplicate (MS/MSD) were performed on the following sample(s): 10163437001,10163437020

M1: Matrix spike recovery exceeded QC limits. Batch accepted based on laboratory control sample (LCS) recovery.

- MS (Lab ID: 1014890)
  - Antimony
  - Barium
  - Lead
  - Manganese
  - Zinc
- MS (Lab ID: 1014892)
  - Antimony
  - Barium
  - Copper
  - Lead
  - Zinc
- MSD (Lab ID: 1014891)
  - Antimony
  - Barium
  - Manganese

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PROJECT NARRATIVE

Project: BlackPine Mine
Pace Project No.: 10163437

Method: **EPA 6010**
Description: 6010 MET ICP
Client: Montana Dept. of Environmental Quality
Date: August 04, 2011

QC Batch: MPRP/27174

A matrix spike and matrix spike duplicate (MS/MSD) were performed on the following sample(s): 10163437001,10163437020

P6: Matrix spike recovery was outside laboratory control limits due to a parent sample concentration notably higher than the spike level.

- MS (Lab ID: 1014890)
  - Iron
- MS (Lab ID: 1014892)
  - Iron
- MSD (Lab ID: 1014891)
  - Iron

QC Batch: MPRP/27175

A matrix spike and matrix spike duplicate (MS/MSD) were performed on the following sample(s): 10163437021,10163437036

M1: Matrix spike recovery exceeded QC limits. Batch accepted based on laboratory control sample (LCS) recovery.

- MS (Lab ID: 1014895)
  - Antimony
  - Barium
  - Copper
- MS (Lab ID: 1014897)
  - Arsenic
  - Barium
  - Copper
  - Lead
  - Manganese
  - Zinc
- MSD (Lab ID: 1014896)
  - Antimony
  - Barium
  - Lead
  - Manganese
  - Zinc

P6: Matrix spike recovery was outside laboratory control limits due to a parent sample concentration notably higher than the spike level.

- MS (Lab ID: 1014895)
  - Iron
  - Manganese
- MS (Lab ID: 1014897)
  - Iron

Duplicate Sample:
All duplicate sample results were within method acceptance criteria with any exceptions noted below.

Additional Comments:

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PROJECT NARRATIVE

Project: BlackPine Mine
Pace Project No.: 10163437

Method: **EPA 6010**
Description: 6010 MET ICP
Client: Montana Dept. of Environmental Quality
Date: August 04, 2011

Analyte Comments:

QC Batch: MPRP/27174

- CML-SD-24-00 (Lab ID: 10163437020)
  - Iron
- CML-SD-27-00 (Lab ID: 10163437019)
  - Iron
- CML-SD-28-00 (Lab ID: 10163437018)
  - Iron
- CML-SD-29-00 (Lab ID: 10163437017)
  - Iron
- CML-SD-31-00 (Lab ID: 10163437015)
  - Iron
- CML-SD-31-02 (Lab ID: 10163437016)
  - Iron
- CML-SD-32-00 (Lab ID: 10163437014)
  - Iron
- CML-SD-33-00 (Lab ID: 10163437012)
  - Iron
- CML-SD-33-01 (Lab ID: 10163437013)
  - Iron
- CML-SD-34 (Lab ID: 10163437006)
  - Iron
- CML-SD-35 (Lab ID: 10163437007)
  - Iron
- CML-SD-36 (Lab ID: 10163437005)
  - Iron
- CML-SD-37 (Lab ID: 10163437004)
  - Iron
- CML-SD-38 (Lab ID: 10163437008)
  - Iron
- CML-SD-40 (Lab ID: 10163437003)
  - Iron
- CML-SD-41 (Lab ID: 10163437009)
  - Iron
- CML-SD-43 (Lab ID: 10163437002)
  - Iron
- CML-SD-44 (Lab ID: 10163437010)
  - Iron
- CML-SD-45 (Lab ID: 10163437001)
  - Iron
- CML-SD-46 (Lab ID: 10163437011)
  - Iron

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PROJECT NARRATIVE

Project: BlackPine Mine
Pace Project No.: 10163437

Method: **EPA 6010**
Description: 6010 MET ICP
Client: Montana Dept. of Environmental Quality
Date: August 04, 2011

Analyte Comments:

QC Batch: MPRP/27175

- CML-SD-18-00 (Lab ID: 10163437036)
  - Iron
- CML-SD-19-00 (Lab ID: 10163437034)
  - Iron
- CML-SD-19-02 (Lab ID: 10163437035)
  - Iron
- CML-SD-20-00 (Lab ID: 10163437025)
  - Iron
- CML-SD-20-02 (Lab ID: 10163437026)
  - Iron
- CML-SD-21-00 (Lab ID: 10163437024)
  - Iron
- CML-SD-22-00 (Lab ID: 10163437031)
  - Iron
- CML-SD-23-00 (Lab ID: 10163437032)
  - Iron
- CML-SD-23-02 (Lab ID: 10163437033)
  - Iron
- CML-SD-24-01 (Lab ID: 10163437021)
  - Iron
- CML-SD-25-00 (Lab ID: 10163437022)
  - Iron
- CML-SD-26-00 (Lab ID: 10163437023)
  - Iron
- CML-SD-30-00 (Lab ID: 10163437030)
  - Iron
- CML-SD-39-00 (Lab ID: 10163437029)
  - Iron
- CML-SD-42-00 (Lab ID: 10163437027)
  - Iron
- CML-SD-42-02 (Lab ID: 10163437028)
  - Iron

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PROJECT NARRATIVE

Project: BlackPine Mine
Pace Project No.: 10163437

Method: **EPA 7471**
Description: 7471 Mercury
Client: Montana Dept. of Environmental Quality
Date: August 04, 2011

General Information:
36 samples were analyzed for EPA 7471. All samples were received in acceptable condition with any exceptions noted below.

Hold Time:
The samples were analyzed within the method required hold times with any exceptions noted below.

Sample Preparation:
The samples were prepared in accordance with EPA 7471 with any exceptions noted below.

Initial Calibrations (including MS Tune as applicable):
All criteria were within method requirements with any exceptions noted below.

Continuing Calibration:
All criteria were within method requirements with any exceptions noted below.

Method Blank:
All analytes were below the report limit in the method blank with any exceptions noted below.

Laboratory Control Spike:
All laboratory control spike compounds were within QC limits with any exceptions noted below.

Matrix Spikes:
All percent recoveries and relative percent differences (RPDs) were within acceptance criteria with any exceptions noted below.

QC Batch: MERP/5638

A matrix spike and matrix spike duplicate (MS/MSD) were performed on the following sample(s): 10163437021,10163437036

M6: Matrix spike and Matrix spike duplicate recovery not evaluated against control limits due to sample dilution.

- MS (Lab ID: 1015395)
  - Mercury
- MS (Lab ID: 1024027)
  - Mercury
- MSD (Lab ID: 1024028)
  - Mercury

QC Batch: MERP/5637

A matrix spike and matrix spike duplicate (MS/MSD) were performed on the following sample(s): 10163437001,10163437020

M6: Matrix spike and Matrix spike duplicate recovery not evaluated against control limits due to sample dilution.

- MS (Lab ID: 1015386)
  - Mercury
- MS (Lab ID: 1015388)
  - Mercury
- MSD (Lab ID: 1015387)
  - Mercury

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PROJECT NARRATIVE

Project: BlackPine Mine
Pace Project No.: 10163437

Method: **EPA 7471**
Description: 7471 Mercury
Client: Montana Dept. of Environmental Quality
Date: August 04, 2011

Duplicate Sample:
All duplicate sample results were within method acceptance criteria with any exceptions noted below.

Additional Comments:

This data package has been reviewed for quality and completeness and is approved for release.

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ANALYTICAL RESULTS

Project: BlackPine Mine
Pace Project No.: 10163437

Sample: CML-SD-45 **Lab ID: 10163437001** Collected: 07/12/11 09:15 Received: 07/15/11 09:25 Matrix: Solid

Results reported on a "dry-weight" basis

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
6010 MET ICP	Analytical Method: EPA 6010 Preparation Method: EPA 3050							
Antimony	**2.8**	mg/kg	2.5	5	07/29/11 13:53	08/01/11 17:31	7440-36-0	M1
Arsenic	**7.8**	mg/kg	2.5	5	07/29/11 13:53	08/01/11 17:31	7440-38-2	
Barium	**285**	mg/kg	2.5	5	07/29/11 13:53	08/01/11 17:31	7440-39-3	M1
Cadmium	**1.1**	mg/kg	0.25	5	07/29/11 13:53	08/01/11 17:31	7440-43-9	
Chromium	**8.4**	mg/kg	2.5	5	07/29/11 13:53	08/01/11 17:31	7440-47-3	
Copper	**42.5**	mg/kg	2.5	5	07/29/11 13:53	08/01/11 17:31	7440-50-8	
Iron	**9690**	mg/kg	12.7	5	07/29/11 13:53	08/01/11 17:31	7439-89-6	P6
Lead	**37.5**	mg/kg	1.5	5	07/29/11 13:53	08/01/11 17:31	7439-92-1	M1
Manganese	**739**	mg/kg	1.3	5	07/29/11 13:53	08/01/11 17:31	7439-96-5	M1
Nickel	**11.0**	mg/kg	5.1	5	07/29/11 13:53	08/01/11 17:31	7440-02-0	
Silver	**<2.5**	mg/kg	2.5	5	07/29/11 13:53	08/01/11 17:31	7440-22-4	
Zinc	**78.3**	mg/kg	5.1	5	07/29/11 13:53	08/01/11 17:31	7440-66-6	M1
7471 Mercury	Analytical Method: EPA 7471 Preparation Method: EPA 7471							
Mercury	**1.1**	mg/kg	0.26	10	08/03/11 07:58	08/04/11 07:20	7439-97-6	M6
Dry Weight	Analytical Method: % Moisture							
Percent Moisture	**25.4**	%	0.10	1		07/25/11 00:00		

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ANALYTICAL RESULTS

Project: BlackPine Mine
Pace Project No.: 10163437

Sample: CML-SD-43 **Lab ID: 10163437002** Collected: 07/12/11 09:30 Received: 07/15/11 09:25 Matrix: Solid

Results reported on a "dry-weight" basis

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
6010 MET ICP	Analytical Method: EPA 6010 Preparation Method: EPA 3050							
Antimony	**20.0**	mg/kg	3.1	5	07/29/11 13:53	08/01/11 17:48	7440-36-0	
Arsenic	**32.9**	mg/kg	3.1	5	07/29/11 13:53	08/01/11 17:48	7440-38-2	
Barium	**485**	mg/kg	3.1	5	07/29/11 13:53	08/01/11 17:48	7440-39-3	
Cadmium	**4.2**	mg/kg	0.31	5	07/29/11 13:53	08/01/11 17:48	7440-43-9	
Chromium	**10.9**	mg/kg	3.1	5	07/29/11 13:53	08/01/11 17:48	7440-47-3	
Copper	**131**	mg/kg	3.1	5	07/29/11 13:53	08/01/11 17:48	7440-50-8	
Iron	**13100**	mg/kg	15.4	5	07/29/11 13:53	08/01/11 17:48	7439-89-6	
Lead	**136**	mg/kg	1.8	5	07/29/11 13:53	08/01/11 17:48	7439-92-1	
Manganese	**936**	mg/kg	1.5	5	07/29/11 13:53	08/01/11 17:48	7439-96-5	
Nickel	**12.7**	mg/kg	6.1	5	07/29/11 13:53	08/01/11 17:48	7440-02-0	
Silver	**<3.1**	mg/kg	3.1	5	07/29/11 13:53	08/01/11 17:48	7440-22-4	
Zinc	**211**	mg/kg	6.1	5	07/29/11 13:53	08/01/11 17:48	7440-66-6	
7471 Mercury	Analytical Method: EPA 7471 Preparation Method: EPA 7471							
Mercury	**3.3**	mg/kg	0.29	10	08/03/11 07:58	08/04/11 07:31	7439-97-6	
Dry Weight	Analytical Method: % Moisture							
Percent Moisture	**30.5**	%	0.10	1		07/25/11 00:00		

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ANALYTICAL RESULTS

Project: BlackPine Mine
Pace Project No.: 10163437

Sample: CML-SD-40 **Lab ID: 10163437003** Collected: 07/12/11 09:40 Received: 07/15/11 09:25 Matrix: Solid

Results reported on a "dry-weight" basis

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
6010 MET ICP	Analytical Method: EPA 6010 Preparation Method: EPA 3050							
Antimony	**11.1**	mg/kg	3.0	5	07/29/11 13:53	08/01/11 18:03	7440-36-0	
Arsenic	**16.5**	mg/kg	3.0	5	07/29/11 13:53	08/01/11 18:03	7440-38-2	
Barium	**437**	mg/kg	3.0	5	07/29/11 13:53	08/01/11 18:03	7440-39-3	
Cadmium	**1.6**	mg/kg	0.30	5	07/29/11 13:53	08/01/11 18:03	7440-43-9	
Chromium	**10.3**	mg/kg	3.0	5	07/29/11 13:53	08/01/11 18:03	7440-47-3	
Copper	**75.5**	mg/kg	3.0	5	07/29/11 13:53	08/01/11 18:03	7440-50-8	
Iron	**11300**	mg/kg	15.0	5	07/29/11 13:53	08/01/11 18:03	7439-89-6	
Lead	**88.0**	mg/kg	1.8	5	07/29/11 13:53	08/01/11 18:03	7439-92-1	
Manganese	**781**	mg/kg	1.5	5	07/29/11 13:53	08/01/11 18:03	7439-96-5	
Nickel	**13.9**	mg/kg	6.0	5	07/29/11 13:53	08/01/11 18:03	7440-02-0	
Silver	**<3.0**	mg/kg	3.0	5	07/29/11 13:53	08/01/11 18:03	7440-22-4	
Zinc	**127**	mg/kg	6.0	5	07/29/11 13:53	08/01/11 18:03	7440-66-6	
7471 Mercury	Analytical Method: EPA 7471 Preparation Method: EPA 7471							
Mercury	**2.1**	mg/kg	0.35	10	08/03/11 07:58	08/04/11 07:33	7439-97-6	
Dry Weight	Analytical Method: % Moisture							
Percent Moisture	**44.3**	%	0.10	1		07/25/11 00:00		

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ANALYTICAL RESULTS

Project: BlackPine Mine
Pace Project No.: 10163437

Sample: CML-SD-37 **Lab ID: 10163437004** Collected: 07/12/11 09:45 Received: 07/15/11 09:25 Matrix: Solid

Results reported on a "dry-weight" basis

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
6010 MET ICP	Analytical Method: EPA 6010 Preparation Method: EPA 3050							
Antimony	**88.9**	mg/kg	2.3	5	07/29/11 13:53	08/01/11 18:08	7440-36-0	
Arsenic	**118**	mg/kg	2.3	5	07/29/11 13:53	08/01/11 18:08	7440-38-2	
Barium	**249**	mg/kg	2.3	5	07/29/11 13:53	08/01/11 18:08	7440-39-3	
Cadmium	**4.4**	mg/kg	0.23	5	07/29/11 13:53	08/01/11 18:08	7440-43-9	
Chromium	**25.8**	mg/kg	2.3	5	07/29/11 13:53	08/01/11 18:08	7440-47-3	
Copper	**276**	mg/kg	2.3	5	07/29/11 13:53	08/01/11 18:08	7440-50-8	
Iron	**36900**	mg/kg	11.3	5	07/29/11 13:53	08/01/11 18:08	7439-89-6	
Lead	**693**	mg/kg	1.4	5	07/29/11 13:53	08/01/11 18:08	7439-92-1	
Manganese	**569**	mg/kg	1.1	5	07/29/11 13:53	08/01/11 18:08	7439-96-5	
Nickel	**4.7**	mg/kg	4.5	5	07/29/11 13:53	08/01/11 18:08	7440-02-0	
Silver	**10.8**	mg/kg	2.3	5	07/29/11 13:53	08/01/11 18:08	7440-22-4	
Zinc	**164**	mg/kg	4.5	5	07/29/11 13:53	08/01/11 18:08	7440-66-6	
7471 Mercury	Analytical Method: EPA 7471 Preparation Method: EPA 7471							
Mercury	**8.1**	mg/kg	0.21	10	08/03/11 07:58	08/04/11 07:35	7439-97-6	
Dry Weight	Analytical Method: % Moisture							
Percent Moisture	**3.8**	%	0.10	1		07/25/11 00:00		

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ANALYTICAL RESULTS

Project: BlackPine Mine
Pace Project No.: 10163437

Sample: CML-SD-36 **Lab ID: 10163437005** Collected: 07/12/11 09:55 Received: 07/15/11 09:25 Matrix: Solid

Results reported on a "dry-weight" basis

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
6010 MET ICP	Analytical Method: EPA 6010 Preparation Method: EPA 3050							
Antimony	**105**	mg/kg	2.3	5	07/29/11 13:53	08/01/11 18:20	7440-36-0	
Arsenic	**125**	mg/kg	2.3	5	07/29/11 13:53	08/01/11 18:20	7440-38-2	
Barium	**259**	mg/kg	2.3	5	07/29/11 13:53	08/01/11 18:20	7440-39-3	
Cadmium	**6.2**	mg/kg	0.23	5	07/29/11 13:53	08/01/11 18:20	7440-43-9	
Chromium	**5.5**	mg/kg	2.3	5	07/29/11 13:53	08/01/11 18:20	7440-47-3	
Copper	**479**	mg/kg	2.3	5	07/29/11 13:53	08/01/11 18:20	7440-50-8	
Iron	**9620**	mg/kg	11.6	5	07/29/11 13:53	08/01/11 18:20	7439-89-6	
Lead	**769**	mg/kg	1.4	5	07/29/11 13:53	08/01/11 18:20	7439-92-1	
Manganese	**788**	mg/kg	1.2	5	07/29/11 13:53	08/01/11 18:20	7439-96-5	
Nickel	**6.5**	mg/kg	4.7	5	07/29/11 13:53	08/01/11 18:20	7440-02-0	
Silver	**18.8**	mg/kg	2.3	5	07/29/11 13:53	08/01/11 18:20	7440-22-4	
Zinc	**107**	mg/kg	4.7	5	07/29/11 13:53	08/01/11 18:20	7440-66-6	
7471 Mercury	Analytical Method: EPA 7471 Preparation Method: EPA 7471							
Mercury	**9.3**	mg/kg	2.5	100	08/03/11 07:58	08/04/11 07:47	7439-97-6	
Dry Weight	Analytical Method: % Moisture							
Percent Moisture	**20.5**	%	0.10	1		07/25/11 00:00		

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ANALYTICAL RESULTS

Project: BlackPine Mine
Pace Project No.: 10163437

Sample: CML-SD-34 **Lab ID: 10163437006** Collected: 07/12/11 10:10 Received: 07/15/11 09:25 Matrix: Solid

Results reported on a "dry-weight" basis

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
6010 MET ICP	Analytical Method: EPA 6010 Preparation Method: EPA 3050							
Antimony	**683**	mg/kg	5.9	5	07/29/11 13:53	08/01/11 18:26	7440-36-0	
Arsenic	**315**	mg/kg	5.9	5	07/29/11 13:53	08/01/11 18:26	7440-38-2	
Barium	**269**	mg/kg	5.9	5	07/29/11 13:53	08/01/11 18:26	7440-39-3	
Cadmium	**15.6**	mg/kg	0.59	5	07/29/11 13:53	08/01/11 18:26	7440-43-9	
Chromium	**13.6**	mg/kg	5.9	5	07/29/11 13:53	08/01/11 18:26	7440-47-3	
Copper	**2240**	mg/kg	5.9	5	07/29/11 13:53	08/01/11 18:26	7440-50-8	
Iron	**18800**	mg/kg	29.6	5	07/29/11 13:53	08/01/11 18:26	7439-89-6	
Lead	**2840**	mg/kg	3.6	5	07/29/11 13:53	08/01/11 18:26	7439-92-1	
Manganese	**165**	mg/kg	3.0	5	07/29/11 13:53	08/01/11 18:26	7439-96-5	
Nickel	**<11.9**	mg/kg	11.9	5	07/29/11 13:53	08/01/11 18:26	7440-02-0	
Silver	**29.6**	mg/kg	5.9	5	07/29/11 13:53	08/01/11 18:26	7440-22-4	
Zinc	**333**	mg/kg	11.9	5	07/29/11 13:53	08/01/11 18:26	7440-66-6	
7471 Mercury	Analytical Method: EPA 7471 Preparation Method: EPA 7471							
Mercury	**55.4**	mg/kg	5.4	100	08/03/11 07:58	08/04/11 07:54	7439-97-6	
Dry Weight	Analytical Method: % Moisture							
Percent Moisture	**62.7**	%	0.10	1		07/25/11 00:00		

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ANALYTICAL RESULTS

Project: BlackPine Mine
Pace Project No.: 10163437

Sample: CML-SD-35 **Lab ID: 10163437007** Collected: 07/12/11 10:15 Received: 07/15/11 09:25 Matrix: Solid

Results reported on a "dry-weight" basis

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
6010 MET ICP	Analytical Method: EPA 6010 Preparation Method: EPA 3050							
Antimony	**293**	mg/kg	2.6	5	07/29/11 13:53	08/01/11 18:31	7440-36-0	
Arsenic	**305**	mg/kg	2.6	5	07/29/11 13:53	08/01/11 18:31	7440-38-2	
Barium	**271**	mg/kg	2.6	5	07/29/11 13:53	08/01/11 18:31	7440-39-3	
Cadmium	**12.9**	mg/kg	0.26	5	07/29/11 13:53	08/01/11 18:31	7440-43-9	
Chromium	**9.8**	mg/kg	2.6	5	07/29/11 13:53	08/01/11 18:31	7440-47-3	
Copper	**1740**	mg/kg	2.6	5	07/29/11 13:53	08/01/11 18:31	7440-50-8	
Iron	**22100**	mg/kg	13.1	5	07/29/11 13:53	08/01/11 18:31	7439-89-6	
Lead	**2200**	mg/kg	1.6	5	07/29/11 13:53	08/01/11 18:31	7439-92-1	
Manganese	**666**	mg/kg	1.3	5	07/29/11 13:53	08/01/11 18:31	7439-96-5	
Nickel	**7.5**	mg/kg	5.2	5	07/29/11 13:53	08/01/11 18:31	7440-02-0	
Silver	**31.3**	mg/kg	2.6	5	07/29/11 13:53	08/01/11 18:31	7440-22-4	
Zinc	**344**	mg/kg	5.2	5	07/29/11 13:53	08/01/11 18:31	7440-66-6	
7471 Mercury	Analytical Method: EPA 7471 Preparation Method: EPA 7471							
Mercury	**57.9**	mg/kg	2.7	100	08/03/11 07:58	08/04/11 08:02	7439-97-6	
Dry Weight	Analytical Method: % Moisture							
Percent Moisture	**27.0**	%	0.10	1		07/25/11 00:00		

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ANALYTICAL RESULTS

Project: BlackPine Mine
Pace Project No.: 10163437

Sample: CML-SD-38 **Lab ID: 10163437008** Collected: 07/12/11 10:25 Received: 07/15/11 09:25 Matrix: Solid

Results reported on a "dry-weight" basis

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
6010 MET ICP	Analytical Method: EPA 6010 Preparation Method: EPA 3050							
Antimony	**69.3**	mg/kg	2.7	5	07/29/11 13:53	08/01/11 18:38	7440-36-0	
Arsenic	**101**	mg/kg	2.7	5	07/29/11 13:53	08/01/11 18:38	7440-38-2	
Barium	**284**	mg/kg	2.7	5	07/29/11 13:53	08/01/11 18:38	7440-39-3	
Cadmium	**4.4**	mg/kg	0.27	5	07/29/11 13:53	08/01/11 18:38	7440-43-9	
Chromium	**10.3**	mg/kg	2.7	5	07/29/11 13:53	08/01/11 18:38	7440-47-3	
Copper	**375**	mg/kg	2.7	5	07/29/11 13:53	08/01/11 18:38	7440-50-8	
Iron	**16400**	mg/kg	13.3	5	07/29/11 13:53	08/01/11 18:38	7439-89-6	
Lead	**518**	mg/kg	1.6	5	07/29/11 13:53	08/01/11 18:38	7439-92-1	
Manganese	**1300**	mg/kg	1.3	5	07/29/11 13:53	08/01/11 18:38	7439-96-5	
Nickel	**7.1**	mg/kg	5.3	5	07/29/11 13:53	08/01/11 18:38	7440-02-0	
Silver	**8.3**	mg/kg	2.7	5	07/29/11 13:53	08/01/11 18:38	7440-22-4	
Zinc	**134**	mg/kg	5.3	5	07/29/11 13:53	08/01/11 18:38	7440-66-6	
7471 Mercury	Analytical Method: EPA 7471 Preparation Method: EPA 7471							
Mercury	**9.7**	mg/kg	2.3	100	08/03/11 07:58	08/04/11 08:09	7439-97-6	
Dry Weight	Analytical Method: % Moisture							
Percent Moisture	**15.8**	%	0.10	1		07/25/11 00:00		

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ANALYTICAL RESULTS

Project: BlackPine Mine
Pace Project No.: 10163437

Sample: CML-SD-41 **Lab ID: 10163437009** Collected: 07/12/11 10:35 Received: 07/15/11 09:25 Matrix: Solid

Results reported on a "dry-weight" basis

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
6010 MET ICP	Analytical Method: EPA 6010 Preparation Method: EPA 3050							
Antimony	**239**	mg/kg	2.5	5	07/29/11 13:53	08/01/11 18:45	7440-36-0	
Arsenic	**270**	mg/kg	2.5	5	07/29/11 13:53	08/01/11 18:45	7440-38-2	
Barium	**191**	mg/kg	2.5	5	07/29/11 13:53	08/01/11 18:45	7440-39-3	
Cadmium	**13.1**	mg/kg	0.25	5	07/29/11 13:53	08/01/11 18:45	7440-43-9	
Chromium	**8.9**	mg/kg	2.5	5	07/29/11 13:53	08/01/11 18:45	7440-47-3	
Copper	**653**	mg/kg	2.5	5	07/29/11 13:53	08/01/11 18:45	7440-50-8	
Iron	**24900**	mg/kg	12.5	5	07/29/11 13:53	08/01/11 18:45	7439-89-6	
Lead	**1570**	mg/kg	1.5	5	07/29/11 13:53	08/01/11 18:45	7439-92-1	
Manganese	**485**	mg/kg	1.3	5	07/29/11 13:53	08/01/11 18:45	7439-96-5	
Nickel	**<5.0**	mg/kg	5.0	5	07/29/11 13:53	08/01/11 18:45	7440-02-0	
Silver	**46.3**	mg/kg	2.5	5	07/29/11 13:53	08/01/11 18:45	7440-22-4	
Zinc	**170**	mg/kg	5.0	5	07/29/11 13:53	08/01/11 18:45	7440-66-6	
7471 Mercury	Analytical Method: EPA 7471 Preparation Method: EPA 7471							
Mercury	**5.4**	mg/kg	0.21	10	08/03/11 07:58	08/04/11 08:24	7439-97-6	
Dry Weight	Analytical Method: % Moisture							
Percent Moisture	**9.3**	%	0.10	1		07/25/11 00:00		

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ANALYTICAL RESULTS

Project: BlackPine Mine
Pace Project No.: 10163437

Sample: CML-SD-44 **Lab ID: 10163437010** Collected: 07/12/11 10:40 Received: 07/15/11 09:25 Matrix: Solid

Results reported on a "dry-weight" basis

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
6010 MET ICP	Analytical Method: EPA 6010 Preparation Method: EPA 3050							
Antimony	**7.9**	mg/kg	3.3	5	07/29/11 13:53	08/01/11 18:51	7440-36-0	
Arsenic	**29.5**	mg/kg	3.3	5	07/29/11 13:53	08/01/11 18:51	7440-38-2	
Barium	**437**	mg/kg	3.3	5	07/29/11 13:53	08/01/11 18:51	7440-39-3	
Cadmium	**1.3**	mg/kg	0.33	5	07/29/11 13:53	08/01/11 18:51	7440-43-9	
Chromium	**23.9**	mg/kg	3.3	5	07/29/11 13:53	08/01/11 18:51	7440-47-3	
Copper	**97.9**	mg/kg	3.3	5	07/29/11 13:53	08/01/11 18:51	7440-50-8	
Iron	**37400**	mg/kg	16.5	5	07/29/11 13:53	08/01/11 18:51	7439-89-6	
Lead	**168**	mg/kg	2.0	5	07/29/11 13:53	08/01/11 18:51	7439-92-1	
Manganese	**160**	mg/kg	1.7	5	07/29/11 13:53	08/01/11 18:51	7439-96-5	
Nickel	**19.2**	mg/kg	6.6	5	07/29/11 13:53	08/01/11 18:51	7440-02-0	
Silver	**<3.3**	mg/kg	3.3	5	07/29/11 13:53	08/01/11 18:51	7440-22-4	
Zinc	**202**	mg/kg	6.6	5	07/29/11 13:53	08/01/11 18:51	7440-66-6	
7471 Mercury	Analytical Method: EPA 7471 Preparation Method: EPA 7471							
Mercury	**6.9**	mg/kg	0.32	10	08/03/11 07:58	08/04/11 08:26	7439-97-6	
Dry Weight	Analytical Method: % Moisture							
Percent Moisture	**38.4**	%	0.10	1		07/25/11 00:00		

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ANALYTICAL RESULTS

Project: BlackPine Mine
Pace Project No.: 10163437

Sample: CML-SD-46 **Lab ID: 10163437011** Collected: 07/12/11 10:45 Received: 07/15/11 09:25 Matrix: Solid

Results reported on a "dry-weight" basis

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
6010 MET ICP	Analytical Method: EPA 6010 Preparation Method: EPA 3050							
Antimony	**8.0**	mg/kg	4.9	5	07/29/11 13:53	08/01/11 18:57	7440-36-0	
Arsenic	**10.5**	mg/kg	4.9	5	07/29/11 13:53	08/01/11 18:57	7440-38-2	
Barium	**489**	mg/kg	4.9	5	07/29/11 13:53	08/01/11 18:57	7440-39-3	
Cadmium	**1.5**	mg/kg	0.49	5	07/29/11 13:53	08/01/11 18:57	7440-43-9	
Chromium	**24.2**	mg/kg	4.9	5	07/29/11 13:53	08/01/11 18:57	7440-47-3	
Copper	**68.9**	mg/kg	4.9	5	07/29/11 13:53	08/01/11 18:57	7440-50-8	
Iron	**25900**	mg/kg	24.6	5	07/29/11 13:53	08/01/11 18:57	7439-89-6	
Lead	**55.0**	mg/kg	3.0	5	07/29/11 13:53	08/01/11 18:57	7439-92-1	
Manganese	**183**	mg/kg	2.5	5	07/29/11 13:53	08/01/11 18:57	7439-96-5	
Nickel	**25.4**	mg/kg	9.9	5	07/29/11 13:53	08/01/11 18:57	7440-02-0	
Silver	**<4.9**	mg/kg	4.9	5	07/29/11 13:53	08/01/11 18:57	7440-22-4	
Zinc	**227**	mg/kg	9.9	5	07/29/11 13:53	08/01/11 18:57	7440-66-6	
7471 Mercury	Analytical Method: EPA 7471 Preparation Method: EPA 7471							
Mercury	**12.7**	mg/kg	0.48	10	08/03/11 07:58	08/04/11 08:28	7439-97-6	
Dry Weight	Analytical Method: % Moisture							
Percent Moisture	**60.7**	%	0.10	1		07/25/11 00:00		

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ANALYTICAL RESULTS

Project: BlackPine Mine
Pace Project No.: 10163437

Sample: CML-SD-33-00 **Lab ID: 10163437012** Collected: 07/12/11 11:45 Received: 07/15/11 09:25 Matrix: Solid

Results reported on a "dry-weight" basis

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
6010 MET ICP	Analytical Method: EPA 6010 Preparation Method: EPA 3050							
Antimony	**159**	mg/kg	2.6	5	07/29/11 13:53	08/01/11 19:03	7440-36-0	
Arsenic	**155**	mg/kg	2.6	5	07/29/11 13:53	08/01/11 19:03	7440-38-2	
Barium	**448**	mg/kg	2.6	5	07/29/11 13:53	08/01/11 19:03	7440-39-3	
Cadmium	**9.0**	mg/kg	0.26	5	07/29/11 13:53	08/01/11 19:03	7440-43-9	
Chromium	**11.4**	mg/kg	2.6	5	07/29/11 13:53	08/01/11 19:03	7440-47-3	
Copper	**1260**	mg/kg	2.6	5	07/29/11 13:53	08/01/11 19:03	7440-50-8	
Iron	**13400**	mg/kg	12.9	5	07/29/11 13:53	08/01/11 19:03	7439-89-6	
Lead	**925**	mg/kg	1.6	5	07/29/11 13:53	08/01/11 19:03	7439-92-1	
Manganese	**127**	mg/kg	1.3	5	07/29/11 13:53	08/01/11 19:03	7439-96-5	
Nickel	**7.2**	mg/kg	5.2	5	07/29/11 13:53	08/01/11 19:03	7440-02-0	
Silver	**11.1**	mg/kg	2.6	5	07/29/11 13:53	08/01/11 19:03	7440-22-4	
Zinc	**200**	mg/kg	5.2	5	07/29/11 13:53	08/01/11 19:03	7440-66-6	
7471 Mercury	Analytical Method: EPA 7471 Preparation Method: EPA 7471							
Mercury	**4.3**	mg/kg	0.22	10	08/03/11 07:58	08/04/11 08:30	7439-97-6	
Dry Weight	Analytical Method: % Moisture							
Percent Moisture	**15.9**	%	0.10	1		07/25/11 00:00		

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ANALYTICAL RESULTS

Project: BlackPine Mine
Pace Project No.: 10163437

Sample: CML-SD-33-01 **Lab ID: 10163437013** Collected: 07/12/11 11:55 Received: 07/15/11 09:25 Matrix: Solid

Results reported on a "dry-weight" basis

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
6010 MET ICP	Analytical Method: EPA 6010 Preparation Method: EPA 3050							
Antimony	**511**	mg/kg	2.3	5	07/29/11 13:53	08/01/11 19:10	7440-36-0	
Arsenic	**527**	mg/kg	2.3	5	07/29/11 13:53	08/01/11 19:10	7440-38-2	
Barium	**210**	mg/kg	2.3	5	07/29/11 13:53	08/01/11 19:10	7440-39-3	
Cadmium	**20.6**	mg/kg	0.23	5	07/29/11 13:53	08/01/11 19:10	7440-43-9	
Chromium	**3.1**	mg/kg	2.3	5	07/29/11 13:53	08/01/11 19:10	7440-47-3	
Copper	**1420**	mg/kg	2.3	5	07/29/11 13:53	08/01/11 19:10	7440-50-8	
Iron	**14200**	mg/kg	11.7	5	07/29/11 13:53	08/01/11 19:10	7439-89-6	
Lead	**2940**	mg/kg	1.4	5	07/29/11 13:53	08/01/11 19:10	7439-92-1	
Manganese	**163**	mg/kg	1.2	5	07/29/11 13:53	08/01/11 19:10	7439-96-5	
Nickel	**<4.7**	mg/kg	4.7	5	07/29/11 13:53	08/01/11 19:10	7440-02-0	
Silver	**46.6**	mg/kg	2.3	5	07/29/11 13:53	08/01/11 19:10	7440-22-4	
Zinc	**260**	mg/kg	4.7	5	07/29/11 13:53	08/01/11 19:10	7440-66-6	
7471 Mercury	Analytical Method: EPA 7471 Preparation Method: EPA 7471							
Mercury	**1.1**	mg/kg	0.22	10	08/03/11 07:58	08/04/11 08:36	7439-97-6	
Dry Weight	Analytical Method: % Moisture							
Percent Moisture	**10.1**	%	0.10	1		07/25/11 00:00		

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ANALYTICAL RESULTS

Project: BlackPine Mine
Pace Project No.: 10163437

Sample: CML-SD-32-00 **Lab ID: 10163437014** Collected: 07/12/11 12:10 Received: 07/15/11 09:25 Matrix: Solid

Results reported on a "dry-weight" basis

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
6010 MET ICP	Analytical Method: EPA 6010 Preparation Method: EPA 3050							
Antimony	**463**	mg/kg	2.6	5	07/29/11 13:53	08/01/11 19:24	7440-36-0	
Arsenic	**449**	mg/kg	2.6	5	07/29/11 13:53	08/01/11 19:24	7440-38-2	
Barium	**421**	mg/kg	2.6	5	07/29/11 13:53	08/01/11 19:24	7440-39-3	
Cadmium	**16.0**	mg/kg	0.26	5	07/29/11 13:53	08/01/11 19:24	7440-43-9	
Chromium	**7.9**	mg/kg	2.6	5	07/29/11 13:53	08/01/11 19:24	7440-47-3	
Copper	**921**	mg/kg	2.6	5	07/29/11 13:53	08/01/11 19:24	7440-50-8	
Iron	**19300**	mg/kg	13.2	5	07/29/11 13:53	08/01/11 19:24	7439-89-6	
Lead	**2470**	mg/kg	1.6	5	07/29/11 13:53	08/01/11 19:24	7439-92-1	
Manganese	**558**	mg/kg	1.3	5	07/29/11 13:53	08/01/11 19:24	7439-96-5	
Nickel	**7.2**	mg/kg	5.3	5	07/29/11 13:53	08/01/11 19:24	7440-02-0	
Silver	**21.6**	mg/kg	2.6	5	07/29/11 13:53	08/01/11 19:24	7440-22-4	
Zinc	**387**	mg/kg	5.3	5	07/29/11 13:53	08/01/11 19:24	7440-66-6	
7471 Mercury	Analytical Method: EPA 7471 Preparation Method: EPA 7471							
Mercury	**10.9**	mg/kg	2.5	100	08/03/11 07:58	08/04/11 08:43	7439-97-6	
Dry Weight	Analytical Method: % Moisture							
Percent Moisture	**29.7**	%	0.10	1		07/25/11 00:00		

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ANALYTICAL RESULTS

Project: BlackPine Mine
Pace Project No.: 10163437

Sample: CML-SD-31-00 **Lab ID: 10163437015** Collected: 07/12/11 12:20 Received: 07/15/11 09:25 Matrix: Solid

Results reported on a "dry-weight" basis

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
6010 MET ICP	Analytical Method: EPA 6010 Preparation Method: EPA 3050							
Antimony	**272**	mg/kg	2.2	5	07/29/11 13:53	08/01/11 19:31	7440-36-0	
Arsenic	**301**	mg/kg	2.2	5	07/29/11 13:53	08/01/11 19:31	7440-38-2	
Barium	**451**	mg/kg	2.2	5	07/29/11 13:53	08/01/11 19:31	7440-39-3	
Cadmium	**13.5**	mg/kg	0.22	5	07/29/11 13:53	08/01/11 19:31	7440-43-9	
Chromium	**11.7**	mg/kg	2.2	5	07/29/11 13:53	08/01/11 19:31	7440-47-3	
Copper	**2950**	mg/kg	2.2	5	07/29/11 13:53	08/01/11 19:31	7440-50-8	
Iron	**22600**	mg/kg	10.8	5	07/29/11 13:53	08/01/11 19:31	7439-89-6	
Lead	**1350**	mg/kg	1.3	5	07/29/11 13:53	08/01/11 19:31	7439-92-1	
Manganese	**1040**	mg/kg	1.1	5	07/29/11 13:53	08/01/11 19:31	7439-96-5	
Nickel	**9.5**	mg/kg	4.3	5	07/29/11 13:53	08/01/11 19:31	7440-02-0	
Silver	**19.3**	mg/kg	2.2	5	07/29/11 13:53	08/01/11 19:31	7440-22-4	
Zinc	**370**	mg/kg	4.3	5	07/29/11 13:53	08/01/11 19:31	7440-66-6	
7471 Mercury	Analytical Method: EPA 7471 Preparation Method: EPA 7471							
Mercury	**2.1**	mg/kg	0.22	10	08/03/11 07:58	08/04/11 08:46	7439-97-6	
Dry Weight	Analytical Method: % Moisture							
Percent Moisture	**14.2**	%	0.10	1		07/25/11 00:00		

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ANALYTICAL RESULTS

Project: BlackPine Mine
Pace Project No.: 10163437

Sample: CML-SD-31-02 **Lab ID: 10163437016** Collected: 07/12/11 12:35 Received: 07/15/11 09:25 Matrix: Solid

Results reported on a "dry-weight" basis

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
6010 MET ICP	Analytical Method: EPA 6010 Preparation Method: EPA 3050							
Antimony	**406**	mg/kg	2.6	5	07/29/11 13:53	08/01/11 19:37	7440-36-0	
Arsenic	**382**	mg/kg	2.6	5	07/29/11 13:53	08/01/11 19:37	7440-38-2	
Barium	**296**	mg/kg	2.6	5	07/29/11 13:53	08/01/11 19:37	7440-39-3	
Cadmium	**17.9**	mg/kg	0.26	5	07/29/11 13:53	08/01/11 19:37	7440-43-9	
Chromium	**8.3**	mg/kg	2.6	5	07/29/11 13:53	08/01/11 19:37	7440-47-3	
Copper	**1950**	mg/kg	2.6	5	07/29/11 13:53	08/01/11 19:37	7440-50-8	
Iron	**18900**	mg/kg	13.0	5	07/29/11 13:53	08/01/11 19:37	7439-89-6	
Lead	**2350**	mg/kg	1.6	5	07/29/11 13:53	08/01/11 19:37	7439-92-1	
Manganese	**1190**	mg/kg	1.3	5	07/29/11 13:53	08/01/11 19:37	7439-96-5	
Nickel	**10.4**	mg/kg	5.2	5	07/29/11 13:53	08/01/11 19:37	7440-02-0	
Silver	**39.2**	mg/kg	2.6	5	07/29/11 13:53	08/01/11 19:37	7440-22-4	
Zinc	**246**	mg/kg	5.2	5	07/29/11 13:53	08/01/11 19:37	7440-66-6	
7471 Mercury	Analytical Method: EPA 7471 Preparation Method: EPA 7471							
Mercury	**3.8**	mg/kg	0.23	10	08/03/11 07:58	08/04/11 08:48	7439-97-6	
Dry Weight	Analytical Method: % Moisture							
Percent Moisture	**22.2**	%	0.10	1		07/25/11 00:00		

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ANALYTICAL RESULTS

Project: BlackPine Mine
Pace Project No.: 10163437

Sample: CML-SD-29-00 **Lab ID: 10163437017** Collected: 07/12/11 12:50 Received: 07/15/11 09:25 Matrix: Solid

Results reported on a "dry-weight" basis

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
6010 MET ICP	Analytical Method: EPA 6010 Preparation Method: EPA 3050							
Antimony	**706**	mg/kg	2.4	5	07/29/11 13:53	08/01/11 19:44	7440-36-0	
Arsenic	**630**	mg/kg	2.4	5	07/29/11 13:53	08/01/11 19:44	7440-38-2	
Barium	**359**	mg/kg	2.4	5	07/29/11 13:53	08/01/11 19:44	7440-39-3	
Cadmium	**27.6**	mg/kg	0.24	5	07/29/11 13:53	08/01/11 19:44	7440-43-9	
Chromium	**3.7**	mg/kg	2.4	5	07/29/11 13:53	08/01/11 19:44	7440-47-3	
Copper	**2060**	mg/kg	2.4	5	07/29/11 13:53	08/01/11 19:44	7440-50-8	
Iron	**17300**	mg/kg	12.2	5	07/29/11 13:53	08/01/11 19:44	7439-89-6	
Lead	**3890**	mg/kg	1.5	5	07/29/11 13:53	08/01/11 19:44	7439-92-1	
Manganese	**352**	mg/kg	1.2	5	07/29/11 13:53	08/01/11 19:44	7439-96-5	
Nickel	**<4.9**	mg/kg	4.9	5	07/29/11 13:53	08/01/11 19:44	7440-02-0	
Silver	**58.1**	mg/kg	2.4	5	07/29/11 13:53	08/01/11 19:44	7440-22-4	
Zinc	**359**	mg/kg	4.9	5	07/29/11 13:53	08/01/11 19:44	7440-66-6	
7471 Mercury	Analytical Method: EPA 7471 Preparation Method: EPA 7471							
Mercury	**4.1**	mg/kg	0.21	10	08/03/11 07:58	08/04/11 08:50	7439-97-6	
Dry Weight	Analytical Method: % Moisture							
Percent Moisture	**6.0**	%	0.10	1		07/25/11 00:00		

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ANALYTICAL RESULTS

Project: BlackPine Mine
Pace Project No.: 10163437

Sample: CML-SD-28-00 **Lab ID: 10163437018** Collected: 07/12/11 12:55 Received: 07/15/11 09:25 Matrix: Solid

Results reported on a "dry-weight" basis

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
6010 MET ICP	Analytical Method: EPA 6010 Preparation Method: EPA 3050							
Antimony	**248**	mg/kg	2.4	5	07/29/11 13:53	08/01/11 19:51	7440-36-0	
Arsenic	**265**	mg/kg	2.4	5	07/29/11 13:53	08/01/11 19:51	7440-38-2	
Barium	**647**	mg/kg	2.4	5	07/29/11 13:53	08/01/11 19:51	7440-39-3	
Cadmium	**15.9**	mg/kg	0.24	5	07/29/11 13:53	08/01/11 19:51	7440-43-9	
Chromium	**14.8**	mg/kg	2.4	5	07/29/11 13:53	08/01/11 19:51	7440-47-3	
Copper	**1690**	mg/kg	2.4	5	07/29/11 13:53	08/01/11 19:51	7440-50-8	
Iron	**23500**	mg/kg	12.0	5	07/29/11 13:53	08/01/11 19:51	7439-89-6	
Lead	**1440**	mg/kg	1.4	5	07/29/11 13:53	08/01/11 19:51	7439-92-1	
Manganese	**1070**	mg/kg	1.2	5	07/29/11 13:53	08/01/11 19:51	7439-96-5	
Nickel	**18.3**	mg/kg	4.8	5	07/29/11 13:53	08/01/11 19:51	7440-02-0	
Silver	**14.7**	mg/kg	2.4	5	07/29/11 13:53	08/01/11 19:51	7440-22-4	
Zinc	**343**	mg/kg	4.8	5	07/29/11 13:53	08/01/11 19:51	7440-66-6	
7471 Mercury	Analytical Method: EPA 7471 Preparation Method: EPA 7471							
Mercury	**22.1**	mg/kg	2.4	100	08/03/11 07:58	08/04/11 08:57	7439-97-6	
Dry Weight	Analytical Method: % Moisture							
Percent Moisture	**18.0**	%	0.10	1		07/25/11 00:00		

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ANALYTICAL RESULTS

Project: BlackPine Mine
Pace Project No.: 10163437

Sample: CML-SD-27-00 **Lab ID: 10163437019** Collected: 07/12/11 14:20 Received: 07/15/11 09:25 Matrix: Solid

Results reported on a "dry-weight" basis

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
6010 MET ICP	Analytical Method: EPA 6010 Preparation Method: EPA 3050							
Antimony	**172**	mg/kg	1.9	5	07/29/11 13:53	08/01/11 19:57	7440-36-0	
Arsenic	**176**	mg/kg	1.9	5	07/29/11 13:53	08/01/11 19:57	7440-38-2	
Barium	**185**	mg/kg	1.9	5	07/29/11 13:53	08/01/11 19:57	7440-39-3	
Cadmium	**8.0**	mg/kg	0.19	5	07/29/11 13:53	08/01/11 19:57	7440-43-9	
Chromium	**6.6**	mg/kg	1.9	5	07/29/11 13:53	08/01/11 19:57	7440-47-3	
Copper	**1130**	mg/kg	1.9	5	07/29/11 13:53	08/01/11 19:57	7440-50-8	
Iron	**14100**	mg/kg	9.4	5	07/29/11 13:53	08/01/11 19:57	7439-89-6	
Lead	**1050**	mg/kg	1.1	5	07/29/11 13:53	08/01/11 19:57	7439-92-1	
Manganese	**790**	mg/kg	0.94	5	07/29/11 13:53	08/01/11 19:57	7439-96-5	
Nickel	**6.2**	mg/kg	3.8	5	07/29/11 13:53	08/01/11 19:57	7440-02-0	
Silver	**14.2**	mg/kg	1.9	5	07/29/11 13:53	08/01/11 19:57	7440-22-4	
Zinc	**175**	mg/kg	3.8	5	07/29/11 13:53	08/01/11 19:57	7440-66-6	
7471 Mercury	Analytical Method: EPA 7471 Preparation Method: EPA 7471							
Mercury	**10.4**	mg/kg	0.21	10	08/03/11 07:58	08/04/11 08:59	7439-97-6	
Dry Weight	Analytical Method: % Moisture							
Percent Moisture	**7.3**	%	0.10	1		07/25/11 00:00		

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ANALYTICAL RESULTS

Project: BlackPine Mine
Pace Project No.: 10163437

Sample: CML-SD-24-00 **Lab ID: 10163437020** Collected: 07/12/11 14:30 Received: 07/15/11 09:25 Matrix: Solid

Results reported on a "dry-weight" basis

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
6010 MET ICP	Analytical Method: EPA 6010 Preparation Method: EPA 3050							
Antimony	**95.0**	mg/kg	2.6	5	07/29/11 13:53	08/01/11 20:03	7440-36-0	M1
Arsenic	**109**	mg/kg	2.6	5	07/29/11 13:53	08/01/11 20:03	7440-38-2	
Barium	**371**	mg/kg	2.6	5	07/29/11 13:53	08/01/11 20:03	7440-39-3	M1
Cadmium	**6.5**	mg/kg	0.26	5	07/29/11 13:53	08/01/11 20:03	7440-43-9	
Chromium	**10.0**	mg/kg	2.6	5	07/29/11 13:53	08/01/11 20:03	7440-47-3	
Copper	**500**	mg/kg	2.6	5	07/29/11 13:53	08/01/11 20:03	7440-50-8	M1
Iron	**16500**	mg/kg	12.9	5	07/29/11 13:53	08/01/11 20:03	7439-89-6	P6
Lead	**617**	mg/kg	1.6	5	07/29/11 13:53	08/01/11 20:03	7439-92-1	M1
Manganese	**1190**	mg/kg	1.3	5	07/29/11 13:53	08/01/11 20:03	7439-96-5	
Nickel	**10.4**	mg/kg	5.2	5	07/29/11 13:53	08/01/11 20:03	7440-02-0	
Silver	**7.3**	mg/kg	2.6	5	07/29/11 13:53	08/01/11 20:03	7440-22-4	
Zinc	**269**	mg/kg	5.2	5	07/29/11 13:53	08/01/11 20:03	7440-66-6	M1
7471 Mercury	Analytical Method: EPA 7471 Preparation Method: EPA 7471							
Mercury	**4.9**	mg/kg	0.21	10	08/03/11 07:58	08/04/11 09:01	7439-97-6	M6
Dry Weight	Analytical Method: % Moisture							
Percent Moisture	**9.6**	%	0.10	1		07/25/11 00:00		

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ANALYTICAL RESULTS

Project: BlackPine Mine
Pace Project No.: 10163437

Sample: CML-SD-24-01 **Lab ID: 10163437021** Collected: 07/12/11 14:35 Received: 07/15/11 09:25 Matrix: Solid

Results reported on a "dry-weight" basis

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
6010 MET ICP	Analytical Method: EPA 6010 Preparation Method: EPA 3050							
Antimony	**24.0**	mg/kg	2.9	5	07/29/11 14:32	08/01/11 21:36	7440-36-0	M1
Arsenic	**30.5**	mg/kg	2.9	5	07/29/11 14:32	08/01/11 21:36	7440-38-2	
Barium	**425**	mg/kg	2.9	5	07/29/11 14:32	08/01/11 21:36	7440-39-3	M1
Cadmium	**13.8**	mg/kg	0.29	5	07/29/11 14:32	08/01/11 21:36	7440-43-9	
Chromium	**16.3**	mg/kg	2.9	5	07/29/11 14:32	08/01/11 21:36	7440-47-3	
Copper	**1390**	mg/kg	2.9	5	07/29/11 14:32	08/01/11 21:36	7440-50-8	M1
Iron	**23200**	mg/kg	14.7	5	07/29/11 14:32	08/01/11 21:36	7439-89-6	P6
Lead	**182**	mg/kg	1.8	5	07/29/11 14:32	08/01/11 21:36	7439-92-1	M1
Manganese	**2050**	mg/kg	1.5	5	07/29/11 14:32	08/01/11 21:36	7439-96-5	P6
Nickel	**22.5**	mg/kg	5.9	5	07/29/11 14:32	08/01/11 21:36	7440-02-0	
Silver	**<2.9**	mg/kg	2.9	5	07/29/11 14:32	08/01/11 21:36	7440-22-4	
Zinc	**328**	mg/kg	5.9	5	07/29/11 14:32	08/01/11 21:36	7440-66-6	M1
7471 Mercury	Analytical Method: EPA 7471 Preparation Method: EPA 7471							
Mercury	**5.6**	mg/kg	0.26	10	08/01/11 09:52	08/03/11 13:23	7439-97-6	M6
Dry Weight	Analytical Method: % Moisture							
Percent Moisture	**22.6**	%	0.10	1		07/25/11 00:00		

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ANALYTICAL RESULTS

Project: BlackPine Mine
Pace Project No.: 10163437

Sample: CML-SD-25-00 **Lab ID: 10163437022** Collected: 07/12/11 14:45 Received: 07/15/11 09:25 Matrix: Solid

Results reported on a "dry-weight" basis

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
6010 MET ICP	Analytical Method: EPA 6010 Preparation Method: EPA 3050							
Antimony	**184**	mg/kg	2.1	5	07/29/11 14:32	08/01/11 21:55	7440-36-0	
Arsenic	**232**	mg/kg	2.1	5	07/29/11 14:32	08/01/11 21:55	7440-38-2	
Barium	**515**	mg/kg	2.1	5	07/29/11 14:32	08/01/11 21:55	7440-39-3	
Cadmium	**12.6**	mg/kg	0.21	5	07/29/11 14:32	08/01/11 21:55	7440-43-9	
Chromium	**12.1**	mg/kg	2.1	5	07/29/11 14:32	08/01/11 21:55	7440-47-3	
Copper	**837**	mg/kg	2.1	5	07/29/11 14:32	08/01/11 21:55	7440-50-8	
Iron	**19900**	mg/kg	10.5	5	07/29/11 14:32	08/01/11 21:55	7439-89-6	
Lead	**1210**	mg/kg	1.3	5	07/29/11 14:32	08/01/11 21:55	7439-92-1	
Manganese	**1210**	mg/kg	1.1	5	07/29/11 14:32	08/01/11 21:55	7439-96-5	
Nickel	**13.3**	mg/kg	4.2	5	07/29/11 14:32	08/01/11 21:55	7440-02-0	
Silver	**12.7**	mg/kg	2.1	5	07/29/11 14:32	08/01/11 21:55	7440-22-4	
Zinc	**326**	mg/kg	4.2	5	07/29/11 14:32	08/01/11 21:55	7440-66-6	
7471 Mercury	Analytical Method: EPA 7471 Preparation Method: EPA 7471							
Mercury	**3.5**	mg/kg	0.22	10	08/01/11 09:52	08/03/11 13:29	7439-97-6	
Dry Weight	Analytical Method: % Moisture							
Percent Moisture	**8.6**	%	0.10	1		07/25/11 00:00		

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ANALYTICAL RESULTS

Project: BlackPine Mine
Pace Project No.: 10163437

Sample: CML-SD-26-00 **Lab ID: 10163437023** Collected: 07/12/11 14:50 Received: 07/15/11 09:25 Matrix: Solid

Results reported on a "dry-weight" basis

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
6010 MET ICP	Analytical Method: EPA 6010 Preparation Method: EPA 3050							
Antimony	**312**	mg/kg	2.9	5	07/29/11 14:32	08/01/11 22:06	7440-36-0	
Arsenic	**291**	mg/kg	2.9	5	07/29/11 14:32	08/01/11 22:06	7440-38-2	
Barium	**185**	mg/kg	2.9	5	07/29/11 14:32	08/01/11 22:06	7440-39-3	
Cadmium	**12.3**	mg/kg	0.29	5	07/29/11 14:32	08/01/11 22:06	7440-43-9	
Chromium	**5.0**	mg/kg	2.9	5	07/29/11 14:32	08/01/11 22:06	7440-47-3	
Copper	**654**	mg/kg	2.9	5	07/29/11 14:32	08/01/11 22:06	7440-50-8	
Iron	**13600**	mg/kg	14.3	5	07/29/11 14:32	08/01/11 22:06	7439-89-6	
Lead	**1870**	mg/kg	1.7	5	07/29/11 14:32	08/01/11 22:06	7439-92-1	
Manganese	**598**	mg/kg	1.4	5	07/29/11 14:32	08/01/11 22:06	7439-96-5	
Nickel	**<5.7**	mg/kg	5.7	5	07/29/11 14:32	08/01/11 22:06	7440-02-0	
Silver	**22.7**	mg/kg	2.9	5	07/29/11 14:32	08/01/11 22:06	7440-22-4	
Zinc	**235**	mg/kg	5.7	5	07/29/11 14:32	08/01/11 22:06	7440-66-6	
7471 Mercury	Analytical Method: EPA 7471 Preparation Method: EPA 7471							
Mercury	**4.5**	mg/kg	0.24	10	08/01/11 09:52	08/03/11 13:43	7439-97-6	
Dry Weight	Analytical Method: % Moisture							
Percent Moisture	**20.7**	%	0.10	1		07/25/11 00:00		

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ANALYTICAL RESULTS

Project: BlackPine Mine
Pace Project No.: 10163437

Sample: CML-SD-21-00 **Lab ID: 10163437024** Collected: 07/12/11 15:00 Received: 07/15/11 09:25 Matrix: Solid

Results reported on a "dry-weight" basis

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
6010 MET ICP	Analytical Method: EPA 6010 Preparation Method: EPA 3050							
Antimony	**475**	mg/kg	2.2	5	07/29/11 14:32	08/01/11 22:20	7440-36-0	
Arsenic	**507**	mg/kg	2.2	5	07/29/11 14:32	08/01/11 22:20	7440-38-2	
Barium	**292**	mg/kg	2.2	5	07/29/11 14:32	08/01/11 22:20	7440-39-3	
Cadmium	**22.5**	mg/kg	0.22	5	07/29/11 14:32	08/01/11 22:20	7440-43-9	
Chromium	**5.6**	mg/kg	2.2	5	07/29/11 14:32	08/01/11 22:20	7440-47-3	
Copper	**1630**	mg/kg	2.2	5	07/29/11 14:32	08/01/11 22:20	7440-50-8	
Iron	**19200**	mg/kg	11.1	5	07/29/11 14:32	08/01/11 22:20	7439-89-6	
Lead	**2940**	mg/kg	1.3	5	07/29/11 14:32	08/01/11 22:20	7439-92-1	
Manganese	**474**	mg/kg	1.1	5	07/29/11 14:32	08/01/11 22:20	7439-96-5	
Nickel	**6.3**	mg/kg	4.4	5	07/29/11 14:32	08/01/11 22:20	7440-02-0	
Silver	**43.6**	mg/kg	2.2	5	07/29/11 14:32	08/01/11 22:20	7440-22-4	
Zinc	**413**	mg/kg	4.4	5	07/29/11 14:32	08/01/11 22:20	7440-66-6	
7471 Mercury	Analytical Method: EPA 7471 Preparation Method: EPA 7471							
Mercury	**6.3**	mg/kg	0.26	10	08/01/11 09:52	08/03/11 14:50	7439-97-6	
Dry Weight	Analytical Method: % Moisture							
Percent Moisture	**24.3**	%	0.10	1		07/25/11 00:00		

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ANALYTICAL RESULTS

Project: BlackPine Mine
Pace Project No.: 10163437

Sample: CML-SD-20-00 **Lab ID: 10163437025** Collected: 07/12/11 15:05 Received: 07/15/11 09:25 Matrix: Solid

Results reported on a "dry-weight" basis

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
6010 MET ICP	Analytical Method: EPA 6010 Preparation Method: EPA 3050							
Antimony	**528**	mg/kg	3.4	5	07/29/11 14:32	08/01/11 22:26	7440-36-0	
Arsenic	**617**	mg/kg	3.4	5	07/29/11 14:32	08/01/11 22:26	7440-38-2	
Barium	**430**	mg/kg	3.4	5	07/29/11 14:32	08/01/11 22:26	7440-39-3	
Cadmium	**25.9**	mg/kg	0.34	5	07/29/11 14:32	08/01/11 22:26	7440-43-9	
Chromium	**7.8**	mg/kg	3.4	5	07/29/11 14:32	08/01/11 22:26	7440-47-3	
Copper	**2430**	mg/kg	3.4	5	07/29/11 14:32	08/01/11 22:26	7440-50-8	
Iron	**19400**	mg/kg	17.1	5	07/29/11 14:32	08/01/11 22:26	7439-89-6	
Lead	**3720**	mg/kg	2.1	5	07/29/11 14:32	08/01/11 22:26	7439-92-1	
Manganese	**1280**	mg/kg	1.7	5	07/29/11 14:32	08/01/11 22:26	7439-96-5	
Nickel	**<6.8**	mg/kg	6.8	5	07/29/11 14:32	08/01/11 22:26	7440-02-0	
Silver	**50.7**	mg/kg	3.4	5	07/29/11 14:32	08/01/11 22:26	7440-22-4	
Zinc	**335**	mg/kg	6.8	5	07/29/11 14:32	08/01/11 22:26	7440-66-6	
7471 Mercury	Analytical Method: EPA 7471 Preparation Method: EPA 7471							
Mercury	**8.6**	mg/kg	0.31	10	08/01/11 09:52	08/03/11 14:17	7439-97-6	
Dry Weight	Analytical Method: % Moisture							
Percent Moisture	**36.4**	%	0.10	1		07/25/11 00:00		

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ANALYTICAL RESULTS

Project: BlackPine Mine
Pace Project No.: 10163437

Sample: CML-SD-20-02 **Lab ID: 10163437026** Collected: 07/12/11 15:50 Received: 07/15/11 09:25 Matrix: Solid

Results reported on a "dry-weight" basis

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
6010 MET ICP	Analytical Method: EPA 6010 Preparation Method: EPA 3050							
Antimony	**6.3**	mg/kg	2.8	5	07/29/11 14:32	08/01/11 22:33	7440-36-0	
Arsenic	**29.7**	mg/kg	2.8	5	07/29/11 14:32	08/01/11 22:33	7440-38-2	
Barium	**396**	mg/kg	2.8	5	07/29/11 14:32	08/01/11 22:33	7440-39-3	
Cadmium	**6.6**	mg/kg	0.28	5	07/29/11 14:32	08/01/11 22:33	7440-43-9	
Chromium	**15.5**	mg/kg	2.8	5	07/29/11 14:32	08/01/11 22:33	7440-47-3	
Copper	**136**	mg/kg	2.8	5	07/29/11 14:32	08/01/11 22:33	7440-50-8	
Iron	**27800**	mg/kg	13.8	5	07/29/11 14:32	08/01/11 22:33	7439-89-6	
Lead	**86.1**	mg/kg	1.7	5	07/29/11 14:32	08/01/11 22:33	7439-92-1	
Manganese	**1040**	mg/kg	1.4	5	07/29/11 14:32	08/01/11 22:33	7439-96-5	
Nickel	**23.2**	mg/kg	5.5	5	07/29/11 14:32	08/01/11 22:33	7440-02-0	
Silver	**<2.8**	mg/kg	2.8	5	07/29/11 14:32	08/01/11 22:33	7440-22-4	
Zinc	**231**	mg/kg	5.5	5	07/29/11 14:32	08/01/11 22:33	7440-66-6	
7471 Mercury	Analytical Method: EPA 7471 Preparation Method: EPA 7471							
Mercury	**7.0**	mg/kg	0.27	10	08/01/11 09:52	08/03/11 14:23	7439-97-6	
Dry Weight	Analytical Method: % Moisture							
Percent Moisture	**27.5**	%	0.10	1		07/25/11 00:00		

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ANALYTICAL RESULTS

Project: BlackPine Mine
Pace Project No.: 10163437

Sample: CML-SD-42-00 **Lab ID: 10163437027** Collected: 07/13/11 08:15 Received: 07/15/11 09:25 Matrix: Solid

Results reported on a "dry-weight" basis

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
6010 MET ICP	Analytical Method: EPA 6010 Preparation Method: EPA 3050							
Antimony	**26.2**	mg/kg	2.2	5	07/29/11 14:32	08/01/11 22:39	7440-36-0	
Arsenic	**37.4**	mg/kg	2.2	5	07/29/11 14:32	08/01/11 22:39	7440-38-2	
Barium	**63.2**	mg/kg	2.2	5	07/29/11 14:32	08/01/11 22:39	7440-39-3	
Cadmium	**1.1**	mg/kg	0.22	5	07/29/11 14:32	08/01/11 22:39	7440-43-9	
Chromium	**9.5**	mg/kg	2.2	5	07/29/11 14:32	08/01/11 22:39	7440-47-3	
Copper	**123**	mg/kg	2.2	5	07/29/11 14:32	08/01/11 22:39	7440-50-8	
Iron	**14800**	mg/kg	11.0	5	07/29/11 14:32	08/01/11 22:39	7439-89-6	
Lead	**174**	mg/kg	1.3	5	07/29/11 14:32	08/01/11 22:39	7439-92-1	
Manganese	**88.4**	mg/kg	1.1	5	07/29/11 14:32	08/01/11 22:39	7439-96-5	
Nickel	**<4.4**	mg/kg	4.4	5	07/29/11 14:32	08/01/11 22:39	7440-02-0	
Silver	**<2.2**	mg/kg	2.2	5	07/29/11 14:32	08/01/11 22:39	7440-22-4	
Zinc	**32.6**	mg/kg	4.4	5	07/29/11 14:32	08/01/11 22:39	7440-66-6	
7471 Mercury	Analytical Method: EPA 7471 Preparation Method: EPA 7471							
Mercury	**3.9**	mg/kg	0.22	10	08/01/11 09:52	08/03/11 14:25	7439-97-6	
Dry Weight	Analytical Method: % Moisture							
Percent Moisture	**15.0**	%	0.10	1		07/25/11 00:00		

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ANALYTICAL RESULTS

Project: BlackPine Mine
Pace Project No.: 10163437

Sample: CML-SD-42-02 **Lab ID: 10163437028** Collected: 07/13/11 08:45 Received: 07/15/11 09:25 Matrix: Solid

Results reported on a "dry-weight" basis

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
6010 MET ICP	Analytical Method: EPA 6010 Preparation Method: EPA 3050							
Antimony	**40.5**	mg/kg	2.6	5	07/29/11 14:32	08/01/11 22:46	7440-36-0	
Arsenic	**48.7**	mg/kg	2.6	5	07/29/11 14:32	08/01/11 22:46	7440-38-2	
Barium	**171**	mg/kg	2.6	5	07/29/11 14:32	08/01/11 22:46	7440-39-3	
Cadmium	**2.4**	mg/kg	0.26	5	07/29/11 14:32	08/01/11 22:46	7440-43-9	
Chromium	**11.6**	mg/kg	2.6	5	07/29/11 14:32	08/01/11 22:46	7440-47-3	
Copper	**309**	mg/kg	2.6	5	07/29/11 14:32	08/01/11 22:46	7440-50-8	
Iron	**15400**	mg/kg	12.8	5	07/29/11 14:32	08/01/11 22:46	7439-89-6	
Lead	**240**	mg/kg	1.5	5	07/29/11 14:32	08/01/11 22:46	7439-92-1	
Manganese	**323**	mg/kg	1.3	5	07/29/11 14:32	08/01/11 22:46	7439-96-5	
Nickel	**9.0**	mg/kg	5.1	5	07/29/11 14:32	08/01/11 22:46	7440-02-0	
Silver	**2.7**	mg/kg	2.6	5	07/29/11 14:32	08/01/11 22:46	7440-22-4	
Zinc	**71.9**	mg/kg	5.1	5	07/29/11 14:32	08/01/11 22:46	7440-66-6	
7471 Mercury	Analytical Method: EPA 7471 Preparation Method: EPA 7471							
Mercury	**5.0**	mg/kg	0.24	10	08/01/11 09:52	08/03/11 14:27	7439-97-6	
Dry Weight	Analytical Method: % Moisture							
Percent Moisture	**16.6**	%	0.10	1		07/25/11 00:00		

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ANALYTICAL RESULTS

Project: BlackPine Mine
Pace Project No.: 10163437

Sample: CML-SD-39-00 **Lab ID: 10163437029** Collected: 07/13/11 09:00 Received: 07/15/11 09:25 Matrix: Solid

Results reported on a "dry-weight" basis

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
6010 MET ICP	Analytical Method: EPA 6010 Preparation Method: EPA 3050							
Antimony	**23.0**	mg/kg	2.2	5	07/29/11 14:32	08/01/11 22:53	7440-36-0	
Arsenic	**27.2**	mg/kg	2.2	5	07/29/11 14:32	08/01/11 22:53	7440-38-2	
Barium	**414**	mg/kg	2.2	5	07/29/11 14:32	08/01/11 22:53	7440-39-3	
Cadmium	**2.2**	mg/kg	0.22	5	07/29/11 14:32	08/01/11 22:53	7440-43-9	
Chromium	**10.2**	mg/kg	2.2	5	07/29/11 14:32	08/01/11 22:53	7440-47-3	
Copper	**180**	mg/kg	2.2	5	07/29/11 14:32	08/01/11 22:53	7440-50-8	
Iron	**11900**	mg/kg	11.0	5	07/29/11 14:32	08/01/11 22:53	7439-89-6	
Lead	**238**	mg/kg	1.3	5	07/29/11 14:32	08/01/11 22:53	7439-92-1	
Manganese	**415**	mg/kg	1.1	5	07/29/11 14:32	08/01/11 22:53	7439-96-5	
Nickel	**12.1**	mg/kg	4.4	5	07/29/11 14:32	08/01/11 22:53	7440-02-0	
Silver	**<2.2**	mg/kg	2.2	5	07/29/11 14:32	08/01/11 22:53	7440-22-4	
Zinc	**101**	mg/kg	4.4	5	07/29/11 14:32	08/01/11 22:53	7440-66-6	
7471 Mercury	Analytical Method: EPA 7471 Preparation Method: EPA 7471							
Mercury	**5.3**	mg/kg	0.24	10	08/01/11 09:52	08/03/11 14:29	7439-97-6	
Dry Weight	Analytical Method: % Moisture							
Percent Moisture	**18.1**	%	0.10	1		07/25/11 00:00		

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ANALYTICAL RESULTS

Project: BlackPine Mine
Pace Project No.: 10163437

Sample: CML-SD-30-00 **Lab ID: 10163437030** Collected: 07/13/11 09:20 Received: 07/15/11 09:25 Matrix: Solid

Results reported on a "dry-weight" basis

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
6010 MET ICP	Analytical Method: EPA 6010 Preparation Method: EPA 3050							
Antimony	**5.6**	mg/kg	2.5	5	07/29/11 14:32	08/01/11 22:59	7440-36-0	
Arsenic	**24.9**	mg/kg	2.5	5	07/29/11 14:32	08/01/11 22:59	7440-38-2	
Barium	**294**	mg/kg	2.5	5	07/29/11 14:32	08/01/11 22:59	7440-39-3	
Cadmium	**6.6**	mg/kg	0.25	5	07/29/11 14:32	08/01/11 22:59	7440-43-9	
Chromium	**15.1**	mg/kg	2.5	5	07/29/11 14:32	08/01/11 22:59	7440-47-3	
Copper	**1550**	mg/kg	2.5	5	07/29/11 14:32	08/01/11 22:59	7440-50-8	
Iron	**26500**	mg/kg	12.5	5	07/29/11 14:32	08/01/11 22:59	7439-89-6	
Lead	**81.8**	mg/kg	1.5	5	07/29/11 14:32	08/01/11 22:59	7439-92-1	
Manganese	**974**	mg/kg	1.2	5	07/29/11 14:32	08/01/11 22:59	7439-96-5	
Nickel	**12.9**	mg/kg	5.0	5	07/29/11 14:32	08/01/11 22:59	7440-02-0	
Silver	**<2.5**	mg/kg	2.5	5	07/29/11 14:32	08/01/11 22:59	7440-22-4	
Zinc	**232**	mg/kg	5.0	5	07/29/11 14:32	08/01/11 22:59	7440-66-6	
7471 Mercury	Analytical Method: EPA 7471 Preparation Method: EPA 7471							
Mercury	**9.6**	mg/kg	0.26	10	08/01/11 09:52	08/03/11 14:31	7439-97-6	
Dry Weight	Analytical Method: % Moisture							
Percent Moisture	**23.7**	%	0.10	1		07/25/11 00:00		

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ANALYTICAL RESULTS

Project: BlackPine Mine
Pace Project No.: 10163437

Sample: CML-SD-22-00 **Lab ID: 10163437031** Collected: 07/13/11 09:35 Received: 07/15/11 09:25 Matrix: Solid

Results reported on a "dry-weight" basis

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
6010 MET ICP	Analytical Method: EPA 6010 Preparation Method: EPA 3050							
Antimony	**28.5**	mg/kg	2.6	5	07/29/11 14:32	08/01/11 23:05	7440-36-0	
Arsenic	**58.2**	mg/kg	2.6	5	07/29/11 14:32	08/01/11 23:05	7440-38-2	
Barium	**153**	mg/kg	2.6	5	07/29/11 14:32	08/01/11 23:05	7440-39-3	
Cadmium	**2.1**	mg/kg	0.26	5	07/29/11 14:32	08/01/11 23:05	7440-43-9	
Chromium	**12.2**	mg/kg	2.6	5	07/29/11 14:32	08/01/11 23:05	7440-47-3	
Copper	**154**	mg/kg	2.6	5	07/29/11 14:32	08/01/11 23:05	7440-50-8	
Iron	**22800**	mg/kg	13.0	5	07/29/11 14:32	08/01/11 23:05	7439-89-6	
Lead	**186**	mg/kg	1.6	5	07/29/11 14:32	08/01/11 23:05	7439-92-1	
Manganese	**610**	mg/kg	1.3	5	07/29/11 14:32	08/01/11 23:05	7439-96-5	
Nickel	**7.7**	mg/kg	5.2	5	07/29/11 14:32	08/01/11 23:05	7440-02-0	
Silver	**<2.6**	mg/kg	2.6	5	07/29/11 14:32	08/01/11 23:05	7440-22-4	
Zinc	**118**	mg/kg	5.2	5	07/29/11 14:32	08/01/11 23:05	7440-66-6	
7471 Mercury	Analytical Method: EPA 7471 Preparation Method: EPA 7471							
Mercury	**1.6**	mg/kg	0.26	10	08/01/11 09:52	08/03/11 14:38	7439-97-6	
Dry Weight	Analytical Method: % Moisture							
Percent Moisture	**21.9**	%	0.10	1		07/25/11 00:00		

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ANALYTICAL RESULTS

Project: BlackPine Mine
Pace Project No.: 10163437

Sample: CML-SD-23-00 **Lab ID: 10163437032** Collected: 07/13/11 09:45 Received: 07/15/11 09:25 Matrix: Solid

Results reported on a "dry-weight" basis

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
6010 MET ICP	Analytical Method: EPA 6010 Preparation Method: EPA 3050							
Antimony	**40.9**	mg/kg	2.3	5	07/29/11 14:32	08/01/11 23:19	7440-36-0	
Arsenic	**61.6**	mg/kg	2.3	5	07/29/11 14:32	08/01/11 23:19	7440-38-2	
Barium	**190**	mg/kg	2.3	5	07/29/11 14:32	08/01/11 23:19	7440-39-3	
Cadmium	**2.4**	mg/kg	0.23	5	07/29/11 14:32	08/01/11 23:19	7440-43-9	
Chromium	**22.1**	mg/kg	2.3	5	07/29/11 14:32	08/01/11 23:19	7440-47-3	
Copper	**249**	mg/kg	2.3	5	07/29/11 14:32	08/01/11 23:19	7440-50-8	
Iron	**31600**	mg/kg	11.3	5	07/29/11 14:32	08/01/11 23:19	7439-89-6	
Lead	**282**	mg/kg	1.4	5	07/29/11 14:32	08/01/11 23:19	7439-92-1	
Manganese	**568**	mg/kg	1.1	5	07/29/11 14:32	08/01/11 23:19	7439-96-5	
Nickel	**10.5**	mg/kg	4.5	5	07/29/11 14:32	08/01/11 23:19	7440-02-0	
Silver	**<2.3**	mg/kg	2.3	5	07/29/11 14:32	08/01/11 23:19	7440-22-4	
Zinc	**92.4**	mg/kg	4.5	5	07/29/11 14:32	08/01/11 23:19	7440-66-6	
7471 Mercury	Analytical Method: EPA 7471 Preparation Method: EPA 7471							
Mercury	**5.8**	mg/kg	0.22	10	08/01/11 09:52	08/03/11 14:40	7439-97-6	
Dry Weight	Analytical Method: % Moisture							
Percent Moisture	**21.5**	%	0.10	1		07/25/11 00:00		

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ANALYTICAL RESULTS

Project: BlackPine Mine
Pace Project No.: 10163437

Sample: CML-SD-23-02 **Lab ID: 10163437033** Collected: 07/13/11 09:50 Received: 07/15/11 09:25 Matrix: Solid

Results reported on a "dry-weight" basis

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
6010 MET ICP	Analytical Method: EPA 6010 Preparation Method: EPA 3050							
Antimony	**38.0**	mg/kg	2.2	5	07/29/11 14:32	08/01/11 23:25	7440-36-0	
Arsenic	**48.4**	mg/kg	2.2	5	07/29/11 14:32	08/01/11 23:25	7440-38-2	
Barium	**218**	mg/kg	2.2	5	07/29/11 14:32	08/01/11 23:25	7440-39-3	
Cadmium	**3.1**	mg/kg	0.22	5	07/29/11 14:32	08/01/11 23:25	7440-43-9	
Chromium	**21.6**	mg/kg	2.2	5	07/29/11 14:32	08/01/11 23:25	7440-47-3	
Copper	**661**	mg/kg	2.2	5	07/29/11 14:32	08/01/11 23:25	7440-50-8	
Iron	**30800**	mg/kg	11.2	5	07/29/11 14:32	08/01/11 23:25	7439-89-6	
Lead	**300**	mg/kg	1.3	5	07/29/11 14:32	08/01/11 23:25	7439-92-1	
Manganese	**789**	mg/kg	1.1	5	07/29/11 14:32	08/01/11 23:25	7439-96-5	
Nickel	**10.5**	mg/kg	4.5	5	07/29/11 14:32	08/01/11 23:25	7440-02-0	
Silver	**<2.2**	mg/kg	2.2	5	07/29/11 14:32	08/01/11 23:25	7440-22-4	
Zinc	**108**	mg/kg	4.5	5	07/29/11 14:32	08/01/11 23:25	7440-66-6	
7471 Mercury	Analytical Method: EPA 7471 Preparation Method: EPA 7471							
Mercury	**2.9**	mg/kg	0.24	10	08/01/11 09:52	08/03/11 15:00	7439-97-6	
Dry Weight	Analytical Method: % Moisture							
Percent Moisture	**18.4**	%	0.10	1		07/25/11 00:00		

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ANALYTICAL RESULTS

Project: BlackPine Mine
Pace Project No.: 10163437

Sample: CML-SD-19-00 **Lab ID: 10163437034** Collected: 07/13/11 10:10 Received: 07/15/11 09:25 Matrix: Solid

Results reported on a "dry-weight" basis

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
6010 MET ICP	Analytical Method: EPA 6010 Preparation Method: EPA 3050							
Antimony	**614**	mg/kg	2.8	5	07/29/11 14:32	08/01/11 23:31	7440-36-0	
Arsenic	**442**	mg/kg	2.8	5	07/29/11 14:32	08/01/11 23:31	7440-38-2	
Barium	**238**	mg/kg	2.8	5	07/29/11 14:32	08/01/11 23:31	7440-39-3	
Cadmium	**15.4**	mg/kg	0.28	5	07/29/11 14:32	08/01/11 23:31	7440-43-9	
Chromium	**<2.8**	mg/kg	2.8	5	07/29/11 14:32	08/01/11 23:31	7440-47-3	
Copper	**727**	mg/kg	2.8	5	07/29/11 14:32	08/01/11 23:31	7440-50-8	
Iron	**11900**	mg/kg	13.8	5	07/29/11 14:32	08/01/11 23:31	7439-89-6	
Lead	**2560**	mg/kg	1.7	5	07/29/11 14:32	08/01/11 23:31	7439-92-1	
Manganese	**264**	mg/kg	1.4	5	07/29/11 14:32	08/01/11 23:31	7439-96-5	
Nickel	**<5.5**	mg/kg	5.5	5	07/29/11 14:32	08/01/11 23:31	7440-02-0	
Silver	**47.0**	mg/kg	2.8	5	07/29/11 14:32	08/01/11 23:31	7440-22-4	
Zinc	**238**	mg/kg	5.5	5	07/29/11 14:32	08/01/11 23:31	7440-66-6	
7471 Mercury	Analytical Method: EPA 7471 Preparation Method: EPA 7471							
Mercury	**2.8**	mg/kg	0.21	10	08/01/11 09:52	08/03/11 15:02	7439-97-6	
Dry Weight	Analytical Method: % Moisture							
Percent Moisture	**9.2**	%	0.10	1		07/25/11 00:00		

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ANALYTICAL RESULTS

Project: BlackPine Mine
Pace Project No.: 10163437

Sample: CML-SD-19-02 **Lab ID: 10163437035** Collected: 07/13/11 10:15 Received: 07/15/11 09:25 Matrix: Solid

Results reported on a "dry-weight" basis

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
6010 MET ICP	Analytical Method: EPA 6010 Preparation Method: EPA 3050							
Antimony	**21.1**	mg/kg	2.4	5	07/29/11 14:32	08/01/11 23:37	7440-36-0	
Arsenic	**43.6**	mg/kg	2.4	5	07/29/11 14:32	08/01/11 23:37	7440-38-2	
Barium	**317**	mg/kg	2.4	5	07/29/11 14:32	08/01/11 23:37	7440-39-3	
Cadmium	**6.8**	mg/kg	0.24	5	07/29/11 14:32	08/01/11 23:37	7440-43-9	
Chromium	**16.8**	mg/kg	2.4	5	07/29/11 14:32	08/01/11 23:37	7440-47-3	
Copper	**361**	mg/kg	2.4	5	07/29/11 14:32	08/01/11 23:37	7440-50-8	
Iron	**26900**	mg/kg	11.9	5	07/29/11 14:32	08/01/11 23:37	7439-89-6	
Lead	**197**	mg/kg	1.4	5	07/29/11 14:32	08/01/11 23:37	7439-92-1	
Manganese	**920**	mg/kg	1.2	5	07/29/11 14:32	08/01/11 23:37	7439-96-5	
Nickel	**19.5**	mg/kg	4.8	5	07/29/11 14:32	08/01/11 23:37	7440-02-0	
Silver	**2.7**	mg/kg	2.4	5	07/29/11 14:32	08/01/11 23:37	7440-22-4	
Zinc	**339**	mg/kg	4.8	5	07/29/11 14:32	08/01/11 23:37	7440-66-6	
7471 Mercury	Analytical Method: EPA 7471 Preparation Method: EPA 7471							
Mercury	**3.4**	mg/kg	0.27	10	08/01/11 09:52	08/03/11 15:05	7439-97-6	
Dry Weight	Analytical Method: % Moisture							
Percent Moisture	**25.4**	%	0.10	1		07/25/11 00:00		

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ANALYTICAL RESULTS

Project: BlackPine Mine
Pace Project No.: 10163437

Sample: CML-SD-18-00 **Lab ID: 10163437036** Collected: 07/13/11 10:20 Received: 07/15/11 09:25 Matrix: Solid

Results reported on a "dry-weight" basis

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
6010 MET ICP	Analytical Method: EPA 6010 Preparation Method: EPA 3050							
Antimony	**76.1**	mg/kg	3.6	5	07/29/11 14:32	08/01/11 23:43	7440-36-0	
Arsenic	**211**	mg/kg	3.6	5	07/29/11 14:32	08/01/11 23:43	7440-38-2	M1
Barium	**793**	mg/kg	3.6	5	07/29/11 14:32	08/01/11 23:43	7440-39-3	M1
Cadmium	**14.8**	mg/kg	0.36	5	07/29/11 14:32	08/01/11 23:43	7440-43-9	
Chromium	**18.5**	mg/kg	3.6	5	07/29/11 14:32	08/01/11 23:43	7440-47-3	
Copper	**1070**	mg/kg	3.6	5	07/29/11 14:32	08/01/11 23:43	7440-50-8	M1
Iron	**29700**	mg/kg	17.9	5	07/29/11 14:32	08/01/11 23:43	7439-89-6	P6
Lead	**663**	mg/kg	2.1	5	07/29/11 14:32	08/01/11 23:43	7439-92-1	M1
Manganese	**1640**	mg/kg	1.8	5	07/29/11 14:32	08/01/11 23:43	7439-96-5	M1
Nickel	**24.1**	mg/kg	7.2	5	07/29/11 14:32	08/01/11 23:43	7440-02-0	
Silver	**16.6**	mg/kg	3.6	5	07/29/11 14:32	08/01/11 23:43	7440-22-4	
Zinc	**479**	mg/kg	7.2	5	07/29/11 14:32	08/01/11 23:43	7440-66-6	M1
7471 Mercury	Analytical Method: EPA 7471 Preparation Method: EPA 7471							
Mercury	**11.6**	mg/kg	0.43	10	08/01/11 09:52	08/03/11 15:13	7439-97-6	M6
Dry Weight	Analytical Method: % Moisture							
Percent Moisture	**53.2**	%	0.10	1		07/25/11 00:00		

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QUALITY CONTROL DATA

Project: BlackPine Mine
Pace Project No.: 10163437

QC Batch: MPRP/27174 Analysis Method: EPA 6010
QC Batch Method: EPA 3050 Analysis Description: 6010 MET
Associated Lab Samples: 10163437001, 10163437002, 10163437003, 10163437004, 10163437005, 10163437006, 10163437007, 10163437008, 10163437009, 10163437010, 10163437011, 10163437012, 10163437013, 10163437014, 10163437015, 10163437016, 10163437017, 10163437018, 10163437019, 10163437020

METHOD BLANK: 1014888 Matrix: Solid
Associated Lab Samples: 10163437001, 10163437002, 10163437003, 10163437004, 10163437005, 10163437006, 10163437007, 10163437008, 10163437009, 10163437010, 10163437011, 10163437012, 10163437013, 10163437014, 10163437015, 10163437016, 10163437017, 10163437018, 10163437019, 10163437020

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Antimony	mg/kg	<0.50	0.50	08/01/11 17:23	
Arsenic	mg/kg	<0.50	0.50	08/01/11 17:23	
Barium	mg/kg	<0.50	0.50	08/01/11 17:23	
Cadmium	mg/kg	<0.050	0.050	08/01/11 17:23	
Chromium	mg/kg	<0.50	0.50	08/01/11 17:23	
Copper	mg/kg	<0.50	0.50	08/01/11 17:23	
Iron	mg/kg	3.1	2.5	08/01/11 17:23	
Lead	mg/kg	<0.30	0.30	08/01/11 17:23	
Manganese	mg/kg	<0.25	0.25	08/01/11 17:23	
Nickel	mg/kg	<1.0	1.0	08/01/11 17:23	
Silver	mg/kg	<0.50	0.50	08/01/11 17:23	
Zinc	mg/kg	<1.0	1.0	08/01/11 17:23	

LABORATORY CONTROL SAMPLE: 1014889

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Antimony	mg/kg	47.2	44.7	95	80-120	
Arsenic	mg/kg	47.2	43.2	92	80-120	
Barium	mg/kg	47.2	45.4	96	80-120	
Cadmium	mg/kg	47.2	43.1	91	80-120	
Chromium	mg/kg	47.2	45.3	96	80-120	
Copper	mg/kg	47.2	45.3	96	80-120	
Iron	mg/kg	472	509	108	80-120	
Lead	mg/kg	47.2	44.6	95	80-120	
Manganese	mg/kg	47.2	45.7	97	80-120	
Nickel	mg/kg	47.2	44.4	94	80-120	
Silver	mg/kg	23.6	22.2	94	80-120	
Zinc	mg/kg	47.2	44.8	95	80-120	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 1014890 1014891

Parameter	Units	10163437001 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Antimony	mg/kg	2.8	50.8	55.3	27.1	29.2	48	48	75-125	7	30	M1
Arsenic	mg/kg	7.8	50.8	55.3	58.2	61.6	99	97	75-125	6	30	
Barium	mg/kg	285	50.8	55.3	405	393	235	195	75-125	3	30	M1

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QUALITY CONTROL DATA

Project: BlackPine Mine
Pace Project No.: 10163437

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 1014890 1014891

Parameter	Units	10163437001 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Cadmium	mg/kg	1.1	50.8	55.3	48.0	52.5	92	93	75-125	9	30	
Chromium	mg/kg	8.4	50.8	55.3	58.2	62.8	98	98	75-125	8	30	
Copper	mg/kg	42.5	50.8	55.3	103	101	120	105	75-125	3	30	
Iron	mg/kg	9690	508	553	11800	12000	414	424	75-125	2	30	P6
Lead	mg/kg	37.5	50.8	55.3	103	96.3	130	106	75-125	7	30	M1
Manganese	mg/kg	739	50.8	55.3	620	771	-234	59	75-125	22	30	M1
Nickel	mg/kg	11.0	50.8	55.3	65.6	65.4	108	98	75-125	.2	30	
Silver	mg/kg	<2.5	25.3	27.7	24.7	27.0	96	96	75-125	9	30	
Zinc	mg/kg	78.3	50.8	55.3	146	138	134	108	75-125	6	30	M1

MATRIX SPIKE SAMPLE: 1014892

Parameter	Units	10163437020 Result	Spike Conc.	MS Result	MS % Rec	% Rec Limits	Qualifiers
Antimony	mg/kg	95.0	46.5	97.2	5	75-125	M1
Arsenic	mg/kg	109	46.5	147	82	75-125	
Barium	mg/kg	371	46.5	442	155	75-125	M1
Cadmium	mg/kg	6.5	46.5	47.3	88	75-125	
Chromium	mg/kg	10.0	46.5	52.0	90	75-125	
Copper	mg/kg	500	46.5	567	144	75-125	M1
Iron	mg/kg	16500	465	17900	283	75-125	P6
Lead	mg/kg	617	46.5	637	43	75-125	M1
Manganese	mg/kg	1190	46.5	1250	118	75-125	
Nickel	mg/kg	10.4	46.5	52.6	91	75-125	
Silver	mg/kg	7.3	23.2	28.3	91	75-125	
Zinc	mg/kg	269	46.5	334	141	75-125	M1

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QUALITY CONTROL DATA

Project: BlackPine Mine
Pace Project No.: 10163437

QC Batch: MPRP/27175 Analysis Method: EPA 6010
QC Batch Method: EPA 3050 Analysis Description: 6010 MET
Associated Lab Samples: 10163437021, 10163437022, 10163437023, 10163437024, 10163437025, 10163437026, 10163437027, 10163437028, 10163437029, 10163437030, 10163437031, 10163437032, 10163437033, 10163437034, 10163437035, 10163437036

METHOD BLANK: 1014893 Matrix: Solid
Associated Lab Samples: 10163437021, 10163437022, 10163437023, 10163437024, 10163437025, 10163437026, 10163437027, 10163437028, 10163437029, 10163437030, 10163437031, 10163437032, 10163437033, 10163437034, 10163437035, 10163437036

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Antimony	mg/kg	<0.48	0.48	08/01/11 21:28	
Arsenic	mg/kg	<0.48	0.48	08/01/11 21:28	
Barium	mg/kg	<0.48	0.48	08/01/11 21:28	
Cadmium	mg/kg	<0.048	0.048	08/01/11 21:28	
Chromium	mg/kg	<0.48	0.48	08/01/11 21:28	
Copper	mg/kg	<0.48	0.48	08/01/11 21:28	
Iron	mg/kg	2.9	2.4	08/01/11 21:28	
Lead	mg/kg	<0.29	0.29	08/01/11 21:28	
Manganese	mg/kg	<0.24	0.24	08/01/11 21:28	
Nickel	mg/kg	<0.95	0.95	08/01/11 21:28	
Silver	mg/kg	<0.48	0.48	08/01/11 21:28	
Zinc	mg/kg	<0.95	0.95	08/01/11 21:28	

LABORATORY CONTROL SAMPLE: 1014894

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Antimony	mg/kg	48.5	45.8	94	80-120	
Arsenic	mg/kg	48.5	43.9	90	80-120	
Barium	mg/kg	48.5	46.1	95	80-120	
Cadmium	mg/kg	48.5	43.6	90	80-120	
Chromium	mg/kg	48.5	46.1	95	80-120	
Copper	mg/kg	48.5	46.2	95	80-120	
Iron	mg/kg	485	528	109	80-120	
Lead	mg/kg	48.5	45.2	93	80-120	
Manganese	mg/kg	48.5	46.4	96	80-120	
Nickel	mg/kg	48.5	45.0	93	80-120	
Silver	mg/kg	24.3	22.4	92	80-120	
Zinc	mg/kg	48.5	44.7	92	80-120	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 1014895 1014896

Parameter	Units	10163437021 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Antimony	mg/kg	24.0	53.4	64.6	46.0	54.8	41	48	75-125	17	30	M1
Arsenic	mg/kg	30.5	53.4	64.6	79.4	96.8	92	103	75-125	20	30	
Barium	mg/kg	425	53.4	64.6	431	455	13	47	75-125	5	30	M1

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QUALITY CONTROL DATA

Project: BlackPine Mine
Pace Project No.: 10163437

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 1014895 1014896

Parameter	Units	10163437021 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Cadmium	mg/kg	13.8	53.4	64.6	61.3	72.1	89	90	75-125	16	30	
Chromium	mg/kg	16.3	53.4	64.6	70.4	76.7	101	93	75-125	9	30	
Copper	mg/kg	1390	53.4	64.6	1370	1470	-24	125	75-125	7	30	M1
Iron	mg/kg	23200	534	646	24100	23800	167	104	75-125	.9	30	P6
Lead	mg/kg	182	53.4	64.6	228	278	87	149	75-125	20	30	M1
Manganese	mg/kg	2050	53.4	64.6	1680	1990	-692	-93	75-125	17	30	M1,P6
Nickel	mg/kg	22.5	53.4	64.6	74.5	81.5	97	91	75-125	9	30	
Silver	mg/kg	<2.9	26.8	32.3	27.0	31.4	95	92	75-125	15	30	
Zinc	mg/kg	328	53.4	64.6	378	414	94	133	75-125	9	30	M1

MATRIX SPIKE SAMPLE: 1014897

Parameter	Units	10163437036 Result	Spike Conc.	MS Result	MS % Rec	% Rec Limits	Qualifiers
Antimony	mg/kg	76.1	97.1	161	88	75-125	
Arsenic	mg/kg	211	97.1	352	145	75-125	M1
Barium	mg/kg	793	97.1	932	143	75-125	M1
Cadmium	mg/kg	14.8	97.1	107	95	75-125	
Chromium	mg/kg	18.5	97.1	112	97	75-125	
Copper	mg/kg	1070	97.1	1330	268	75-125	M1
Iron	mg/kg	29700	971	31200	159	75-125	P6
Lead	mg/kg	663	97.1	1020	363	75-125	M1
Manganese	mg/kg	1640	97.1	2090	457	75-125	M1
Nickel	mg/kg	24.1	97.1	115	94	75-125	
Silver	mg/kg	16.6	48.5	66.9	104	75-125	
Zinc	mg/kg	479	97.1	646	172	75-125	M1

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QUALITY CONTROL DATA

Project: BlackPine Mine
Pace Project No.: 10163437

QC Batch: MERP/5637 Analysis Method: EPA 7471
QC Batch Method: EPA 7471 Analysis Description: 7471 Mercury
Associated Lab Samples: 10163437001, 10163437002, 10163437003, 10163437004, 10163437005, 10163437006, 10163437007, 10163437008, 10163437009, 10163437010, 10163437011, 10163437012, 10163437013, 10163437014, 10163437015, 10163437016, 10163437017, 10163437018, 10163437019, 10163437020

METHOD BLANK: 1015384 Matrix: Solid
Associated Lab Samples: 10163437001, 10163437002, 10163437003, 10163437004, 10163437005, 10163437006, 10163437007, 10163437008, 10163437009, 10163437010, 10163437011, 10163437012, 10163437013, 10163437014, 10163437015, 10163437016, 10163437017, 10163437018, 10163437019, 10163437020

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Mercury	mg/kg	<0.019	0.019	08/04/11 07:16	

LABORATORY CONTROL SAMPLE: 1015385

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Mercury	mg/kg	.5	0.50	101	80-120	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 1015386 1015387

Parameter	Units	10163437001 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Mercury	mg/kg	1.1	.64	.67	0.86	0.93	-44	-33	80-120	7	20	M6

MATRIX SPIKE SAMPLE: 1015388

Parameter	Units	10163437020 Result	Spike Conc.	MS Result	MS % Rec	% Rec Limits	Qualifiers
Mercury	mg/kg	4.9	.55	7.6	493	80-120	M6

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QUALITY CONTROL DATA

Project: BlackPine Mine
Pace Project No.: 10163437

QC Batch: MERP/5638 Analysis Method: EPA 7471
QC Batch Method: EPA 7471 Analysis Description: 7471 Mercury
Associated Lab Samples: 10163437021, 10163437022, 10163437023, 10163437024, 10163437025, 10163437026, 10163437027, 10163437028, 10163437029, 10163437030, 10163437031, 10163437032, 10163437033, 10163437034, 10163437035, 10163437036

METHOD BLANK: 1015391 Matrix: Solid
Associated Lab Samples: 10163437021, 10163437022, 10163437023, 10163437024, 10163437025, 10163437026, 10163437027, 10163437028, 10163437029, 10163437030, 10163437031, 10163437032, 10163437033, 10163437034, 10163437035, 10163437036

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Mercury	mg/kg	<0.020	0.020	08/03/11 13:19	

LABORATORY CONTROL SAMPLE: 1015392

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Mercury	mg/kg	.5	0.50	101	80-120	

MATRIX SPIKE SAMPLE: 1015395

Parameter	Units	10163437036 Result	Spike Conc.	MS Result	MS % Rec	% Rec Limits	Qualifiers
Mercury	mg/kg	11.6	1	12.0	42	80-120	M6

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 1024027 1024028

Parameter	Units	10163437021 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Mercury	mg/kg	5.6	.62	.61	3.9	5.6	-285	-8	80-120	37	20	D6,M6

REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL DATA

Project: BlackPine Mine
Pace Project No.: 10163437

QC Batch: MPRP/27307 Analysis Method: % Moisture
QC Batch Method: % Moisture Analysis Description: Dry Weight/Percent Moisture
Associated Lab Samples: 10163437001, 10163437002, 10163437003, 10163437004, 10163437005, 10163437006, 10163437007, 10163437008, 10163437009, 10163437010, 10163437011, 10163437012, 10163437013, 10163437014

SAMPLE DUPLICATE: 1019547

Parameter	Units	10163645009 Result	Dup Result	RPD	Max RPD	Qualifiers
Percent Moisture	%	14.3	15.0	5	30	

SAMPLE DUPLICATE: 1019548

Parameter	Units	10163437014 Result	Dup Result	RPD	Max RPD	Qualifiers
Percent Moisture	%	29.7	28.2	5	30	

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QUALITY CONTROL DATA

Project: BlackPine Mine
Pace Project No.: 10163437

QC Batch: MPRP/27310 Analysis Method: % Moisture
QC Batch Method: % Moisture Analysis Description: Dry Weight/Percent Moisture
Associated Lab Samples: 10163437015, 10163437016, 10163437017, 10163437018, 10163437019, 10163437020, 10163437021, 10163437022, 10163437023, 10163437024, 10163437025, 10163437026, 10163437027, 10163437028, 10163437029, 10163437030, 10163437031, 10163437032, 10163437033, 10163437034

SAMPLE DUPLICATE: 1019641

Parameter	Units	10163437015 Result	Dup Result	RPD	Max RPD	Qualifiers
Percent Moisture	%	14.2	12.2	15	30	

SAMPLE DUPLICATE: 1019642

Parameter	Units	10163437034 Result	Dup Result	RPD	Max RPD	Qualifiers
Percent Moisture	%	9.2	7.5	20	30	

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QUALITY CONTROL DATA

Project: BlackPine Mine
Pace Project No.: 10163437

QC Batch: MPRP/27315
QC Batch Method: % Moisture
Analysis Method: % Moisture
Analysis Description: Dry Weight/Percent Moisture
Associated Lab Samples: 10163437035, 10163437036

SAMPLE DUPLICATE: 1019708

Parameter	Units	10164017001 Result	Dup Result	RPD	Max RPD	Qualifiers
Percent Moisture	%	4.3	4.3	1	30	

SAMPLE DUPLICATE: 1019709

Parameter	Units	10163630018 Result	Dup Result	RPD	Max RPD	Qualifiers
Percent Moisture	%	39.4	39.2	.4	30	

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QUALIFIERS

Project: BlackPine Mine
Pace Project No.: 10163437

DEFINITIONS

DF - Dilution Factor, if reported, represents the factor applied to the reported data due to changes in sample preparation, dilution of the sample aliquot, or moisture content.

ND - Not Detected at or above adjusted reporting limit.

J - Estimated concentration above the adjusted method detection limit and below the adjusted reporting limit.

MDL - Adjusted Method Detection Limit.

S - Surrogate

1,2-Diphenylhydrazine (8270 listed analyte) decomposes to Azobenzene.

Consistent with EPA guidelines, unrounded data are displayed and have been used to calculate % recovery and RPD values.

LCS(D) - Laboratory Control Sample (Duplicate)

MS(D) - Matrix Spike (Duplicate)

DUP - Sample Duplicate

RPD - Relative Percent Difference

NC - Not Calculable.

SG - Silica Gel - Clean-Up

U - Indicates the compound was analyzed for, but not detected.

N-Nitrosodiphenylamine decomposes and cannot be separated from Diphenylamine using Method 8270. The result reported for each analyte is a combined concentration.

LABORATORIES

PASI-M	Pace Analytical Services - Minneapolis

ANALYTE QUALIFIERS

D6	The relative percent difference (RPD) between the sample and sample duplicate exceeded laboratory control limits.
M1	Matrix spike recovery exceeded QC limits. Batch accepted based on laboratory control sample (LCS) recovery.
M6	Matrix spike and Matrix spike duplicate recovery not evaluated against control limits due to sample dilution.
P6	Matrix spike recovery was outside laboratory control limits due to a parent sample concentration notably higher than the spike level.

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QUALITY CONTROL DATA CROSS REFERENCE TABLE

Project: BlackPine Mine
Pace Project No.: 10163437

Lab ID	Sample ID	QC Batch Method	QC Batch	Analytical Method	Analytical Batch
10163437001	**CML-SD-45**	EPA 3050	MPRP/27174	EPA 6010	ICP/11627
10163437002	**CML-SD-43**	EPA 3050	MPRP/27174	EPA 6010	ICP/11627
10163437003	**CML-SD-40**	EPA 3050	MPRP/27174	EPA 6010	ICP/11627
10163437004	**CML-SD-37**	EPA 3050	MPRP/27174	EPA 6010	ICP/11627
10163437005	**CML-SD-36**	EPA 3050	MPRP/27174	EPA 6010	ICP/11627
10163437006	**CML-SD-34**	EPA 3050	MPRP/27174	EPA 6010	ICP/11627
10163437007	**CML-SD-35**	EPA 3050	MPRP/27174	EPA 6010	ICP/11627
10163437008	**CML-SD-38**	EPA 3050	MPRP/27174	EPA 6010	ICP/11627
10163437009	**CML-SD-41**	EPA 3050	MPRP/27174	EPA 6010	ICP/11627
10163437010	**CML-SD-44**	EPA 3050	MPRP/27174	EPA 6010	ICP/11627
10163437011	**CML-SD-46**	EPA 3050	MPRP/27174	EPA 6010	ICP/11627
10163437012	**CML-SD-33-00**	EPA 3050	MPRP/27174	EPA 6010	ICP/11627
10163437013	**CML-SD-33-01**	EPA 3050	MPRP/27174	EPA 6010	ICP/11627
10163437014	**CML-SD-32-00**	EPA 3050	MPRP/27174	EPA 6010	ICP/11627
10163437015	**CML-SD-31-00**	EPA 3050	MPRP/27174	EPA 6010	ICP/11627
10163437016	**CML-SD-31-02**	EPA 3050	MPRP/27174	EPA 6010	ICP/11627
10163437017	**CML-SD-29-00**	EPA 3050	MPRP/27174	EPA 6010	ICP/11627
10163437018	**CML-SD-28-00**	EPA 3050	MPRP/27174	EPA 6010	ICP/11627
10163437019	**CML-SD-27-00**	EPA 3050	MPRP/27174	EPA 6010	ICP/11627
10163437020	**CML-SD-24-00**	EPA 3050	MPRP/27174	EPA 6010	ICP/11627
10163437021	**CML-SD-24-01**	EPA 3050	MPRP/27175	EPA 6010	ICP/11631
10163437022	**CML-SD-25-00**	EPA 3050	MPRP/27175	EPA 6010	ICP/11631
10163437023	**CML-SD-26-00**	EPA 3050	MPRP/27175	EPA 6010	ICP/11631
10163437024	**CML-SD-21-00**	EPA 3050	MPRP/27175	EPA 6010	ICP/11631
10163437025	**CML-SD-20-00**	EPA 3050	MPRP/27175	EPA 6010	ICP/11631
10163437026	**CML-SD-20-02**	EPA 3050	MPRP/27175	EPA 6010	ICP/11631
10163437027	**CML-SD-42-00**	EPA 3050	MPRP/27175	EPA 6010	ICP/11631
10163437028	**CML-SD-42-02**	EPA 3050	MPRP/27175	EPA 6010	ICP/11631
10163437029	**CML-SD-39-00**	EPA 3050	MPRP/27175	EPA 6010	ICP/11631
10163437030	**CML-SD-30-00**	EPA 3050	MPRP/27175	EPA 6010	ICP/11631
10163437031	**CML-SD-22-00**	EPA 3050	MPRP/27175	EPA 6010	ICP/11631
10163437032	**CML-SD-23-00**	EPA 3050	MPRP/27175	EPA 6010	ICP/11631
10163437033	**CML-SD-23-02**	EPA 3050	MPRP/27175	EPA 6010	ICP/11631
10163437034	**CML-SD-19-00**	EPA 3050	MPRP/27175	EPA 6010	ICP/11631
10163437035	**CML-SD-19-02**	EPA 3050	MPRP/27175	EPA 6010	ICP/11631
10163437036	**CML-SD-18-00**	EPA 3050	MPRP/27175	EPA 6010	ICP/11631
10163437001	**CML-SD-45**	EPA 7471	MERP/5637	EPA 7471	MERC/6517
10163437002	**CML-SD-43**	EPA 7471	MERP/5637	EPA 7471	MERC/6517
10163437003	**CML-SD-40**	EPA 7471	MERP/5637	EPA 7471	MERC/6517
10163437004	**CML-SD-37**	EPA 7471	MERP/5637	EPA 7471	MERC/6517
10163437005	**CML-SD-36**	EPA 7471	MERP/5637	EPA 7471	MERC/6517
10163437006	**CML-SD-34**	EPA 7471	MERP/5637	EPA 7471	MERC/6517
10163437007	**CML-SD-35**	EPA 7471	MERP/5637	EPA 7471	MERC/6517
10163437008	**CML-SD-38**	EPA 7471	MERP/5637	EPA 7471	MERC/6517
10163437009	**CML-SD-41**	EPA 7471	MERP/5637	EPA 7471	MERC/6517
10163437010	**CML-SD-44**	EPA 7471	MERP/5637	EPA 7471	MERC/6517
10163437011	**CML-SD-46**	EPA 7471	MERP/5637	EPA 7471	MERC/6517
10163437012	**CML-SD-33-00**	EPA 7471	MERP/5637	EPA 7471	MERC/6517

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QUALITY CONTROL DATA CROSS REFERENCE TABLE

Project: BlackPine Mine
Pace Project No.: 10163437

Lab ID	Sample ID	QC Batch Method	QC Batch	Analytical Method	Analytical Batch
10163437013	**CML-SD-33-01**	EPA 7471	MERP/5637	EPA 7471	MERC/6517
10163437014	**CML-SD-32-00**	EPA 7471	MERP/5637	EPA 7471	MERC/6517
10163437015	**CML-SD-31-00**	EPA 7471	MERP/5637	EPA 7471	MERC/6517
10163437016	**CML-SD-31-02**	EPA 7471	MERP/5637	EPA 7471	MERC/6517
10163437017	**CML-SD-29-00**	EPA 7471	MERP/5637	EPA 7471	MERC/6517
10163437018	**CML-SD-28-00**	EPA 7471	MERP/5637	EPA 7471	MERC/6517
10163437019	**CML-SD-27-00**	EPA 7471	MERP/5637	EPA 7471	MERC/6517
10163437020	**CML-SD-24-00**	EPA 7471	MERP/5637	EPA 7471	MERC/6517
10163437021	**CML-SD-24-01**	EPA 7471	MERP/5638	EPA 7471	MERC/6504
10163437022	**CML-SD-25-00**	EPA 7471	MERP/5638	EPA 7471	MERC/6504
10163437023	**CML-SD-26-00**	EPA 7471	MERP/5638	EPA 7471	MERC/6504
10163437024	**CML-SD-21-00**	EPA 7471	MERP/5638	EPA 7471	MERC/6504
10163437025	**CML-SD-20-00**	EPA 7471	MERP/5638	EPA 7471	MERC/6504
10163437026	**CML-SD-20-02**	EPA 7471	MERP/5638	EPA 7471	MERC/6504
10163437027	**CML-SD-42-00**	EPA 7471	MERP/5638	EPA 7471	MERC/6504
10163437028	**CML-SD-42-02**	EPA 7471	MERP/5638	EPA 7471	MERC/6504
10163437029	**CML-SD-39-00**	EPA 7471	MERP/5638	EPA 7471	MERC/6504
10163437030	**CML-SD-30-00**	EPA 7471	MERP/5638	EPA 7471	MERC/6504
10163437031	**CML-SD-22-00**	EPA 7471	MERP/5638	EPA 7471	MERC/6504
10163437032	**CML-SD-23-00**	EPA 7471	MERP/5638	EPA 7471	MERC/6504
10163437033	**CML-SD-23-02**	EPA 7471	MERP/5638	EPA 7471	MERC/6504
10163437034	**CML-SD-19-00**	EPA 7471	MERP/5638	EPA 7471	MERC/6504
10163437035	**CML-SD-19-02**	EPA 7471	MERP/5638	EPA 7471	MERC/6504
10163437036	**CML-SD-18-00**	EPA 7471	MERP/5638	EPA 7471	MERC/6504
10163437001	**CML-SD-45**	% Moisture	MPRP/27307		
10163437002	**CML-SD-43**	% Moisture	MPRP/27307		
10163437003	**CML-SD-40**	% Moisture	MPRP/27307		
10163437004	**CML-SD-37**	% Moisture	MPRP/27307		
10163437005	**CML-SD-36**	% Moisture	MPRP/27307		
10163437006	**CML-SD-34**	% Moisture	MPRP/27307		
10163437007	**CML-SD-35**	% Moisture	MPRP/27307		
10163437008	**CML-SD-38**	% Moisture	MPRP/27307		
10163437009	**CML-SD-41**	% Moisture	MPRP/27307		
10163437010	**CML-SD-44**	% Moisture	MPRP/27307		
10163437011	**CML-SD-46**	% Moisture	MPRP/27307		
10163437012	**CML-SD-33-00**	% Moisture	MPRP/27307		
10163437013	**CML-SD-33-01**	% Moisture	MPRP/27307		
10163437014	**CML-SD-32-00**	% Moisture	MPRP/27307		
10163437015	**CML-SD-31-00**	% Moisture	MPRP/27310		
10163437016	**CML-SD-31-02**	% Moisture	MPRP/27310		
10163437017	**CML-SD-29-00**	% Moisture	MPRP/27310		
10163437018	**CML-SD-28-00**	% Moisture	MPRP/27310		
10163437019	**CML-SD-27-00**	% Moisture	MPRP/27310		
10163437020	**CML-SD-24-00**	% Moisture	MPRP/27310		
10163437021	**CML-SD-24-01**	% Moisture	MPRP/27310		
10163437022	**CML-SD-25-00**	% Moisture	MPRP/27310		
10163437023	**CML-SD-26-00**	% Moisture	MPRP/27310		

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QUALITY CONTROL DATA CROSS REFERENCE TABLE

Project: BlackPine Mine
Pace Project No.: 10163437

Lab ID	Sample ID	QC Batch Method	QC Batch	Analytical Method	Analytical Batch
10163437024	**CML-SD-21-00**	% Moisture	MPRP/27310		
10163437025	**CML-SD-20-00**	% Moisture	MPRP/27310		
10163437026	**CML-SD-20-02**	% Moisture	MPRP/27310		
10163437027	**CML-SD-42-00**	% Moisture	MPRP/27310		
10163437028	**CML-SD-42-02**	% Moisture	MPRP/27310		
10163437029	**CML-SD-39-00**	% Moisture	MPRP/27310		
10163437030	**CML-SD-30-00**	% Moisture	MPRP/27310		
10163437031	**CML-SD-22-00**	% Moisture	MPRP/27310		
10163437032	**CML-SD-23-00**	% Moisture	MPRP/27310		
10163437033	**CML-SD-23-02**	% Moisture	MPRP/27310		
10163437034	**CML-SD-19-00**	% Moisture	MPRP/27310		
10163437035	**CML-SD-19-02**	% Moisture	MPRP/27315		
10163437036	**CML-SD-18-00**	% Moisture	MPRP/27315		

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CHAIN-OF-CUSTODY / Analytical Request Document

The Chain-of-Custody is a LEGAL DOCUMENT. All relevant fields must be completed accurately.

Page: 1 of 3

1321667

Section A Required Client Information:	Section B Required Project Information:	Section C Invoice Information:
Company: Herrera	Report To: Reyon Houck	Attention:
Address:	Copy To: Mark Donner	Company Name:
		Address:
Email To:	Purchase Order No.:	Pace Quote Reference:
Phone: Fax:	Project Name:	Pace Project Manager:
Requested Due Date/TAT:	Project Number:	Pace Profile #:

REGULATORY AGENCY

☐ NPDES ☐ GROUND WATER ☐ DRINKING WATER

☐ UST ☐ RCRA ☐ OTHER _____

Site Location STATE: _____

Section D Required Client Information

SAMPLE ID
(A-Z, 0-9 / ,-)
Sample IDs MUST BE UNIQUE

Matrix Codes — MATRIX / CODE

Drinking Water	DW
Water	WT
Waste Water	WW
Product	P
Soil/Solid	SL
Oil	OL
Wipe	WP
Air	AR
Tissue	TS
Other	OT

Requested Analysis Filtered (Y/N)

ITEM #	SAMPLE ID	MATRIX CODE (see valid codes to left)	SAMPLE TYPE (G=GRAB C=COMP)	COLLECTED: COMPOSITE START DATE	COLLECTED: COMPOSITE START TIME	COLLECTED: COMPOSITE END/GRAB DATE	COLLECTED: COMPOSITE END/GRAB TIME	SAMPLE TEMP AT COLLECTION	# OF CONTAINERS	Preservatives: Unpreserved	Preservatives: H_2SO_4	Preservatives: HNO_3	Preservatives: HCl	Preservatives: NaOH	Preservatives: $Na_2S_2O_3$	Preservatives: Methanol	Preservatives: Other	Y/N	Analysis Test ↓	Total Metals	Residual Chlorine (Y/N)	Pace Project No./ Lab I.D. 10103937
1	CML-SD-45	SL		7/11/11	0915				1	X												001
2	CML-SD-43				0930				1	X												002
3	CML-SD-40				0940				1	X												003
4	CML-SD-37				0945				1	X												004
5	CML-SD-36				0955				1	X												005
6	CML-SD-34				1010				1	X												006
7	CML-SD-35				1015				1	X												007
8	CML-SD-38				1025				1	X												008
9	CML-SD-41				1035				1	X												009
10	CML-SD-44				1040				1	X												010
11	CML-SD-46				1045				1	X												011
12	CML-SD-33-00	SL			1145				1	X												012

ADDITIONAL COMMENTS	RELINQUISHED BY / AFFILIATION	DATE	TIME	ACCEPTED BY / AFFILIATION	DATE	TIME	SAMPLE CONDITIONS			
	[signature] / THC	7/13/11	1445	[signature] / HEC	7/13/11	1445				
	~~[signature] / HEC~~	7/13/11	1500	[signature]	7/13/11	1500				
	FedEx (G)	7/14/11	0925	[signature]	7/14/11	0925	2.6	Y	Y	X
							Temp in °C	Received on Ice (Y/N)	Custody Sealed Cooler (Y/N)	Samples Intact (Y/N)

ORIGINAL

SAMPLER NAME AND SIGNATURE

PRINT Name of SAMPLER: Luke Donnell

SIGNATURE of SAMPLER: [signature] DATE Signed (MM/DD/YY): 7/13/11

*Important Note: By signing this form you are accepting Pace's NET 30 day payment terms and agreeing to late charges of 1.5% per month for any invoices not paid within 30 days.

F-ALL-Q-020rev.07, 15-May-2007

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CHAIN-OF-CUSTODY / Analytical Request Document

The Chain-of-Custody is a LEGAL DOCUMENT. All relevant fields must be completed accurately.

1321666

Section A Required Client Information:	Section B Required Project Information:	Section C Invoice Information:
Company: Herrera	Report To: Kevin Houck	Attention:
Address:	Copy To: Mark Donner	Company Name:
		Address:
Email To:	Purchase Order No.:	Pace Quote Reference:
Phone: Fax:	Project Name:	Pace Project Manager:
Requested Due Date/TAT:	Project Number:	Pace Profile #:

REGULATORY AGENCY

☐ NPDES ☐ GROUND WATER ☐ DRINKING WATER

☐ UST ☐ RCRA ☐ OTHER _____

Site Location STATE: _____

Section D Required Client Information

SAMPLE ID
(A-Z, 0-9 / ,-)
Sample IDs MUST BE UNIQUE

Matrix Codes — MATRIX / CODE

Drinking Water	DW
Water	WT
Waste Water	WW
Product	P
Soil/Solid	SL
Oil	OL
Wipe	WP
Air	AR
Tissue	TS
Other	OT

Requested Analysis Filtered (Y/N)

ITEM #	MATRIX CODE (see valid codes to left)	SAMPLE TYPE (G=GRAB C=COMP)	COLLECTED COMPOSITE START DATE	COLLECTED COMPOSITE START TIME	COLLECTED COMPOSITE END/GRAB DATE	COLLECTED COMPOSITE END/GRAB TIME	SAMPLE TEMP AT COLLECTION	# OF CONTAINERS	Preservatives: Unpreserved	H_2SO_4	HNO_3	HCl	NaOH	$Na_2S_2O_3$	Methanol	Other	Analysis Test Y/N	Total Metals	Residual Chlorine (Y/N)	Pace Project No./ Lab I.D. 10160257
1	SL		7/6/11	1150				1	X											013
2				1210				1	X											014
3				1220				1	X											015
4				1235				1	X											016
5				1250				1	X											017
6				1255				1	X											018
7				1420				1	X											019
8				1430				1	X											020
9				1435				1	X											021
10				1445				1	X											022
11				1450				1	X											023
12	SL		7/6/11	1500				1	X											024

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ADDITIONAL COMMENTS	RELINQUISHED BY / AFFILIATION	DATE	TIME	ACCEPTED BY / AFFILIATION	DATE	TIME	SAMPLE CONDITIONS			
	THC	7/13/11	1445	HEC	7/13/11	1445				
	HEC	7/13/11	1500		7/13/11	3:00				
	Fed Ex G	7/14/11	0925	Kari Poehls, Pace	7/14/11	0925	2.6	Y	Y	Y

ORIGINAL

SAMPLER NAME AND SIGNATURE

PRINT Name of SAMPLER: Lucy Dannell

SIGNATURE of SAMPLER: [signature] DATE Signed (MM/DD/YY): 7/13/11

Temp in °C | Received on Ice (Y/N) | Custody Sealed Cooler (Y/N) | Samples Intact (Y/N)

*Important Note: By signing this form you are accepting Pace's NET 30 day payment terms and agreeing to late charges of 1.5% per month for any invoices not paid within 30 days.

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CHAIN-OF-CUSTODY / Analytical Request Document

The Chain-of-Custody is a LEGAL DOCUMENT. All relevant fields must be completed accurately.

1429994

Section A Required Client Information:	Section B Required Project Information:	Section C Invoice Information:
Company: Stevens	Report To: Kevin Hoods	Attention:
Address:	Copy To: Mark Doner	Company Name:
		Address:
Email To:	Purchase Order No.:	Pace Quote Reference:
Phone: Fax:	Project Name:	Pace Project Manager:
Requested Due Date/TAT:	Project Number:	Pace Profile #:

REGULATORY AGENCY

☐ NPDES ☐ GROUND WATER ☐ DRINKING WATER

☐ UST ☐ RCRA ☐ OTHER _____

Site Location STATE: _____

Section D Required Client Information

SAMPLE ID
(A-Z, 0-9 / ,-)
Sample IDs MUST BE UNIQUE

Matrix Codes — MATRIX / CODE
Drinking Water DW
Water WT
Waste Water WW
Product P
Soil/Solid SL
Oil OL
Wipe WP
Air AR
Tissue TS
Other OT

Requested Analysis Filtered (Y/N)

ITEM #	SAMPLE ID	MATRIX CODE (see valid codes to left)	SAMPLE TYPE (G=GRAB C=COMP)	COLLECTED: COMPOSITE START DATE	COLLECTED: COMPOSITE START TIME	COLLECTED: COMPOSITE END/GRAB DATE	COLLECTED: COMPOSITE END/GRAB TIME	SAMPLE TEMP AT COLLECTION	# OF CONTAINERS	Preservatives: Unpreserved	H_2SO_4	HNO_3	HCl	NaOH	$Na_2S_2O_3$	Methanol	Other	Analysis Test Y/N	Total Metals	Residual Chlorine (Y/N)	Pace Project No./ Lab I.D.
1	CML-SD-20-00	SL		7/13/11	1505				1	X											025
2	CML-SD-20-02			7/13/11	1550				1	X											026
3	CML-SD-42-00			7/13/11	0815				1	X											027
4	CML-SD-42-02			7/13/11	0845				1	X											028
5	CML-SD-39-00				0900				1	X											029
6	CML-SD-30-00				0920				1	X											030
7	CML-SD-22-00				0935				1	X											031
8	CML-SD-23-00				0945				1	X											032
9	CML-SD-23-02				0950				1	X											033
10	CML-SD-19-00				1010				1	X											034
11	CML-SD-19-02				1015				1	X											035
12	CML-SD-15-00	SL		7/13/11	1025				1	X											036

ADDITIONAL COMMENTS	RELINQUISHED BY / AFFILIATION	DATE	TIME	ACCEPTED BY / AFFILIATION	DATE	TIME	SAMPLE CONDITIONS			
	DPC / THC	7/13/11	1445	DPC	7/13/11	1445				
	DPC / HEC	7/13/11	1500	[illegible]	7/13/11	3:00				
	FedEx (G)	7/14/11	0925	Kari Poehler, Pace	7/14/11	0925	26	V	V	V

ORIGINAL

SAMPLER NAME AND SIGNATURE

PRINT Name of SAMPLER: Luke Dantl

SIGNATURE of SAMPLER: [signature] DATE Signed (MM/DD/YY): 7/13/11

Temp in °C | Received on Ice (Y/N) | Custody Sealed Cooler (Y/N) | Samples Intact (Y/N)

*Important Note: By signing this form you are accepting Pace's NET 30 day payment terms and agreeing to late charges of 1.5% per month for any invoices not paid within 30 days.

Sample Condition Upon Receipt

Pace Analytical

Client Name: Herrera/MDSA Project # 10163437

Courier: ☒ Fed Ex ☐ UPS ☐ USPS ☐ Client ☐ Commercial ☐ Pace Other _____

Tracking #: 8797184

Custody Seal on Cooler/Box Present: ☒ yes ☐ no Seals intact: ☒ yes ☐ no

Packing Material: ☐ Bubble Wrap ☒ Bubble Bags ☐ None ☐ Other _____ Temp Blank: Yes X No _____

Thermometer Used 1383045 or 135 Type of Ice: (Wet) Blue None ☒ Samples on ice, cooling process has begun

Cooler Temperature 2.6 Biological Tissue is Frozen: Yes No

Date and Initials of person examining contents: ESP 7/15/11

Temp should be above freezing to 6°C

Comments:

Chain of Custody Present:	☒Yes	☐No	☐N/A
Chain of Custody Filled Out:	☒Yes	☐No	☐N/A
Chain of Custody Relinquished:	☒Yes	☐No	☐N/A
Sampler Name & Signature on COC:	☒Yes	☐No	☐N/A
Samples Arrived within Hold Time:	☒Yes	☐No	☐N/A
Short Hold Time Analysis (<72hr):	☐Yes	☒No	☐N/A
Rush Turn Around Time Requested:	☐Yes	☒No	☐N/A
Sufficient Volume:	☒Yes	☐No	☐N/A
Correct Containers Used:	☒Yes	☐No	☐N/A
-Pace Containers Used:	☒Yes	☐No	☐N/A
Containers Intact:	☒Yes	☐No	☐N/A
Filtered volume received for Dissolved tests	☐Yes	☐No	☒N/A
Sample Labels match COC:	☒Yes	☐No	☐N/A
-Includes date/time/ID/Analysis Matrix: SL			
All containers needing acid/base preservation have been checked. Noncompliance are noted in 13.	☐Yes	☐No	☒N/A
All containers needing preservation are found to be in compliance with EPA recommendation.	☐Yes	☐No	☒N/A
Exceptions: VOA,Coliform, TOC, Oil and Grease, WI-DRO (water)	☐Yes	☒No	
Samples checked for dechlorination:	☐Yes	☐No	☒N/A
Headspace in VOA Vials (>6mm):	☐Yes	☐No	☒N/A
Trip Blank Present:	☐Yes	☒No	☐N/A
Trip Blank Custody Seals Present	☐Yes	☐No	☒N/A
Pace Trip Blank Lot # (if purchased): NA			

1.
2.
3.
4.
5.
6.
7.
8.
9.
10.
11.
12.
13. ☐ HNO3 ☐ H2SO4 ☐ NaOH ☐ HCl
Samp #

Initial when completed	Lot # of added preservative

14.
15.
16.

Client Notification/ Resolution: Field Data Required? Y / N

Person Contacted: _____ Date/Time: _____

Comments/ Resolution: _____

Project Manager Review: _____ **Date:** 7/14/11

Note: Whenever there is a discrepancy affecting North Carolina compliance samples, a copy of this form will be sent to the North Carolina DEHNR Certification Office (i.e out of hold, incorrect preservative, out of temp, incorrect containers)

Pace Analytical Services, Inc.
602 S 25th Street
Billings, MT 591014549
(406)254-7226

August 09, 2011

Kevin Houck
Herrera Environmental Consultants
101 East Broadway, Suite 610
Missoula, MT 59802

RE: Project: Black Pine Mine
Pace Project No.: 10163483

Dear Kevin Houck:
Enclosed are the analytical results for sample(s) received by the laboratory on July 14, 2011. The results relate only to the samples included in this report.

If you have any questions concerning this report, please feel free to contact me.

Sincerely,

Sally Heinje

sally.heinje@pacelabs.com
Project Manager

Enclosures

cc: Devin Clary, Montana Dept. of Environmental Quality
Mark Donner, Trihydro

REPORT OF LABORATORY ANALYSIS

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(406)254-7226

CERTIFICATIONS

Project: Black Pine Mine
Pace Project No.: 10163483

Minnesota Certification IDs

1700 Elm Street SE Suite 200, Minneapolis, MN 55414
A2LA Certification #: 2926.01
Alaska Certification #: UST-078
Alaska Certification #MN00064
Arizona Certification #: AZ-0014
Arkansas Certification #: 88-0680
California Certification #: 01155CA
EPA Region 8 Certification #: Pace
Florida/NELAP Certification #: E87605
Georgia Certification #: 959
Idaho Certification #: MN00064
Illinois Certification #: 200011
Iowa Certification #: 368
Kansas Certification #: E-10167
Louisiana Certification #: 03086
Louisiana Certification #: LA080009
Maine Certification #: 2007029
Maryland Certification #: 322
Michigan DEQ Certification #: 9909
Minnesota Certification #: 027-053-137
Mississippi Certification #: Pace
Montana Certification #: MT CERT0092
Nebraska Certification #: Pace
Nevada Certification #: MN_00064
New Jersey Certification #: MN-002
New Mexico Certification #: Pace
New York Certification #: 11647
North Carolina Certification #: 530
North Dakota Certification #: R-036
North Dakota Certification #: R-036A
Ohio VAP Certification #: CL101
Oklahoma Certification #: D9921
Oklahoma Certification #: 9507
Oregon Certification #: MN200001
Pennsylvania Certification #: 68-00563
Puerto Rico Certification
Tennessee Certification #: 02818
Texas Certification #: T104704192
Washington Certification #: C754
Wisconsin Certification #: 999407970

Montana Certification IDs

602 South 25th Street, Billings, MT 59101
EPA Region 8 Certification #: 8TMS-Q
Idaho Certification #: MT00012
Montana Certification #: MT CERT0040
NVLAP Certification #: 101292-0
Minnesota Dept of Health Certification #: 030-999-442

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SAMPLE SUMMARY

Project: Black Pine Mine
Pace Project No.: 10163483

Lab ID	Sample ID	Matrix	Date Collected	Date Received
10163483001	**BP-TS-RS-01-04**	Solid	07/12/11 14:08	07/14/11 09:25
10163483002	**BP-TS-SS-01-06**	Solid	07/12/11 14:10	07/14/11 09:25
10163483003	**BP-TS-SS-03-03**	Solid	07/12/11 14:36	07/14/11 09:25
10163483004	**BP-TS-RS-03-02**	Solid	07/12/11 14:40	07/14/11 09:25
10163483005	**BP-TS-SS-02-02**	Solid	07/12/11 15:24	07/14/11 09:25
10163483006	**BP-TS-SS-08-01**	Solid	07/13/11 08:32	07/14/11 09:25
10163483007	**BP-TS-RS-07-04**	Solid	07/13/11 08:49	07/14/11 09:25
10163483008	**BP-TS-SS-07-01**	Solid	07/13/11 08:55	07/14/11 09:25
10163483009	**BP-HM-RS-08-02**	Solid	07/13/11 09:30	07/14/11 09:25
10163483010	**BP-HM-SS-15-00**	Solid	07/13/11 09:45	07/14/11 09:25

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SAMPLE ANALYTE COUNT

Project: Black Pine Mine
Pace Project No.: 10163483

Lab ID	Sample ID	Method	Analysts	Analytes Reported	Laboratory
10163483001	**BP-TS-RS-01-04**	EPA 6020	TL1	12	PASI-M
		EPA 7471	TEM	1	PASI-M
		% Moisture	JDL	1	PASI-M
		Modified Sobek 3.2	JH1	1	PASI-MT
		Modified Sobek 3.2	JH1	5	PASI-MT
		Modified Sobek 3.2	JH1	4	PASI-MT
		Modified Sobek 3.2	JH1	1	PASI-MT
10163483002	**BP-TS-SS-01-06**	EPA 6020	TL1	12	PASI-M
		EPA 7471	TEM	1	PASI-M
		% Moisture	JDL	1	PASI-M
10163483003	**BP-TS-SS-03-03**	EPA 6020	TL1	12	PASI-M
		EPA 7471	TEM	1	PASI-M
		% Moisture	JDL	1	PASI-M
10163483004	**BP-TS-RS-03-02**	EPA 6020	TL1	12	PASI-M
		EPA 7471	TEM	1	PASI-M
		% Moisture	JDL	1	PASI-M
		Modified Sobek 3.2	JH1	1	PASI-MT
		Modified Sobek 3.2	JH1	5	PASI-MT
		Modified Sobek 3.2	JH1	4	PASI-MT
		Modified Sobek 3.2	JH1	1	PASI-MT
10163483005	**BP-TS-SS-02-02**	EPA 6020	TL1	12	PASI-M
		EPA 7471	TEM	1	PASI-M
		% Moisture	JDL	1	PASI-M
10163483006	**BP-TS-SS-08-01**	EPA 6020	TL1	12	PASI-M
		EPA 7471	TEM	1	PASI-M
		% Moisture	JDL	1	PASI-M
10163483007	**BP-TS-RS-07-04**	EPA 6020	RJS	12	PASI-M
		EPA 7471	TEM	1	PASI-M
		% Moisture	JDL	1	PASI-M
		Modified Sobek 3.2	JH1	1	PASI-MT
		Modified Sobek 3.2	JH1	5	PASI-MT
		Modified Sobek 3.2	JH1	4	PASI-MT
		Modified Sobek 3.2	JH1	1	PASI-MT
10163483008	**BP-TS-SS-07-01**	EPA 6020	RJS	12	PASI-M
		EPA 7471	TEM	1	PASI-M
		% Moisture	JDL	1	PASI-M
10163483009	**BP-HM-RS-08-02**	EPA 6020	RJS	12	PASI-M

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SAMPLE ANALYTE COUNT

Project: Black Pine Mine
Pace Project No.: 10163483

Lab ID	Sample ID	Method	Analysts	Analytes Reported	Laboratory
		EPA 7471	TEM	1	PASI-M
		% Moisture	JDL	1	PASI-M
		Modified Sobek 3.2	JH1	1	PASI-MT
		Modified Sobek 3.2	JH1	5	PASI-MT
		Modified Sobek 3.2	JH1	4	PASI-MT
		Modified Sobek 3.2	JH1	1	PASI-MT
10163483010	**BP-HM-SS-15-00**	EPA 6020	RJS	12	PASI-M
		EPA 7471	TEM	1	PASI-M
		% Moisture	JDL	1	PASI-M
		Modified Sobek 3.2	JH1	1	PASI-MT
		Modified Sobek 3.2	JH1	5	PASI-MT
		Modified Sobek 3.2	JH1	4	PASI-MT
		Modified Sobek 3.2	JH1	1	PASI-MT

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PROJECT NARRATIVE

Project: Black Pine Mine
Pace Project No.: 10163483

Method: **EPA 6020**
Description: 6020 MET ICPMS
Client: Montana Dept. of Environmental Quality
Date: August 09, 2011

General Information:
10 samples were analyzed for EPA 6020. All samples were received in acceptable condition with any exceptions noted below.

Hold Time:
The samples were analyzed within the method required hold times with any exceptions noted below.

Sample Preparation:
The samples were prepared in accordance with EPA 3050 with any exceptions noted below.

Initial Calibrations (including MS Tune as applicable):
All criteria were within method requirements with any exceptions noted below.

Continuing Calibration:
All criteria were within method requirements with any exceptions noted below.

Internal Standards:
All internal standards were within QC limits with any exceptions noted below.

Method Blank:
All analytes were below the report limit in the method blank with any exceptions noted below.

Laboratory Control Spike:
All laboratory control spike compounds were within QC limits with any exceptions noted below.

Matrix Spikes:
All percent recoveries and relative percent differences (RPDs) were within acceptance criteria with any exceptions noted below.

QC Batch: MPRP/27167

A matrix spike and matrix spike duplicate (MS/MSD) were performed on the following sample(s): 10163483007,10163634007

M6: Matrix spike and Matrix spike duplicate recovery not evaluated against control limits due to sample dilution.

- MS (Lab ID: 1014855)
  - Antimony
  - Arsenic
  - Barium
  - Cadmium
  - Chromium
  - Copper
  - Iron
  - Lead
  - Manganese
  - Nickel
  - Zinc
- MS (Lab ID: 1014857)
  - Antimony

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PROJECT NARRATIVE

Project: Black Pine Mine
Pace Project No.: 10163483

Method: **EPA 6020**
Description: 6020 MET ICPMS
Client: Montana Dept. of Environmental Quality
Date: August 09, 2011

QC Batch: MPRP/27167

A matrix spike and matrix spike duplicate (MS/MSD) were performed on the following sample(s): 10163483007,10163634007

M6: Matrix spike and Matrix spike duplicate recovery not evaluated against control limits due to sample dilution.

- Arsenic
- Barium
- Cadmium
- Chromium
- Copper
- Iron
- Lead
- Manganese
- Nickel
- Silver
- Zinc

- MSD (Lab ID: 1014856)
  - Antimony
  - Arsenic
  - Barium
  - Cadmium
  - Chromium
  - Copper
  - Iron
  - Lead
  - Manganese
  - Nickel
  - Zinc

QC Batch: MPRP/27166

A matrix spike and matrix spike duplicate (MS/MSD) were performed on the following sample(s): 10163633001,10163633011

M6: Matrix spike and Matrix spike duplicate recovery not evaluated against control limits due to sample dilution.

- MS (Lab ID: 1014850)
  - Antimony
  - Arsenic
  - Barium
  - Cadmium
  - Chromium
  - Copper
  - Iron
  - Lead
  - Manganese
  - Nickel
  - Silver
  - Zinc
- MS (Lab ID: 1014852)
  - Antimony
  - Arsenic

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PROJECT NARRATIVE

Project: Black Pine Mine
Pace Project No.: 10163483

Method: **EPA 6020**
Description: 6020 MET ICPMS
Client: Montana Dept. of Environmental Quality
Date: August 09, 2011

QC Batch: MPRP/27166

A matrix spike and matrix spike duplicate (MS/MSD) were performed on the following sample(s): 10163633001,10163633011

M6: Matrix spike and Matrix spike duplicate recovery not evaluated against control limits due to sample dilution.

- Barium
- Cadmium
- Chromium
- Copper
- Iron
- Lead
- Manganese
- Nickel
- Silver
- Zinc

- MSD (Lab ID: 1014851)
  - Antimony
  - Arsenic
  - Barium
  - Cadmium
  - Chromium
  - Copper
  - Iron
  - Lead
  - Manganese
  - Nickel
  - Silver
  - Zinc

Duplicate Sample:
All duplicate sample results were within method acceptance criteria with any exceptions noted below.

Additional Comments:

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(406)254-7226

PROJECT NARRATIVE

Project: Black Pine Mine
Pace Project No.: 10163483

Method: **EPA 7471**
Description: 7471 Mercury
Client: Montana Dept. of Environmental Quality
Date: August 09, 2011

General Information:
10 samples were analyzed for EPA 7471. All samples were received in acceptable condition with any exceptions noted below.

Hold Time:
The samples were analyzed within the method required hold times with any exceptions noted below.

Sample Preparation:
The samples were prepared in accordance with EPA 7471 with any exceptions noted below.

Initial Calibrations (including MS Tune as applicable):
All criteria were within method requirements with any exceptions noted below.

Continuing Calibration:
All criteria were within method requirements with any exceptions noted below.

Method Blank:
All analytes were below the report limit in the method blank with any exceptions noted below.

Laboratory Control Spike:
All laboratory control spike compounds were within QC limits with any exceptions noted below.

Matrix Spikes:
All percent recoveries and relative percent differences (RPDs) were within acceptance criteria with any exceptions noted below.

QC Batch: MERP/5632

A matrix spike and matrix spike duplicate (MS/MSD) were performed on the following sample(s): 10163246001,10163483010

M1: Matrix spike recovery exceeded QC limits. Batch accepted based on laboratory control sample (LCS) recovery.

- MS (Lab ID: 1014984)
  - Mercury
- MSD (Lab ID: 1014985)
  - Mercury

M6: Matrix spike and Matrix spike duplicate recovery not evaluated against control limits due to sample dilution.

- MS (Lab ID: 1014986)
  - Mercury

Duplicate Sample:
All duplicate sample results were within method acceptance criteria with any exceptions noted below.

Additional Comments:

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PROJECT NARRATIVE

Project: Black Pine Mine
Pace Project No.: 10163483

Method: **Modified Sobek 3.2**
Description: Sobek Acid Base Potential
Client: Montana Dept. of Environmental Quality
Date: August 09, 2011

General Information:
5 samples were analyzed for Modified Sobek 3.2. All samples were received in acceptable condition with any exceptions noted below.

Hold Time:
The samples were analyzed within the method required hold times with any exceptions noted below.

Initial Calibrations (including MS Tune as applicable):
All criteria were within method requirements with any exceptions noted below.

Continuing Calibration:
All criteria were within method requirements with any exceptions noted below.

Internal Standards:
All internal standards were within QC limits with any exceptions noted below.

Surrogates:
All surrogates were within QC limits with any exceptions noted below.

Method Blank:
All analytes were below the report limit in the method blank with any exceptions noted below.

Laboratory Control Spike:
All laboratory control spike compounds were within QC limits with any exceptions noted below.

Matrix Spikes:
All percent recoveries and relative percent differences (RPDs) were within acceptance criteria with any exceptions noted below.

Duplicate Sample:
All duplicate sample results were within method acceptance criteria with any exceptions noted below.

Additional Comments:

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PROJECT NARRATIVE

Project: Black Pine Mine
Pace Project No.: 10163483

Method: **Modified Sobek 3.2**
Description: Sobek Extractable Sulfur
Client: Montana Dept. of Environmental Quality
Date: August 09, 2011

General Information:
5 samples were analyzed for Modified Sobek 3.2. All samples were received in acceptable condition with any exceptions noted below.

Hold Time:
The samples were analyzed within the method required hold times with any exceptions noted below.

Initial Calibrations (including MS Tune as applicable):
All criteria were within method requirements with any exceptions noted below.

Continuing Calibration:
All criteria were within method requirements with any exceptions noted below.

Internal Standards:
All internal standards were within QC limits with any exceptions noted below.

Surrogates:
All surrogates were within QC limits with any exceptions noted below.

Method Blank:
All analytes were below the report limit in the method blank with any exceptions noted below.

Laboratory Control Spike:
All laboratory control spike compounds were within QC limits with any exceptions noted below.

Matrix Spikes:
All percent recoveries and relative percent differences (RPDs) were within acceptance criteria with any exceptions noted below.

Duplicate Sample:
All duplicate sample results were within method acceptance criteria with any exceptions noted below.

Additional Comments:

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PROJECT NARRATIVE

Project: Black Pine Mine
Pace Project No.: 10163483

Method: **Modified Sobek 3.2**
Description: Sobek Calculations
Client: Montana Dept. of Environmental Quality
Date: August 09, 2011

General Information:
5 samples were analyzed for Modified Sobek 3.2. All samples were received in acceptable condition with any exceptions noted below.

Hold Time:
The samples were analyzed within the method required hold times with any exceptions noted below.

Initial Calibrations (including MS Tune as applicable):
All criteria were within method requirements with any exceptions noted below.

Continuing Calibration:
All criteria were within method requirements with any exceptions noted below.

Internal Standards:
All internal standards were within QC limits with any exceptions noted below.

Surrogates:
All surrogates were within QC limits with any exceptions noted below.

Method Blank:
All analytes were below the report limit in the method blank with any exceptions noted below.

Laboratory Control Spike:
All laboratory control spike compounds were within QC limits with any exceptions noted below.

Matrix Spikes:
All percent recoveries and relative percent differences (RPDs) were within acceptance criteria with any exceptions noted below.

Duplicate Sample:
All duplicate sample results were within method acceptance criteria with any exceptions noted below.

Additional Comments:

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PROJECT NARRATIVE

Project: Black Pine Mine
Pace Project No.: 10163483

Method: **Modified Sobek 3.2**
Description: Sobek SMP Buffer pH
Client: Montana Dept. of Environmental Quality
Date: August 09, 2011

General Information:
5 samples were analyzed for Modified Sobek 3.2. All samples were received in acceptable condition with any exceptions noted below.

Hold Time:
The samples were analyzed within the method required hold times with any exceptions noted below.

Initial Calibrations (including MS Tune as applicable):
All criteria were within method requirements with any exceptions noted below.

Continuing Calibration:
All criteria were within method requirements with any exceptions noted below.

Internal Standards:
All internal standards were within QC limits with any exceptions noted below.

Surrogates:
All surrogates were within QC limits with any exceptions noted below.

Method Blank:
All analytes were below the report limit in the method blank with any exceptions noted below.

Laboratory Control Spike:
All laboratory control spike compounds were within QC limits with any exceptions noted below.

Matrix Spikes:
All percent recoveries and relative percent differences (RPDs) were within acceptance criteria with any exceptions noted below.

Duplicate Sample:
All duplicate sample results were within method acceptance criteria with any exceptions noted below.

Additional Comments:

This data package has been reviewed for quality and completeness and is approved for release.

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ANALYTICAL RESULTS

Project: Black Pine Mine
Pace Project No.: 10163483

Sample: BP-TS-RS-01-04 **Lab ID: 10163483001** Collected: 07/12/11 14:08 Received: 07/14/11 09:25 Matrix: Solid

Results reported on a "dry-weight" basis

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
6020 MET ICPMS	Analytical Method: EPA 6020 Preparation Method: EPA 3050							
Antimony	**508**	mg/kg	2.2	100	08/01/11 15:37	08/03/11 17:56	7440-36-0	
Arsenic	**629**	mg/kg	2.2	100	08/01/11 15:37	08/03/11 17:56	7440-38-2	
Barium	**241**	mg/kg	0.26	20	08/01/11 15:37	08/03/11 17:40	7440-39-3	
Cadmium	**3.9**	mg/kg	0.070	20	08/01/11 15:37	08/03/11 17:40	7440-43-9	
Chromium	**1.8**	mg/kg	0.44	20	08/01/11 15:37	08/03/11 17:40	7440-47-3	
Copper	**1510**	mg/kg	2.2	100	08/01/11 15:37	08/03/11 17:56	7440-50-8	
Iron	**26500**	mg/kg	220	100	08/01/11 15:37	08/03/11 17:56	7439-89-6	
Lead	**1880**	mg/kg	0.44	100	08/01/11 15:37	08/03/11 17:56	7439-92-1	
Manganese	**248**	mg/kg	0.44	20	08/01/11 15:37	08/03/11 17:40	7439-96-5	
Nickel	**<2.2**	mg/kg	2.2	100	08/01/11 15:37	08/03/11 17:56	7440-02-0	
Silver	**63.7**	mg/kg	0.44	20	08/01/11 15:37	08/03/11 17:40	7440-22-4	
Zinc	**149**	mg/kg	22.0	100	08/01/11 15:37	08/03/11 17:56	7440-66-6	
7471 Mercury	Analytical Method: EPA 7471 Preparation Method: EPA 7471							
Mercury	**2.3**	mg/kg	0.18	10	07/28/11 19:33	07/31/11 12:57	7439-97-6	
Dry Weight	Analytical Method: % Moisture							
Percent Moisture	**5.2**	%	0.10	1		07/22/11 00:00		
Sobek Acid Base Potential	Analytical Method: Modified Sobek 3.2							
Neutralization Potential	**<0.5**	tons/1000	0.50	1		08/02/11 00:00		
Sobek Extractable Sulfur	Analytical Method: Modified Sobek 3.2							
Sulfur, HCl Extractable	**<0.050**	% (w/w)	0.050	1		08/02/11 09:40		
Sulfur, HNO3 Extractable	**0.0546**	% (w/w)	0.050	1		08/02/11 09:40		
Sulfur, Hot Water Extractable	**0.0639**	% (w/w)	0.050	1		08/02/11 09:40		
Sulfur, Residual	**<0.050**	% (w/w)	0.050	1		08/02/11 09:40		
Total Sulfur	**0.141**	% (w/w)	0.050	1		08/02/11 09:40		
Sobek Calculations	Analytical Method: Modified Sobek 3.2							
Acid/Base Potential	**0**	tons/1000		1		08/02/11 00:00		
Acid Potential	**<4.3**	tons/1000	4.3	1		08/02/11 00:00		
Lime Requirement	**<5.4**	tons/1000	5.4	1		08/02/11 00:00		
SMP Lime Requirement	**0**	tons/1000	0.0	1		08/02/11 00:00		
Sobek SMP Buffer pH	Analytical Method: Modified Sobek 3.2							
SMP Buffer pH	**7.1**	Std. Units	0.10	1		07/26/11 09:40		

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ANALYTICAL RESULTS

Project: Black Pine Mine
Pace Project No.: 10163483

Sample: BP-TS-SS-01-06 **Lab ID: 10163483002** Collected: 07/12/11 14:10 Received: 07/14/11 09:25 Matrix: Solid

Results reported on a "dry-weight" basis

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
6020 MET ICPMS	Analytical Method: EPA 6020 Preparation Method: EPA 3050							
Antimony	**7.5**	mg/kg	0.51	20	08/01/11 15:37	08/03/11 17:59	7440-36-0	
Arsenic	**11.5**	mg/kg	0.51	20	08/01/11 15:37	08/03/11 17:59	7440-38-2	
Barium	**130**	mg/kg	0.30	20	08/01/11 15:37	08/03/11 17:59	7440-39-3	
Cadmium	**0.31**	mg/kg	0.081	20	08/01/11 15:37	08/03/11 17:59	7440-43-9	
Chromium	**4.8**	mg/kg	0.51	20	08/01/11 15:37	08/03/11 17:59	7440-47-3	
Copper	**19.0**	mg/kg	0.51	20	08/01/11 15:37	08/03/11 17:59	7440-50-8	
Iron	**6920**	mg/kg	50.7	20	08/01/11 15:37	08/03/11 17:59	7439-89-6	
Lead	**28.6**	mg/kg	0.10	20	08/01/11 15:37	08/03/11 17:59	7439-92-1	
Manganese	**660**	mg/kg	2.5	100	08/01/11 15:37	08/03/11 18:02	7439-96-5	
Nickel	**5.1**	mg/kg	0.51	20	08/01/11 15:37	08/03/11 17:59	7440-02-0	
Silver	**1.5**	mg/kg	0.51	20	08/01/11 15:37	08/03/11 17:59	7440-22-4	
Zinc	**32.3**	mg/kg	5.1	20	08/01/11 15:37	08/03/11 17:59	7440-66-6	
7471 Mercury	Analytical Method: EPA 7471 Preparation Method: EPA 7471							
Mercury	**0.047**	mg/kg	0.019	1	07/28/11 19:33	07/31/11 13:09	7439-97-6	
Dry Weight	Analytical Method: % Moisture							
Percent Moisture	**10.3**	%	0.10	1		07/22/11 00:00		

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ANALYTICAL RESULTS

Project: Black Pine Mine
Pace Project No.: 10163483

Sample: BP-TS-SS-03-03 **Lab ID: 10163483003** Collected: 07/12/11 14:36 Received: 07/14/11 09:25 Matrix: Solid

Results reported on a "dry-weight" basis

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
6020 MET ICPMS	Analytical Method: EPA 6020 Preparation Method: EPA 3050							
Antimony	**5.7**	mg/kg	0.58	20	08/01/11 15:37	08/03/11 18:06	7440-36-0	
Arsenic	**11.5**	mg/kg	0.58	20	08/01/11 15:37	08/03/11 18:06	7440-38-2	
Barium	**154**	mg/kg	0.35	20	08/01/11 15:37	08/03/11 18:06	7440-39-3	
Cadmium	**0.87**	mg/kg	0.093	20	08/01/11 15:37	08/03/11 18:06	7440-43-9	
Chromium	**7.5**	mg/kg	0.58	20	08/01/11 15:37	08/03/11 18:06	7440-47-3	
Copper	**730**	mg/kg	11.6	400	08/01/11 15:37	08/03/11 18:09	7440-50-8	
Iron	**11400**	mg/kg	57.9	20	08/01/11 15:37	08/03/11 18:06	7439-89-6	
Lead	**65.7**	mg/kg	0.12	20	08/01/11 15:37	08/03/11 18:06	7439-92-1	
Manganese	**457**	mg/kg	0.58	20	08/01/11 15:37	08/03/11 18:06	7439-96-5	
Nickel	**6.5**	mg/kg	0.58	20	08/01/11 15:37	08/03/11 18:06	7440-02-0	
Silver	**<0.58**	mg/kg	0.58	20	08/01/11 15:37	08/03/11 18:06	7440-22-4	
Zinc	**72.4**	mg/kg	5.8	20	08/01/11 15:37	08/03/11 18:06	7440-66-6	
7471 Mercury	Analytical Method: EPA 7471 Preparation Method: EPA 7471							
Mercury	**0.029**	mg/kg	0.021	1	07/28/11 19:33	07/31/11 13:11	7439-97-6	
Dry Weight	Analytical Method: % Moisture							
Percent Moisture	**14.5**	%	0.10	1		07/22/11 00:00		

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ANALYTICAL RESULTS

Project: Black Pine Mine
Pace Project No.: 10163483

Sample: BP-TS-RS-03-02 **Lab ID: 10163483004** Collected: 07/12/11 14:40 Received: 07/14/11 09:25 Matrix: Solid

Results reported on a "dry-weight" basis

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
6020 MET ICPMS	Analytical Method: EPA 6020 Preparation Method: EPA 3050							
Antimony	**712**	mg/kg	2.5	100	08/01/11 15:37	08/03/11 18:15	7440-36-0	
Arsenic	**868**	mg/kg	2.5	100	08/01/11 15:37	08/03/11 18:15	7440-38-2	
Barium	**186**	mg/kg	1.5	100	08/01/11 15:37	08/03/11 18:15	7440-39-3	
Cadmium	**6.0**	mg/kg	0.40	100	08/01/11 15:37	08/03/11 18:15	7440-43-9	
Chromium	**1.7**	mg/kg	0.50	20	08/01/11 15:37	08/03/11 18:12	7440-47-3	
Copper	**794**	mg/kg	2.5	100	08/01/11 15:37	08/03/11 18:15	7440-50-8	
Iron	**28100**	mg/kg	249	100	08/01/11 15:37	08/03/11 18:15	7439-89-6	
Lead	**3060**	mg/kg	2.0	400	08/01/11 15:37	08/04/11 13:49	7439-92-1	
Manganese	**125**	mg/kg	0.50	20	08/01/11 15:37	08/03/11 18:12	7439-96-5	
Nickel	**2.7**	mg/kg	2.5	100	08/01/11 15:37	08/03/11 18:15	7440-02-0	
Silver	**201**	mg/kg	2.5	100	08/01/11 15:37	08/03/11 18:15	7440-22-4	
Zinc	**144**	mg/kg	24.9	100	08/01/11 15:37	08/03/11 18:15	7440-66-6	
7471 Mercury	Analytical Method: EPA 7471 Preparation Method: EPA 7471							
Mercury	**2.1**	mg/kg	0.19	10	07/28/11 19:33	07/31/11 13:18	7439-97-6	
Dry Weight	Analytical Method: % Moisture							
Percent Moisture	**3.6**	%	0.10	1		07/22/11 00:00		
Sobek Acid Base Potential	Analytical Method: Modified Sobek 3.2							
Neutralization Potential	**<0.5**	tons/1000	0.50	1		08/02/11 00:00		
Sobek Extractable Sulfur	Analytical Method: Modified Sobek 3.2							
Sulfur, HCl Extractable	**<0.050**	% (w/w)	0.050	1		08/02/11 09:54		
Sulfur, HNO3 Extractable	**0.0625**	% (w/w)	0.050	1		08/02/11 09:54		
Sulfur, Hot Water Extractable	**0.0695**	% (w/w)	0.050	1		08/02/11 09:54		
Sulfur, Residual	**<0.050**	% (w/w)	0.050	1		08/02/11 09:54		
Total Sulfur	**0.161**	% (w/w)	0.050	1		08/02/11 09:54		
Sobek Calculations	Analytical Method: Modified Sobek 3.2							
Acid/Base Potential	**0**	tons/1000		1		08/02/11 00:00		
Acid Potential	**<4.3**	tons/1000	4.3	1		08/02/11 00:00		
Lime Requirement	**<5.4**	tons/1000	5.4	1		08/02/11 00:00		
SMP Lime Requirement	**1.0**	tons/1000	0.0	1		08/02/11 00:00		
Sobek SMP Buffer pH	Analytical Method: Modified Sobek 3.2							
SMP Buffer pH	**6.8**	Std. Units	0.10	1		07/26/11 09:40		

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ANALYTICAL RESULTS

Project: Black Pine Mine
Pace Project No.: 10163483

Sample: BP-TS-SS-02-02 **Lab ID: 10163483005** Collected: 07/12/11 15:24 Received: 07/14/11 09:25 Matrix: Solid

Results reported on a "dry-weight" basis

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
6020 MET ICPMS	Analytical Method: EPA 6020 Preparation Method: EPA 3050							
Antimony	**109**	mg/kg	0.54	20	08/01/11 15:37	08/03/11 18:18	7440-36-0	
Arsenic	**79.8**	mg/kg	0.54	20	08/01/11 15:37	08/03/11 18:18	7440-38-2	
Barium	**146**	mg/kg	0.32	20	08/01/11 15:37	08/03/11 18:18	7440-39-3	
Cadmium	**3.0**	mg/kg	0.086	20	08/01/11 15:37	08/03/11 18:18	7440-43-9	
Chromium	**4.1**	mg/kg	0.54	20	08/01/11 15:37	08/03/11 18:18	7440-47-3	
Copper	**189**	mg/kg	0.54	20	08/01/11 15:37	08/03/11 18:18	7440-50-8	
Iron	**7240**	mg/kg	53.6	20	08/01/11 15:37	08/03/11 18:18	7439-89-6	
Lead	**328**	mg/kg	0.11	20	08/01/11 15:37	08/03/11 18:18	7439-92-1	
Manganese	**325**	mg/kg	0.54	20	08/01/11 15:37	08/03/11 18:18	7439-96-5	
Nickel	**4.8**	mg/kg	0.54	20	08/01/11 15:37	08/03/11 18:18	7440-02-0	
Silver	**17.7**	mg/kg	0.54	20	08/01/11 15:37	08/03/11 18:18	7440-22-4	
Zinc	**56.6**	mg/kg	5.4	20	08/01/11 15:37	08/03/11 18:18	7440-66-6	
7471 Mercury	Analytical Method: EPA 7471 Preparation Method: EPA 7471							
Mercury	**1.0**	mg/kg	0.021	1	07/28/11 19:33	07/31/11 13:20	7439-97-6	
Dry Weight	Analytical Method: % Moisture							
Percent Moisture	**8.6**	%	0.10	1		07/22/11 00:00		

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ANALYTICAL RESULTS

Project: Black Pine Mine
Pace Project No.: 10163483

Sample: BP-TS-SS-08-01 **Lab ID: 10163483006** Collected: 07/13/11 08:32 Received: 07/14/11 09:25 Matrix: Solid

Results reported on a "dry-weight" basis

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
6020 MET ICPMS	Analytical Method: EPA 6020 Preparation Method: EPA 3050							
Antimony	**23.0**	mg/kg	0.55	20	08/01/11 15:37	08/03/11 15:34	7440-36-0	
Arsenic	**47.4**	mg/kg	2.8	100	08/01/11 15:37	08/03/11 15:38	7440-38-2	
Barium	**92.5**	mg/kg	0.33	20	08/01/11 15:37	08/03/11 15:34	7440-39-3	
Cadmium	**0.15**	mg/kg	0.089	20	08/01/11 15:37	08/03/11 15:34	7440-43-9	
Chromium	**17.8**	mg/kg	2.8	100	08/01/11 15:37	08/03/11 15:38	7440-47-3	
Copper	**63.0**	mg/kg	2.8	100	08/01/11 15:37	08/03/11 15:38	7440-50-8	
Iron	**21000**	mg/kg	277	100	08/01/11 15:37	08/03/11 15:38	7439-89-6	
Lead	**147**	mg/kg	0.11	20	08/01/11 15:37	08/03/11 15:34	7439-92-1	
Manganese	**109**	mg/kg	2.8	100	08/01/11 15:37	08/03/11 15:38	7439-96-5	
Nickel	**9.0**	mg/kg	2.8	100	08/01/11 15:37	08/03/11 15:38	7440-02-0	
Silver	**2.1**	mg/kg	0.55	20	08/01/11 15:37	08/03/11 15:34	7440-22-4	
Zinc	**62.1**	mg/kg	27.7	100	08/01/11 15:37	08/03/11 15:38	7440-66-6	
7471 Mercury	Analytical Method: EPA 7471 Preparation Method: EPA 7471							
Mercury	**0.15**	mg/kg	0.023	1	07/28/11 19:33	07/31/11 13:22	7439-97-6	
Dry Weight	Analytical Method: % Moisture							
Percent Moisture	**14.0**	%	0.10	1		07/22/11 00:00		

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ANALYTICAL RESULTS

Project: Black Pine Mine
Pace Project No.: 10163483

Sample: BP-TS-RS-07-04 **Lab ID: 10163483007** Collected: 07/13/11 08:49 Received: 07/14/11 09:25 Matrix: Solid

Results reported on a "dry-weight" basis

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
6020 MET ICPMS	Analytical Method: EPA 6020 Preparation Method: EPA 3050							
Antimony	**219**	mg/kg	0.54	20	08/01/11 15:14	08/04/11 03:08	7440-36-0	M6
Arsenic	**118**	mg/kg	0.54	20	08/01/11 15:14	08/04/11 03:08	7440-38-2	M6
Barium	**49.3**	mg/kg	0.33	20	08/01/11 15:14	08/04/11 03:08	7440-39-3	M6
Cadmium	**0.12**	mg/kg	0.087	20	08/01/11 15:14	08/04/11 03:08	7440-43-9	M6
Chromium	**5.4**	mg/kg	0.54	20	08/01/11 15:14	08/04/11 03:08	7440-47-3	M6
Copper	**31.3**	mg/kg	0.54	20	08/01/11 15:14	08/04/11 03:08	7440-50-8	M6
Iron	**17000**	mg/kg	54.4	20	08/01/11 15:14	08/04/11 03:08	7439-89-6	M6
Lead	**162**	mg/kg	0.11	20	08/01/11 15:14	08/04/11 03:08	7439-92-1	M6
Manganese	**67.6**	mg/kg	0.54	20	08/01/11 15:14	08/04/11 03:08	7439-96-5	M6
Nickel	**4.9**	mg/kg	0.54	20	08/01/11 15:14	08/04/11 03:08	7440-02-0	M6
Silver	**13.5**	mg/kg	0.54	20	08/01/11 15:14	08/04/11 03:08	7440-22-4	
Zinc	**18.6**	mg/kg	5.4	20	08/01/11 15:14	08/04/11 03:08	7440-66-6	M6
7471 Mercury	Analytical Method: EPA 7471 Preparation Method: EPA 7471							
Mercury	**1.1**	mg/kg	0.021	1	07/28/11 19:33	07/31/11 13:28	7439-97-6	
Dry Weight	Analytical Method: % Moisture							
Percent Moisture	**9.8**	%	0.10	1		07/22/11 00:00		
Sobek Acid Base Potential	Analytical Method: Modified Sobek 3.2							
Neutralization Potential	**0.72**	tons/1000	0.50	1		08/02/11 00:00		
Sobek Extractable Sulfur	Analytical Method: Modified Sobek 3.2							
Sulfur, HCl Extractable	**<0.050**	% (w/w)	0.050	1		08/02/11 10:40		
Sulfur, HNO3 Extractable	**<0.050**	% (w/w)	0.050	1		08/02/11 10:40		
Sulfur, Hot Water Extractable	**<0.050**	% (w/w)	0.050	1		08/02/11 10:40		
Sulfur, Residual	**<0.050**	% (w/w)	0.050	1		08/02/11 10:40		
Total Sulfur	**0.0920**	% (w/w)	0.050	1		08/02/11 10:40		
Sobek Calculations	Analytical Method: Modified Sobek 3.2							
Acid/Base Potential	**0.7**	tons/1000		1		08/02/11 00:00		
Acid Potential	**<4.3**	tons/1000	4.3	1		08/02/11 00:00		
Lime Requirement	**<5.4**	tons/1000	5.4	1		08/02/11 00:00		
SMP Lime Requirement	**0**	tons/1000	0.0	1		08/02/11 00:00		
Sobek SMP Buffer pH	Analytical Method: Modified Sobek 3.2							
SMP Buffer pH	**7.3**	Std. Units	0.10	1		07/26/11 09:40		

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ANALYTICAL RESULTS

Project: Black Pine Mine
Pace Project No.: 10163483

Sample: BP-TS-SS-07-01 **Lab ID: 10163483008** Collected: 07/13/11 08:55 Received: 07/14/11 09:25 Matrix: Solid

Results reported on a "dry-weight" basis

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
6020 MET ICPMS	Analytical Method: EPA 6020 Preparation Method: EPA 3050							
Antimony	**64.2**	mg/kg	0.54	20	08/01/11 15:14	08/04/11 04:01	7440-36-0	
Arsenic	**73.6**	mg/kg	0.54	20	08/01/11 15:14	08/04/11 04:01	7440-38-2	
Barium	**84.1**	mg/kg	0.32	20	08/01/11 15:14	08/04/11 04:01	7440-39-3	
Cadmium	**0.14**	mg/kg	0.086	20	08/01/11 15:14	08/04/11 04:01	7440-43-9	
Chromium	**10.1**	mg/kg	0.54	20	08/01/11 15:14	08/04/11 04:01	7440-47-3	
Copper	**28.2**	mg/kg	0.54	20	08/01/11 15:14	08/04/11 04:01	7440-50-8	
Iron	**14600**	mg/kg	53.9	20	08/01/11 15:14	08/04/11 04:01	7439-89-6	
Lead	**200**	mg/kg	0.11	20	08/01/11 15:14	08/04/11 04:01	7439-92-1	
Manganese	**217**	mg/kg	0.54	20	08/01/11 15:14	08/04/11 04:01	7439-96-5	
Nickel	**6.0**	mg/kg	0.54	20	08/01/11 15:14	08/04/11 04:01	7440-02-0	
Silver	**12.8**	mg/kg	0.54	20	08/01/11 15:14	08/04/11 04:01	7440-22-4	
Zinc	**36.3**	mg/kg	5.4	20	08/01/11 15:14	08/04/11 04:01	7440-66-6	
7471 Mercury	Analytical Method: EPA 7471 Preparation Method: EPA 7471							
Mercury	**0.69**	mg/kg	0.020	1	07/28/11 19:33	07/31/11 13:30	7439-97-6	
Dry Weight	Analytical Method: % Moisture							
Percent Moisture	**10.0**	%	0.10	1		07/22/11 00:00		

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ANALYTICAL RESULTS

Project: Black Pine Mine
Pace Project No.: 10163483

Sample: BP-HM-RS-08-02 **Lab ID: 10163483009** Collected: 07/13/11 09:30 Received: 07/14/11 09:25 Matrix: Solid

Results reported on a "dry-weight" basis

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
6020 MET ICPMS	Analytical Method: EPA 6020 Preparation Method: EPA 3050							
Antimony	**27.6**	mg/kg	0.45	20	08/01/11 15:14	08/04/11 04:05	7440-36-0	
Arsenic	**41.5**	mg/kg	0.45	20	08/01/11 15:14	08/04/11 04:05	7440-38-2	
Barium	**92.9**	mg/kg	0.27	20	08/01/11 15:14	08/04/11 04:05	7440-39-3	
Cadmium	**1.7**	mg/kg	0.073	20	08/01/11 15:14	08/04/11 04:05	7440-43-9	
Chromium	**12.3**	mg/kg	0.45	20	08/01/11 15:14	08/04/11 04:05	7440-47-3	
Copper	**329**	mg/kg	4.5	200	08/01/11 15:14	08/04/11 04:22	7440-50-8	
Iron	**12500**	mg/kg	45.5	20	08/01/11 15:14	08/04/11 04:05	7439-89-6	
Lead	**614**	mg/kg	0.91	200	08/01/11 15:14	08/04/11 04:22	7439-92-1	
Manganese	**412**	mg/kg	4.5	200	08/01/11 15:14	08/04/11 04:22	7439-96-5	
Nickel	**9.9**	mg/kg	0.45	20	08/01/11 15:14	08/04/11 04:05	7440-02-0	
Silver	**3.6**	mg/kg	0.45	20	08/01/11 15:14	08/04/11 04:05	7440-22-4	
Zinc	**191**	mg/kg	4.5	20	08/01/11 15:14	08/04/11 04:05	7440-66-6	
7471 Mercury	Analytical Method: EPA 7471 Preparation Method: EPA 7471							
Mercury	**0.57**	mg/kg	0.020	1	07/28/11 19:33	07/31/11 13:32	7439-97-6	
Dry Weight	Analytical Method: % Moisture							
Percent Moisture	**7.6**	%	0.10	1		07/22/11 00:00		
Sobek Acid Base Potential	Analytical Method: Modified Sobek 3.2							
Neutralization Potential	**6.0**	tons/1000	0.50	1		08/02/11 00:00		
Sobek Extractable Sulfur	Analytical Method: Modified Sobek 3.2							
Sulfur, HCl Extractable	**<0.050**	% (w/w)	0.050	1		08/02/11 10:53		
Sulfur, HNO3 Extractable	**<0.050**	% (w/w)	0.050	1		08/02/11 10:53		
Sulfur, Hot Water Extractable	**<0.050**	% (w/w)	0.050	1		08/02/11 10:53		
Sulfur, Residual	**<0.050**	% (w/w)	0.050	1		08/02/11 10:53		
Total Sulfur	**<0.050**	% (w/w)	0.050	1		08/02/11 10:53		
Sobek Calculations	Analytical Method: Modified Sobek 3.2							
Acid/Base Potential	**6.0**	tons/1000		1		08/02/11 00:00		
Acid Potential	**<4.3**	tons/1000	4.3	1		08/02/11 00:00		
Lime Requirement	**<5.4**	tons/1000	5.4	1		08/02/11 00:00		
SMP Lime Requirement	**1.0**	tons/1000	0.0	1		08/02/11 00:00		
Sobek SMP Buffer pH	Analytical Method: Modified Sobek 3.2							
SMP Buffer pH	**6.8**	Std. Units	0.10	1		07/26/11 09:40		

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ANALYTICAL RESULTS

Project: Black Pine Mine
Pace Project No.: 10163483

Sample: BP-HM-SS-15-00 **Lab ID: 10163483010** Collected: 07/13/11 09:45 Received: 07/14/11 09:25 Matrix: Solid

Results reported on a "dry-weight" basis

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
6020 MET ICPMS	Analytical Method: EPA 6020 Preparation Method: EPA 3050							
Antimony	**594**	mg/kg	5.1	200	08/01/11 15:14	08/04/11 04:26	7440-36-0	
Arsenic	**501**	mg/kg	5.1	200	08/01/11 15:14	08/04/11 04:26	7440-38-2	
Barium	**218**	mg/kg	0.31	20	08/01/11 15:14	08/04/11 04:10	7440-39-3	
Cadmium	**7.3**	mg/kg	0.082	20	08/01/11 15:14	08/04/11 04:10	7440-43-9	
Chromium	**3.1**	mg/kg	0.51	20	08/01/11 15:14	08/04/11 04:10	7440-47-3	
Copper	**505**	mg/kg	5.1	200	08/01/11 15:14	08/04/11 04:26	7440-50-8	
Iron	**27400**	mg/kg	511	200	08/01/11 15:14	08/04/11 04:26	7439-89-6	
Lead	**2050**	mg/kg	1.0	200	08/01/11 15:14	08/04/11 04:26	7439-92-1	
Manganese	**46.5**	mg/kg	0.51	20	08/01/11 15:14	08/04/11 04:10	7439-96-5	
Nickel	**2.0**	mg/kg	0.51	20	08/01/11 15:14	08/04/11 04:10	7440-02-0	
Silver	**144**	mg/kg	0.51	20	08/01/11 15:14	08/04/11 04:10	7440-22-4	
Zinc	**326**	mg/kg	5.1	20	08/01/11 15:14	08/04/11 04:10	7440-66-6	
7471 Mercury	Analytical Method: EPA 7471 Preparation Method: EPA 7471							
Mercury	**3.6**	mg/kg	0.20	10	07/28/11 19:33	07/31/11 13:47	7439-97-6	M6
Dry Weight	Analytical Method: % Moisture							
Percent Moisture	**8.5**	%	0.10	1		07/22/11 00:00		
Sobek Acid Base Potential	Analytical Method: Modified Sobek 3.2							
Neutralization Potential	**<0.5**	tons/1000	0.50	1		08/02/11 00:00		
Sobek Extractable Sulfur	Analytical Method: Modified Sobek 3.2							
Sulfur, HCl Extractable	**0.0746**	% (w/w)	0.050	1		08/02/11 11:32		
Sulfur, HNO3 Extractable	**0.175**	% (w/w)	0.050	1		08/02/11 11:32		
Sulfur, Hot Water Extractable	**<0.050**	% (w/w)	0.050	1		08/02/11 11:32		
Sulfur, Residual	**<0.050**	% (w/w)	0.050	1		08/02/11 11:32		
Total Sulfur	**0.183**	% (w/w)	0.050	1		08/02/11 11:32		
Sobek Calculations	Analytical Method: Modified Sobek 3.2							
Acid/Base Potential	**-7.5**	tons/1000		1		08/02/11 00:00		
Acid Potential	**7.5**	tons/1000	4.3	1		08/02/11 00:00		
Lime Requirement	**13**	tons/1000	5.4	1		08/02/11 00:00		
SMP Lime Requirement	**3.1**	tons/1000	0.0	1		08/02/11 00:00		
Sobek SMP Buffer pH	Analytical Method: Modified Sobek 3.2							
SMP Buffer pH	**6.5**	Std. Units	0.10	1		07/26/11 09:40		

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QUALITY CONTROL DATA

Project: Black Pine Mine
Pace Project No.: 10163483

QC Batch: MPRP/27166 Analysis Method: EPA 6020
QC Batch Method: EPA 3050 Analysis Description: 6020 MET
Associated Lab Samples: 10163483001, 10163483002, 10163483003, 10163483004, 10163483005, 10163483006

METHOD BLANK: 1014848 Matrix: Solid
Associated Lab Samples: 10163483001, 10163483002, 10163483003, 10163483004, 10163483005, 10163483006

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Antimony	mg/kg	<0.50	0.50	08/03/11 15:51	
Arsenic	mg/kg	<0.50	0.50	08/03/11 15:51	
Barium	mg/kg	<0.30	0.30	08/03/11 15:51	
Cadmium	mg/kg	<0.080	0.080	08/03/11 15:51	
Chromium	mg/kg	<0.50	0.50	08/03/11 15:51	
Copper	mg/kg	<0.50	0.50	08/03/11 15:51	
Iron	mg/kg	<50.0	50.0	08/03/11 15:51	
Lead	mg/kg	<0.10	0.10	08/03/11 15:51	
Manganese	mg/kg	<0.50	0.50	08/03/11 15:51	
Nickel	mg/kg	<0.50	0.50	08/03/11 15:51	
Silver	mg/kg	<0.50	0.50	08/03/11 15:51	
Zinc	mg/kg	<5.0	5.0	08/03/11 15:51	

LABORATORY CONTROL SAMPLE: 1014849

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Antimony	mg/kg	19.6	22.5	115	75-125	
Arsenic	mg/kg	19.6	22.1	112	75-125	
Barium	mg/kg	19.6	22.6	115	75-125	
Cadmium	mg/kg	19.6	22.2	113	75-125	
Chromium	mg/kg	19.6	22.5	115	75-125	
Copper	mg/kg	19.6	23.8	121	75-125	
Iron	mg/kg	245	285	116	75-125	
Lead	mg/kg	19.6	22.5	115	75-125	
Manganese	mg/kg	19.6	23.3	119	75-125	
Nickel	mg/kg	19.6	24.2	123	75-125	
Silver	mg/kg	19.6	23.4	119	75-125	
Zinc	mg/kg	19.6	21.6	110	75-125	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 1014850 1014851

Parameter	Units	10163633001 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Antimony	mg/kg	1380	21.8	22	1430	1420	262	211	75-125	.7	20	M6
Arsenic	mg/kg	1380	21.8	22	1280	1150	-425	-1040	75-125	11	20	M6
Barium	mg/kg	247	21.8	22	281	258	157	49	75-125	9	20	M6
Cadmium	mg/kg	20.6	21.8	22	68.3	69.0	219	220	75-125	1	20	M6
Chromium	mg/kg	2.7	21.8	22	55.3	54.0	241	233	75-125	2	20	M6
Copper	mg/kg	1280	21.8	22	1160	1200	-545	-356	75-125	3	20	M6
Iron	mg/kg	23100	273	275	21700	20600	-513	-892	75-125	5	20	M6

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QUALITY CONTROL DATA

Project: Black Pine Mine
Pace Project No.: 10163483

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 1014850 1014851

Parameter	Units	10163633001 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Lead	mg/kg	6960	21.8	22	6940	7420	-79	2100	75-125	7	20	M6
Manganese	mg/kg	270	21.8	22	332	246	283	-111	75-125	30	20	D6,M6
Nickel	mg/kg	<2.8	21.8	22	50.8	51.5	225	226	75-125	1	20	M6
Silver	mg/kg	319	21.8	22	219	194	-462	-571	75-125	12	20	M6
Zinc	mg/kg	332	21.8	22	432	364	460	145	75-125	17	20	M6

MATRIX SPIKE SAMPLE: 1014852

Parameter	Units	10163633011 Result	Spike Conc.	MS Result	MS % Rec	% Rec Limits	Qualifiers
Antimony	mg/kg	765	19.8	907	714	75-125	M6
Arsenic	mg/kg	515	19.8	2180	8400	75-125	M6
Barium	mg/kg	168	19.8	214	232	75-125	M6
Cadmium	mg/kg	14.9	19.8	63.6	246	75-125	M6
Chromium	mg/kg	4.1	19.8	52.7	245	75-125	M6
Copper	mg/kg	1690	19.8	1970	1410	75-125	M6
Iron	mg/kg	14400	247	15900	623	75-125	M6
Lead	mg/kg	3820	19.8	7060	16400	75-125	M6
Manganese	mg/kg	652	19.8	586	-333	75-125	M6
Nickel	mg/kg	3.9	19.8	52.1	243	75-125	M6
Silver	mg/kg	87.6	19.8	266	899	75-125	M6
Zinc	mg/kg	1150	19.8	1220	402	75-125	M6

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QUALITY CONTROL DATA

Project: Black Pine Mine
Pace Project No.: 10163483

QC Batch: MPRP/27167 Analysis Method: EPA 6020
QC Batch Method: EPA 3050 Analysis Description: 6020 MET
Associated Lab Samples: 10163483007, 10163483008, 10163483009, 10163483010

METHOD BLANK: 1014853 Matrix: Solid
Associated Lab Samples: 10163483007, 10163483008, 10163483009, 10163483010

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Antimony	mg/kg	<0.49	0.49	08/04/11 03:04	
Arsenic	mg/kg	<0.49	0.49	08/04/11 03:04	
Barium	mg/kg	<0.29	0.29	08/04/11 03:04	
Cadmium	mg/kg	<0.078	0.078	08/04/11 03:04	
Chromium	mg/kg	<0.49	0.49	08/04/11 03:04	
Copper	mg/kg	<0.49	0.49	08/04/11 03:04	
Iron	mg/kg	<49.0	49.0	08/04/11 03:04	
Lead	mg/kg	<0.098	0.098	08/04/11 03:04	
Manganese	mg/kg	<0.49	0.49	08/04/11 03:04	
Nickel	mg/kg	<0.49	0.49	08/04/11 03:04	
Silver	mg/kg	<0.49	0.49	08/04/11 03:04	
Zinc	mg/kg	<4.9	4.9	08/04/11 03:04	

LABORATORY CONTROL SAMPLE: 1014854

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Antimony	mg/kg	20	18.2	91	75-125	
Arsenic	mg/kg	20	18.3	92	75-125	
Barium	mg/kg	20	18.1	90	75-125	
Cadmium	mg/kg	20	18.4	92	75-125	
Chromium	mg/kg	20	18.8	94	75-125	
Copper	mg/kg	20	18.9	94	75-125	
Iron	mg/kg	250	233	93	75-125	
Lead	mg/kg	20	18.8	94	75-125	
Manganese	mg/kg	20	18.4	92	75-125	
Nickel	mg/kg	20	18.8	94	75-125	
Silver	mg/kg	20	20.4	102	75-125	
Zinc	mg/kg	20	18.8	94	75-125	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 1014855 1014856

Parameter	Units	10163483007 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Antimony	mg/kg	219	21.7	21.7	178	148	-190	-328	75-125	18	20	M6
Arsenic	mg/kg	118	21.7	21.7	202	156	386	173	75-125	26	20	D6,M6
Barium	mg/kg	49.3	21.7	21.7	115	113	302	293	75-125	2	20	M6
Cadmium	mg/kg	0.12	21.7	21.7	54.2	53.7	249	246	75-125	.9	20	M6
Chromium	mg/kg	5.4	21.7	21.7	61.4	62.0	258	260	75-125	1	20	M6
Copper	mg/kg	31.3	21.7	21.7	88.5	89.2	263	266	75-125	.8	20	M6
Iron	mg/kg	17000	272	272	15300	15900	-622	-408	75-125	4	20	M6

REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL DATA

Project: Black Pine Mine
Pace Project No.: 10163483

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 1014855 1014856

Parameter	Units	10163483007 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Lead	mg/kg	162	21.7	21.7	230	269	311	490	75-125	16	20	M6
Manganese	mg/kg	67.6	21.7	21.7	169	115	467	220	75-125	38	20	D6,M6
Nickel	mg/kg	4.9	21.7	21.7	57.6	57.7	243	243	75-125	.04	20	M6
Silver	mg/kg	13.5	21.7	21.7	39.6	38.2	120	114	75-125	3	20	
Zinc	mg/kg	18.6	21.7	21.7	76.5	80.9	266	287	75-125	6	20	M6

MATRIX SPIKE SAMPLE: 1014857

Parameter	Units	10163634007 Result	Spike Conc.	MS Result	MS % Rec	% Rec Limits	Qualifiers
Antimony	mg/kg	3.3	19.6	41.0	192	75-125	M6
Arsenic	mg/kg	14.4	19.6	69.2	279	75-125	M6
Barium	mg/kg	64.7	19.6	230	841	75-125	M6
Cadmium	mg/kg	1.6	19.6	59.5	295	75-125	M6
Chromium	mg/kg	7.6	19.6	69.5	316	75-125	M6
Copper	mg/kg	220	19.6	263	220	75-125	M6
Iron	mg/kg	11000	245	13400	1010	75-125	M6
Lead	mg/kg	24.4	19.6	96.1	365	75-125	M6
Manganese	mg/kg	419	19.6	838	2130	75-125	M6
Nickel	mg/kg	4.8	19.6	62.7	295	75-125	M6
Silver	mg/kg	<0.60	19.6	28.8	144	75-125	M6
Zinc	mg/kg	101	19.6	169	345	75-125	M6

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(406)254-7226

QUALITY CONTROL DATA

Project: Black Pine Mine
Pace Project No.: 10163483

QC Batch: MERP/5632 Analysis Method: EPA 7471
QC Batch Method: EPA 7471 Analysis Description: 7471 Mercury
Associated Lab Samples: 10163483001, 10163483002, 10163483003, 10163483004, 10163483005, 10163483006, 10163483007, 10163483008, 10163483009, 10163483010

METHOD BLANK: 1014982 Matrix: Solid
Associated Lab Samples: 10163483001, 10163483002, 10163483003, 10163483004, 10163483005, 10163483006, 10163483007, 10163483008, 10163483009, 10163483010

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Mercury	mg/kg	<0.020	0.020	07/31/11 12:13	

LABORATORY CONTROL SAMPLE: 1014983

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Mercury	mg/kg	.48	0.48	100	80-120	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 1014984 1014985

Parameter	Units	10163246001 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Mercury	mg/kg	0.14	.51	.51	0.30	0.34	31	38	80-120	11	20	M1

MATRIX SPIKE SAMPLE: 1014986

Parameter	Units	10163483010 Result	Spike Conc.	MS Result	MS % Rec	% Rec Limits	Qualifiers
Mercury	mg/kg	3.6	.49	4.6	208	80-120	M6

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QUALITY CONTROL DATA

Project: Black Pine Mine
Pace Project No.: 10163483

QC Batch: MPRP/27276 Analysis Method: % Moisture
QC Batch Method: % Moisture Analysis Description: Dry Weight/Percent Moisture
Associated Lab Samples: 10163483001, 10163483002, 10163483003, 10163483004, 10163483005, 10163483006, 10163483007, 10163483008, 10163483009, 10163483010

SAMPLE DUPLICATE: 1018378

Parameter	Units	10163859001 Result	Dup Result	RPD	Max RPD	Qualifiers
Percent Moisture	%	21.9	19.8	10	30	

SAMPLE DUPLICATE: 1018405

Parameter	Units	10164124001 Result	Dup Result	RPD	Max RPD	Qualifiers
Percent Moisture	%	13.0	11.5	12	30	

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QUALITY CONTROL DATA

Project: Black Pine Mine
Pace Project No.: 10163483

QC Batch: MT/6496 Analysis Method: Modified Sobek 3.2
QC Batch Method: Modified Sobek 3.2 Analysis Description: Sobek Acid Base Potential
Associated Lab Samples: 10163483001, 10163483004, 10163483007, 10163483009, 10163483010

METHOD BLANK: 1020547 Matrix: Solid
Associated Lab Samples: 10163483001, 10163483004, 10163483007, 10163483009, 10163483010

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Neutralization Potential	tons/1000	<0.5	0.50	08/02/11 00:00	

SAMPLE DUPLICATE: 1020546

Parameter	Units	10163635003 Result	Dup Result	RPD	Max RPD	Qualifiers
Neutralization Potential	tons/1000	<0.5	0.97			

SAMPLE DUPLICATE: 1020548

Parameter	Units	10163633009 Result	Dup Result	RPD	Max RPD	Qualifiers
Neutralization Potential	tons/1000	<0.5	6.5			

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QUALITY CONTROL DATA

Project: Black Pine Mine
Pace Project No.: 10163483

QC Batch: MT/6487 Analysis Method: Modified Sobek 3.2
QC Batch Method: Modified Sobek 3.2 Analysis Description: Sobek Extractable Sulfur
Associated Lab Samples: 10163483001, 10163483004, 10163483007, 10163483009, 10163483010

METHOD BLANK: 1019970 Matrix: Solid
Associated Lab Samples: 10163483001, 10163483004, 10163483007, 10163483009, 10163483010

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Total Sulfur	% (w/w)	<0.050	0.050	08/01/11 13:07	

SAMPLE DUPLICATE: 1019972

Parameter	Units	10163635003 Result	Dup Result	RPD	Max RPD	Qualifiers
Total Sulfur	% (w/w)	<0.050	<0.050			

SAMPLE DUPLICATE: 1019973

Parameter	Units	10163633008 Result	Dup Result	RPD	Max RPD	Qualifiers
Total Sulfur	% (w/w)	0.369	0.428	15		

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QUALITY CONTROL DATA

Project: Black Pine Mine
Pace Project No.: 10163483

QC Batch: MT/6542 Analysis Method: Modified Sobek 3.2
QC Batch Method: Modified Sobek 3.2 Analysis Description: Sobek SMP Buffer pH
Associated Lab Samples: 10163483001, 10163483004, 10163483007, 10163483009, 10163483010

SAMPLE DUPLICATE: 1022810

Parameter	Units	10163635003 Result	Dup Result	RPD	Max RPD	Qualifiers
SMP Buffer pH	Std. Units	6.4	6.4	.3	20	

SAMPLE DUPLICATE: 1026467

Parameter	Units	10163633008 Result	Dup Result	RPD	Max RPD	Qualifiers
SMP Buffer pH	Std. Units	7.4	7.4	.1	20	

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QUALIFIERS

Project: Black Pine Mine
Pace Project No.: 10163483

DEFINITIONS

DF - Dilution Factor, if reported, represents the factor applied to the reported data due to changes in sample preparation, dilution of the sample aliquot, or moisture content.

ND - Not Detected at or above adjusted reporting limit.

J - Estimated concentration above the adjusted method detection limit and below the adjusted reporting limit.

MDL - Adjusted Method Detection Limit.

S - Surrogate

1,2-Diphenylhydrazine (8270 listed analyte) decomposes to Azobenzene.

Consistent with EPA guidelines, unrounded data are displayed and have been used to calculate % recovery and RPD values.

LCS(D) - Laboratory Control Sample (Duplicate)

MS(D) - Matrix Spike (Duplicate)

DUP - Sample Duplicate

RPD - Relative Percent Difference

NC - Not Calculable.

SG - Silica Gel - Clean-Up

U - Indicates the compound was analyzed for, but not detected.

N-Nitrosodiphenylamine decomposes and cannot be separated from Diphenylamine using Method 8270. The result reported for each analyte is a combined concentration.

LABORATORIES

PASI-M	Pace Analytical Services - Minneapolis
PASI-MT	Pace Analytical Services - Montana

ANALYTE QUALIFIERS

D6	The relative percent difference (RPD) between the sample and sample duplicate exceeded laboratory control limits.
M1	Matrix spike recovery exceeded QC limits. Batch accepted based on laboratory control sample (LCS) recovery.
M6	Matrix spike and Matrix spike duplicate recovery not evaluated against control limits due to sample dilution.

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QUALITY CONTROL DATA CROSS REFERENCE TABLE

Project: Black Pine Mine
Pace Project No.: 10163483

Lab ID	Sample ID	QC Batch Method	QC Batch	Analytical Method	Analytical Batch
10163483001	**BP-TS-RS-01-04**	EPA 3050	MPRP/27166	EPA 6020	ICPM/11156
10163483002	**BP-TS-SS-01-06**	EPA 3050	MPRP/27166	EPA 6020	ICPM/11156
10163483003	**BP-TS-SS-03-03**	EPA 3050	MPRP/27166	EPA 6020	ICPM/11156
10163483004	**BP-TS-RS-03-02**	EPA 3050	MPRP/27166	EPA 6020	ICPM/11156
10163483005	**BP-TS-SS-02-02**	EPA 3050	MPRP/27166	EPA 6020	ICPM/11156
10163483006	**BP-TS-SS-08-01**	EPA 3050	MPRP/27166	EPA 6020	ICPM/11156
10163483007	**BP-TS-RS-07-04**	EPA 3050	MPRP/27167	EPA 6020	ICPM/11153
10163483008	**BP-TS-SS-07-01**	EPA 3050	MPRP/27167	EPA 6020	ICPM/11153
10163483009	**BP-HM-RS-08-02**	EPA 3050	MPRP/27167	EPA 6020	ICPM/11153
10163483010	**BP-HM-SS-15-00**	EPA 3050	MPRP/27167	EPA 6020	ICPM/11153
10163483001	**BP-TS-RS-01-04**	EPA 7471	MERP/5632	EPA 7471	MERC/6492
10163483002	**BP-TS-SS-01-06**	EPA 7471	MERP/5632	EPA 7471	MERC/6492
10163483003	**BP-TS-SS-03-03**	EPA 7471	MERP/5632	EPA 7471	MERC/6492
10163483004	**BP-TS-RS-03-02**	EPA 7471	MERP/5632	EPA 7471	MERC/6492
10163483005	**BP-TS-SS-02-02**	EPA 7471	MERP/5632	EPA 7471	MERC/6492
10163483006	**BP-TS-SS-08-01**	EPA 7471	MERP/5632	EPA 7471	MERC/6492
10163483007	**BP-TS-RS-07-04**	EPA 7471	MERP/5632	EPA 7471	MERC/6492
10163483008	**BP-TS-SS-07-01**	EPA 7471	MERP/5632	EPA 7471	MERC/6492
10163483009	**BP-HM-RS-08-02**	EPA 7471	MERP/5632	EPA 7471	MERC/6492
10163483010	**BP-HM-SS-15-00**	EPA 7471	MERP/5632	EPA 7471	MERC/6492
10163483001	**BP-TS-RS-01-04**	% Moisture	MPRP/27276		
10163483002	**BP-TS-SS-01-06**	% Moisture	MPRP/27276		
10163483003	**BP-TS-SS-03-03**	% Moisture	MPRP/27276		
10163483004	**BP-TS-RS-03-02**	% Moisture	MPRP/27276		
10163483005	**BP-TS-SS-02-02**	% Moisture	MPRP/27276		
10163483006	**BP-TS-SS-08-01**	% Moisture	MPRP/27276		
10163483007	**BP-TS-RS-07-04**	% Moisture	MPRP/27276		
10163483008	**BP-TS-SS-07-01**	% Moisture	MPRP/27276		
10163483009	**BP-HM-RS-08-02**	% Moisture	MPRP/27276		
10163483010	**BP-HM-SS-15-00**	% Moisture	MPRP/27276		
10163483001	**BP-TS-RS-01-04**	Modified Sobek 3.2	MT/6496		
10163483004	**BP-TS-RS-03-02**	Modified Sobek 3.2	MT/6496		
10163483007	**BP-TS-RS-07-04**	Modified Sobek 3.2	MT/6496		
10163483009	**BP-HM-RS-08-02**	Modified Sobek 3.2	MT/6496		
10163483010	**BP-HM-SS-15-00**	Modified Sobek 3.2	MT/6496		
10163483001	**BP-TS-RS-01-04**	Modified Sobek 3.2	MT/6487		
10163483004	**BP-TS-RS-03-02**	Modified Sobek 3.2	MT/6487		
10163483007	**BP-TS-RS-07-04**	Modified Sobek 3.2	MT/6487		
10163483009	**BP-HM-RS-08-02**	Modified Sobek 3.2	MT/6487		
10163483010	**BP-HM-SS-15-00**	Modified Sobek 3.2	MT/6487		
10163483001	**BP-TS-RS-01-04**	Modified Sobek 3.2	MT/6500		
10163483004	**BP-TS-RS-03-02**	Modified Sobek 3.2	MT/6500		
10163483007	**BP-TS-RS-07-04**	Modified Sobek 3.2	MT/6500		
10163483009	**BP-HM-RS-08-02**	Modified Sobek 3.2	MT/6500		
10163483010	**BP-HM-SS-15-00**	Modified Sobek 3.2	MT/6500		

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QUALITY CONTROL DATA CROSS REFERENCE TABLE

Project: Black Pine Mine
Pace Project No.: 10163483

Lab ID	Sample ID	QC Batch Method	QC Batch	Analytical Method	Analytical Batch
10163483001	**BP-TS-RS-01-04**	Modified Sobek 3.2	MT/6542		
10163483004	**BP-TS-RS-03-02**	Modified Sobek 3.2	MT/6542		
10163483007	**BP-TS-RS-07-04**	Modified Sobek 3.2	MT/6542		
10163483009	**BP-HM-RS-08-02**	Modified Sobek 3.2	MT/6542		
10163483010	**BP-HM-SS-15-00**	Modified Sobek 3.2	MT/6542		

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CHAIN-OF-CUSTODY / Analytical Request Document

The Chain-of-Custody is a LEGAL DOCUMENT. All relevant fields must be completed accurately.

Page: 1 of

1429997

Section A Required Client Information:

Company: Herrera	
Address:	
Email To: KhouckCherreraInc.com	
Phone:	Fax:
Requested Due Date/TAT:	

Section B Required Project Information:

Report To: Kevin Houck	
Copy To:	
Purchase Order No.:	
Project Name: Black Pine Mine	
Project Number:	

Section C Invoice Information:

Attention:	
Company Name: DEQ	
Address:	
Pace Quote Reference:	
Pace Project Manager:	
Pace Profile #:	

REGULATORY AGENCY

☐ NPDES ☐ GROUND WATER ☐ DRINKING WATER

☐ UST ☐ RCRA ☐ OTHER _____

Site Location STATE: _____

Section D Required Client Information

SAMPLE ID (A-Z, 0-9 / ,-) Sample IDs MUST BE UNIQUE

Matrix Codes — MATRIX / CODE: Drinking Water DW; Water WT; Waste Water WW; Product P; Soil/Solid SL; Oil OL; Wipe WP; Air AR; Tissue TS; Other OT

Requested Analysis Filtered (Y/N)

ITEM #	SAMPLE ID	MATRIX CODE (see valid codes to left)	SAMPLE TYPE (G=GRAB C=COMP)	COLLECTED COMPOSITE START DATE	COMPOSITE START TIME	COMPOSITE END/GRAB DATE	COMPOSITE END/GRAB TIME	SAMPLE TEMP AT COLLECTION	# OF CONTAINERS	Preservatives: Unpreserved	H_2SO_4	HNO_3	HCl	NaOH	$Na_2S_2O_3$	Methanol	Other	Analysis Test Y/N	Total Met. ABA	Residual Chlorine (Y/N)	Pace Project No./ Lab I.D.
1	BP-TS-RS-01-04	SL	C			7/12/11	1408		2	X									X	X	001
2	BP-TS-SS-01-06	SL	G			7/12/11	1410		1	X									X		002
3	BP-TS-SS-03-03	SL	G			↓	1436		1	X									X		003
4	BP-TS-RS-03-02	SL	C			↓	1440		2	X									X	X	004
5	BP-TS-SS-02-02	SL	G			7/12/11	1524		1	X									X		005
6	BP-TS-SS-08-01	SL	G			7/13/11	0832		1	X									X		006
7	BP-TS-RS-07-04	↓	C	qp		↓	0849		2	X									X	X	007
8	BP-TS-SS-07-01	↓	G			↓	0855		1	X									X		008
9	BP-HM-RS-08-02	SL	C			7/13/11	0930		2	X									X	X	009
10	BP-HM-SS-15-00	SL	G			7/13/11	0945		1	X									X		010
11																					
12																					

Tot. Recoverable Metals = Sb, As, Ba, Cd, Cr, Co, Fe, Pb, Mn, Hg, Ni, Zn - 10116348

ADDITIONAL COMMENTS	RELINQUISHED BY / AFFILIATION	DATE	TIME	ACCEPTED BY / AFFILIATION	DATE	TIME	SAMPLE CONDITIONS			
	HJ Cyt / HEC	7/13/11	1500		7/13/11	3:00				
	Fed Ex (G)	7/14/11	0925	Ken Feeth, Pace	7/14/11	0925	3.1	Y	Y	Y

ORIGINAL

SAMPLER NAME AND SIGNATURE

PRINT Name of SAMPLER:

SIGNATURE of SAMPLER: DATE Signed (MM/DD/YY):

Temp in °C | Received on Ice (Y/N) | Custody Sealed Cooler (Y/N) | Samples Intact (Y/N)

*Important Note: By signing this form you are accepting Pace's NET 30 day payment terms and agreeing to late charges of 1.5% per month for any invoices not paid within 30 days.

F-ALL-Q-020rev.07, 15-May-2007

Sample Condition Upon Receipt

Pace Analytical

Client Name: Herrera

Project # 10163483

Courier: ☒ Fed Ex ☐ UPS ☐ USPS ☐ Client ☐ Commercial ☐ Pace Other _____

Tracking #: 8797184 6001 5282

Custody Seal on Cooler/Box Present: ☒ yes ☐ no Seals intact: ☒ yes ☐ no

Packing Material: ☐ Bubble Wrap ☐ Bubble Bags ☐ None ☐ Other _____ Temp Blank: Yes ____ No X

Thermometer Used 1383048 or 135 Type of Ice: (Wet) Blue None ☒ Samples on ice, cooling process has begun

Cooler Temperature 3.1 Biological Tissue is Frozen: Yes No

Date and Initials of person examining contents: 7/14/11 BN

Temp should be above freezing to 6°C

		Comments:
Chain of Custody Present:	☒Yes ☐No ☐N/A	1.
Chain of Custody Filled Out:	☒Yes ☐No ☐N/A	2.
Chain of Custody Relinquished:	☒Yes ☐No ☐N/A	3.
Sampler Name & Signature on COC:	☐Yes ☒No ☐N/A	4. There was not a Sampler name on CoC
Samples Arrived within Hold Time:	☒Yes ☐No ☐N/A	5.
Short Hold Time Analysis (<72hr):	☐Yes ☒No ☐N/A	6.
Rush Turn Around Time Requested:	☐Yes ☒No ☐N/A	7.
Sufficient Volume:	☒Yes ☐No ☐N/A	8.
Correct Containers Used:	☒Yes ☐No ☐N/A	9. PB
-Pace Containers Used:	☒Yes ☐No ☐N/A	
Containers Intact:	☒Yes ☐No ☐N/A	10.
Filtered volume received for Dissolved tests	☐Yes ☒No ☐N/A	11.
Sample Labels match COC:	☐Yes ☒No ☐N/A	12. COC Does not include PB samples
-Includes date/time/ID/Analysis Matrix: SL		7/15/11 Por 090
All containers needing acid/base preservation have been checked. Noncompliance are noted in 13.	☐Yes ☐No ☒N/A	13. ☐ HNO3 ☐ H2SO4 ☐ NaOH ☐ HCl
All containers needing preservation are found to be in compliance with EPA recommendation.	☐Yes ☐No ☒N/A	Samp #
Exceptions: VOA,Coliform, TOC, Oil and Grease, WI-DRO (water)	☐Yes ☐No MF	Initial when completed / Lot # of added preservative
Samples checked for dechlorination:	☐Yes ☐No ☒N/A	14.
Headspace in VOA Vials (>6mm):	☐Yes ☐No ☒N/A	15.
Trip Blank Present: 7/15/11	☐Yes ☒No ☐N/A	16.
Trip Blank Custody Seals Present	☒Yes ☐No ☐N/A	
Pace Trip Blank Lot # (if purchased): NA 7/15/11		

Client Notification/ Resolution: Field Data Required? Y / N

Person Contacted: _____ Date/Time: _____

Comments/ Resolution: _____

Project Manager Review: _____ **Date:** 7/15/11

Note: Whenever there is a discrepancy affecting North Carolina compliance samples, a copy of this form will be sent to the North Carolina DEHNR Certification Office (i.e out of hold, incorrect preservative, out of temp, incorrect containers)

Pace Analytical Services, Inc.
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(406)254-7226

August 12, 2011

Kevin Houck
Herrera Environmental Consultants
101 East Broadway, Suite 610
Missoula, MT 59802

RE: Project: Black Pine Mine
Pace Project No.: 10163606

Dear Kevin Houck:
Enclosed are the analytical results for sample(s) received by the laboratory on July 14, 2011. The results relate only to the samples included in this report.

If you have any questions concerning this report, please feel free to contact me.

Sincerely,

Sally Heinje

sally.heinje@pacelabs.com
Project Manager

Enclosures

cc: Devin Clary, Montana Dept. of Environmental Quality
Mark Donner, Trihydro

REPORT OF LABORATORY ANALYSIS

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CERTIFICATIONS

Project: Black Pine Mine
Pace Project No.: 10163606

Minnesota Certification IDs

1700 Elm Street SE Suite 200, Minneapolis, MN 55414
A2LA Certification #: 2926.01
Alaska Certification #: UST-078
Alaska Certification #MN00064
Arizona Certification #: AZ-0014
Arkansas Certification #: 88-0680
California Certification #: 01155CA
EPA Region 8 Certification #: Pace
Florida/NELAP Certification #: E87605
Georgia Certification #: 959
Idaho Certification #: MN00064
Illinois Certification #: 200011
Iowa Certification #: 368
Kansas Certification #: E-10167
Louisiana Certification #: 03086
Louisiana Certification #: LA080009
Maine Certification #: 2007029
Maryland Certification #: 322
Michigan DEQ Certification #: 9909
Minnesota Certification #: 027-053-137
Mississippi Certification #: Pace
Montana Certification #: MT CERT0092
Nebraska Certification #: Pace
Nevada Certification #: MN_00064
New Jersey Certification #: MN-002
New Mexico Certification #: Pace
New York Certification #: 11647
North Carolina Certification #: 530
North Dakota Certification #: R-036
North Dakota Certification #: R-036A
Ohio VAP Certification #: CL101
Oklahoma Certification #: D9921
Oklahoma Certification #: 9507
Oregon Certification #: MN200001
Pennsylvania Certification #: 68-00563
Puerto Rico Certification
Tennessee Certification #: 02818
Texas Certification #: T104704192
Washington Certification #: C754
Wisconsin Certification #: 999407970

Montana Certification IDs

602 South 25th Street, Billings, MT 59101
EPA Region 8 Certification #: 8TMS-Q
Idaho Certification #: MT00012
Montana Certification #: MT CERT0040
NVLAP Certification #: 101292-0
Minnesota Dept of Health Certification #: 030-999-442

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SAMPLE SUMMARY

Project: Black Pine Mine
Pace Project No.: 10163606

Lab ID	Sample ID	Matrix	Date Collected	Date Received
10163606001	**BP-HM-SS-03-03**	Solid	07/13/11 10:10	07/14/11 09:25
10163606002	**BP-HM-RS-03-01**	Solid	07/13/11 10:15	07/14/11 09:25
10163606003	**BP-HM-SS-04-10**	Solid	07/13/11 11:30	07/14/11 09:25
10163606004	**BP-HM-RS-04-07**	Solid	07/13/11 11:35	07/14/11 09:25
10163606005	**BP-QC-WT-T1**	Water	07/13/11 12:20	07/14/11 09:25
10163606006	**BP-HM-RS-01-16.5**	Solid	07/13/11 12:45	07/14/11 09:25
10163606007	**BP-HM-RS-01-08**	Solid	07/13/11 13:15	07/14/11 09:25
10163606008	**BP-HM-RS-02-01**	Solid	07/13/11 13:50	07/14/11 09:25
10163606009	**BP-HM-RS-02-03**	Solid	07/13/11 13:55	07/14/11 09:25

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SAMPLE ANALYTE COUNT

Project: Black Pine Mine
Pace Project No.: 10163606

Lab ID	Sample ID	Method	Analysts	Analytes Reported	Laboratory
10163606001	**BP-HM-SS-03-03**	EPA 6020	CJS	12	PASI-M
		EPA 7471	TEM	1	PASI-M
		% Moisture	JDL	1	PASI-M
10163606002	**BP-HM-RS-03-01**	EPA 6020	CJS	12	PASI-M
		EPA 7471	TEM	1	PASI-M
		% Moisture	JDL	1	PASI-M
		Modified Sobek 3.2	JH1	1	PASI-MT
		Modified Sobek 3.2	JH1	5	PASI-MT
		Modified Sobek 3.2	JH1	4	PASI-MT
		Modified Sobek 3.2	JH1	1	PASI-MT
10163606003	**BP-HM-SS-04-10**	EPA 6020	CJS	12	PASI-M
		EPA 7471	TEM	1	PASI-M
		% Moisture	JDL	1	PASI-M
10163606004	**BP-HM-RS-04-07**	EPA 6020	CJS	12	PASI-M
		EPA 7471	TEM	1	PASI-M
		% Moisture	JDL	1	PASI-M
		Modified Sobek 3.2	JH1	1	PASI-MT
		Modified Sobek 3.2	JH1	5	PASI-MT
		Modified Sobek 3.2	JH1	4	PASI-MT
		Modified Sobek 3.2	JH1	1	PASI-MT
10163606005	**BP-QC-WT-T1**	EPA 200.8	CJS	12	PASI-M
		EPA 7470	TEM	1	PASI-M
10163606006	**BP-HM-RS-01-16.5**	EPA 6020	CJS	12	PASI-M
		EPA 7471	TEM	1	PASI-M
		% Moisture	JDL	1	PASI-M
10163606007	**BP-HM-RS-01-08**	EPA 6020	CJS	12	PASI-M
		EPA 7471	TEM	1	PASI-M
		% Moisture	JDL	1	PASI-M
		Modified Sobek 3.2	JH1	1	PASI-MT
		Modified Sobek 3.2	JH1	5	PASI-MT
		Modified Sobek 3.2	JH1	4	PASI-MT
		Modified Sobek 3.2	JH1	1	PASI-MT
10163606008	**BP-HM-RS-02-01**	EPA 6020	CJS	12	PASI-M
		EPA 7471	TEM	1	PASI-M
		% Moisture	JDL	1	PASI-M
		Modified Sobek 3.2	JH1	1	PASI-MT
		Modified Sobek 3.2	JH1	5	PASI-MT

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SAMPLE ANALYTE COUNT

Project: Black Pine Mine
Pace Project No.: 10163606

Lab ID	Sample ID	Method	Analysts	Analytes Reported	Laboratory
		Modified Sobek 3.2	JH1	4	PASI-MT
		Modified Sobek 3.2	JH1	1	PASI-MT
10163606009	**BP-HM-RS-02-03**	EPA 6020	CJS	12	PASI-M
		EPA 7471	TEM	1	PASI-M
		% Moisture	JDL	1	PASI-M

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PROJECT NARRATIVE

Project: Black Pine Mine
Pace Project No.: 10163606

Method: **EPA 200.8**
Description: 200.8 MET ICPMS
Client: Montana Dept. of Environmental Quality
Date: August 12, 2011

General Information:
1 sample was analyzed for EPA 200.8. All samples were received in acceptable condition with any exceptions noted below.

Hold Time:
The samples were analyzed within the method required hold times with any exceptions noted below.

Sample Preparation:
The samples were prepared in accordance with EPA 200.8 with any exceptions noted below.

Initial Calibrations (including MS Tune as applicable):
All criteria were within method requirements with any exceptions noted below.

Continuing Calibration:
All criteria were within method requirements with any exceptions noted below.

Internal Standards:
All internal standards were within QC limits with any exceptions noted below.

Method Blank:
All analytes were below the report limit in the method blank with any exceptions noted below.

Laboratory Control Spike:
All laboratory control spike compounds were within QC limits with any exceptions noted below.

Matrix Spikes:
All percent recoveries and relative percent differences (RPDs) were within acceptance criteria with any exceptions noted below.

QC Batch: MPRP/27157

A matrix spike and matrix spike duplicate (MS/MSD) were performed on the following sample(s): 10163564001,10163589001

M1: Matrix spike recovery exceeded QC limits. Batch accepted based on laboratory control sample (LCS) recovery.

- MS (Lab ID: 1014807)
  - Chromium
  - Iron
  - Nickel
  - Silver
  - Zinc
- MSD (Lab ID: 1014808)
  - Iron
  - Silver

Duplicate Sample:
All duplicate sample results were within method acceptance criteria with any exceptions noted below.

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PROJECT NARRATIVE

Project: Black Pine Mine
Pace Project No.: 10163606

Method: **EPA 200.8**
Description: 200.8 MET ICPMS
Client: Montana Dept. of Environmental Quality
Date: August 12, 2011

Additional Comments:

Analyte Comments:

QC Batch: MPRP/27157

E: Analyte concentration exceeded the calibration range. The reported result is estimated.

- MS (Lab ID: 1014807)
  - Zinc

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PROJECT NARRATIVE

Project: Black Pine Mine
Pace Project No.: 10163606

Method: **EPA 6020**
Description: 6020 MET ICPMS
Client: Montana Dept. of Environmental Quality
Date: August 12, 2011

General Information:
8 samples were analyzed for EPA 6020. All samples were received in acceptable condition with any exceptions noted below.

Hold Time:
The samples were analyzed within the method required hold times with any exceptions noted below.

Sample Preparation:
The samples were prepared in accordance with EPA 3050 with any exceptions noted below.

Initial Calibrations (including MS Tune as applicable):
All criteria were within method requirements with any exceptions noted below.

Continuing Calibration:
All criteria were within method requirements with any exceptions noted below.

Internal Standards:
All internal standards were within QC limits with any exceptions noted below.

Method Blank:
All analytes were below the report limit in the method blank with any exceptions noted below.

QC Batch: MPRP/27163

P8: Analyte was detected in the method blank. All associated samples had concentrations of at least ten times greater than the blank or were below the reporting limit.

- BLANK (Lab ID: 1014833)
  - Lead

Laboratory Control Spike:
All laboratory control spike compounds were within QC limits with any exceptions noted below.

Matrix Spikes:
All percent recoveries and relative percent differences (RPDs) were within acceptance criteria with any exceptions noted below.

QC Batch: MPRP/27163

A matrix spike and matrix spike duplicate (MS/MSD) were performed on the following sample(s): 10163246001,10163606001

M6: Matrix spike and Matrix spike duplicate recovery not evaluated against control limits due to sample dilution.

- MS (Lab ID: 1014835)
  - Antimony
  - Barium
  - Iron
  - Manganese
  - Zinc
- MS (Lab ID: 1014837)
  - Arsenic

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PROJECT NARRATIVE

Project: Black Pine Mine
Pace Project No.: 10163606

Method: **EPA 6020**
Description: 6020 MET ICPMS
Client: Montana Dept. of Environmental Quality
Date: August 12, 2011

QC Batch: MPRP/27163

A matrix spike and matrix spike duplicate (MS/MSD) were performed on the following sample(s): 10163246001,10163606001

M6: Matrix spike and Matrix spike duplicate recovery not evaluated against control limits due to sample dilution.

- Barium
- Copper
- Iron
- Lead
- Manganese
- Zinc

- MSD (Lab ID: 1014836)
  - Antimony
  - Arsenic
  - Barium
  - Iron
  - Manganese
  - Zinc

Duplicate Sample:
All duplicate sample results were within method acceptance criteria with any exceptions noted below.

Additional Comments:

Analyte Comments:

QC Batch: MPRP/27163

E: Analyte concentration exceeded the calibration range. The reported result is estimated.

- MS (Lab ID: 1014835)
  - Manganese
- MSD (Lab ID: 1014836)
  - Manganese

P8: Analyte was detected in the method blank. All associated samples had concentrations of at least ten times greater than the blank or were below the reporting limit.

- BLANK (Lab ID: 1014833)
  - Lead

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PROJECT NARRATIVE

Project: Black Pine Mine
Pace Project No.: 10163606

Method: **EPA 7470**
Description: 7470 Mercury
Client: Montana Dept. of Environmental Quality
Date: August 12, 2011

General Information:
1 sample was analyzed for EPA 7470. All samples were received in acceptable condition with any exceptions noted below.

Hold Time:
The samples were analyzed within the method required hold times with any exceptions noted below.

Sample Preparation:
The samples were prepared in accordance with EPA 7470 with any exceptions noted below.

Initial Calibrations (including MS Tune as applicable):
All criteria were within method requirements with any exceptions noted below.

Continuing Calibration:
All criteria were within method requirements with any exceptions noted below.

Method Blank:
All analytes were below the report limit in the method blank with any exceptions noted below.

Laboratory Control Spike:
All laboratory control spike compounds were within QC limits with any exceptions noted below.

Matrix Spikes:
All percent recoveries and relative percent differences (RPDs) were within acceptance criteria with any exceptions noted below.

QC Batch: MERP/5645

A matrix spike and matrix spike duplicate (MS/MSD) were performed on the following sample(s): 10163392002,10163818001

M1: Matrix spike recovery exceeded QC limits. Batch accepted based on laboratory control sample (LCS) recovery.

- MS (Lab ID: 1016407)
  - Mercury

Duplicate Sample:
All duplicate sample results were within method acceptance criteria with any exceptions noted below.

Additional Comments:

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PROJECT NARRATIVE

Project: Black Pine Mine
Pace Project No.: 10163606

Method: **EPA 7471**
Description: 7471 Mercury
Client: Montana Dept. of Environmental Quality
Date: August 12, 2011

General Information:
8 samples were analyzed for EPA 7471. All samples were received in acceptable condition with any exceptions noted below.

Hold Time:
The samples were analyzed within the method required hold times with any exceptions noted below.

Sample Preparation:
The samples were prepared in accordance with EPA 7471 with any exceptions noted below.

Initial Calibrations (including MS Tune as applicable):
All criteria were within method requirements with any exceptions noted below.

Continuing Calibration:
All criteria were within method requirements with any exceptions noted below.

Method Blank:
All analytes were below the report limit in the method blank with any exceptions noted below.

Laboratory Control Spike:
All laboratory control spike compounds were within QC limits with any exceptions noted below.

Matrix Spikes:
All percent recoveries and relative percent differences (RPDs) were within acceptance criteria with any exceptions noted below.

QC Batch: MERP/5648

A matrix spike and matrix spike duplicate (MS/MSD) were performed on the following sample(s): 10163606001,10163635009

M1: Matrix spike recovery exceeded QC limits. Batch accepted based on laboratory control sample (LCS) recovery.

- MS (Lab ID: 1016597)
  - Mercury
- MSD (Lab ID: 1016598)
  - Mercury

M6: Matrix spike and Matrix spike duplicate recovery not evaluated against control limits due to sample dilution.

- MS (Lab ID: 1016599)
  - Mercury

QC Batch: MERP/5706

A matrix spike and matrix spike duplicate (MS/MSD) were performed on the following sample(s): 10163606006

M1: Matrix spike recovery exceeded QC limits. Batch accepted based on laboratory control sample (LCS) recovery.

- MS (Lab ID: 1024200)
  - Mercury

Duplicate Sample:
All duplicate sample results were within method acceptance criteria with any exceptions noted below.

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PROJECT NARRATIVE

Project: Black Pine Mine
Pace Project No.: 10163606

Method: **EPA 7471**
Description: 7471 Mercury
Client: Montana Dept. of Environmental Quality
Date: August 12, 2011

Additional Comments:

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PROJECT NARRATIVE

Project: Black Pine Mine
Pace Project No.: 10163606

Method: **Modified Sobek 3.2**
Description: Sobek Acid Base Potential
Client: Montana Dept. of Environmental Quality
Date: August 12, 2011

General Information:
4 samples were analyzed for Modified Sobek 3.2. All samples were received in acceptable condition with any exceptions noted below.

Hold Time:
The samples were analyzed within the method required hold times with any exceptions noted below.

Initial Calibrations (including MS Tune as applicable):
All criteria were within method requirements with any exceptions noted below.

Continuing Calibration:
All criteria were within method requirements with any exceptions noted below.

Internal Standards:
All internal standards were within QC limits with any exceptions noted below.

Surrogates:
All surrogates were within QC limits with any exceptions noted below.

Method Blank:
All analytes were below the report limit in the method blank with any exceptions noted below.

Laboratory Control Spike:
All laboratory control spike compounds were within QC limits with any exceptions noted below.

Matrix Spikes:
All percent recoveries and relative percent differences (RPDs) were within acceptance criteria with any exceptions noted below.

Duplicate Sample:
All duplicate sample results were within method acceptance criteria with any exceptions noted below.

Additional Comments:

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PROJECT NARRATIVE

Project: Black Pine Mine
Pace Project No.: 10163606

Method: **Modified Sobek 3.2**
Description: Sobek Extractable Sulfur
Client: Montana Dept. of Environmental Quality
Date: August 12, 2011

General Information:
4 samples were analyzed for Modified Sobek 3.2. All samples were received in acceptable condition with any exceptions noted below.

Hold Time:
The samples were analyzed within the method required hold times with any exceptions noted below.

Initial Calibrations (including MS Tune as applicable):
All criteria were within method requirements with any exceptions noted below.

Continuing Calibration:
All criteria were within method requirements with any exceptions noted below.

Internal Standards:
All internal standards were within QC limits with any exceptions noted below.

Surrogates:
All surrogates were within QC limits with any exceptions noted below.

Method Blank:
All analytes were below the report limit in the method blank with any exceptions noted below.

Laboratory Control Spike:
All laboratory control spike compounds were within QC limits with any exceptions noted below.

Matrix Spikes:
All percent recoveries and relative percent differences (RPDs) were within acceptance criteria with any exceptions noted below.

Duplicate Sample:
All duplicate sample results were within method acceptance criteria with any exceptions noted below.

Additional Comments:

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PROJECT NARRATIVE

Project: Black Pine Mine
Pace Project No.: 10163606

Method: **Modified Sobek 3.2**
Description: Sobek Calculations
Client: Montana Dept. of Environmental Quality
Date: August 12, 2011

General Information:
4 samples were analyzed for Modified Sobek 3.2. All samples were received in acceptable condition with any exceptions noted below.

Hold Time:
The samples were analyzed within the method required hold times with any exceptions noted below.

Initial Calibrations (including MS Tune as applicable):
All criteria were within method requirements with any exceptions noted below.

Continuing Calibration:
All criteria were within method requirements with any exceptions noted below.

Internal Standards:
All internal standards were within QC limits with any exceptions noted below.

Surrogates:
All surrogates were within QC limits with any exceptions noted below.

Method Blank:
All analytes were below the report limit in the method blank with any exceptions noted below.

Laboratory Control Spike:
All laboratory control spike compounds were within QC limits with any exceptions noted below.

Matrix Spikes:
All percent recoveries and relative percent differences (RPDs) were within acceptance criteria with any exceptions noted below.

Duplicate Sample:
All duplicate sample results were within method acceptance criteria with any exceptions noted below.

Additional Comments:

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PROJECT NARRATIVE

Project: Black Pine Mine
Pace Project No.: 10163606

Method: **Modified Sobek 3.2**
Description: Sobek SMP Buffer pH
Client: Montana Dept. of Environmental Quality
Date: August 12, 2011

General Information:
4 samples were analyzed for Modified Sobek 3.2. All samples were received in acceptable condition with any exceptions noted below.

Hold Time:
The samples were analyzed within the method required hold times with any exceptions noted below.

Initial Calibrations (including MS Tune as applicable):
All criteria were within method requirements with any exceptions noted below.

Continuing Calibration:
All criteria were within method requirements with any exceptions noted below.

Internal Standards:
All internal standards were within QC limits with any exceptions noted below.

Surrogates:
All surrogates were within QC limits with any exceptions noted below.

Method Blank:
All analytes were below the report limit in the method blank with any exceptions noted below.

Laboratory Control Spike:
All laboratory control spike compounds were within QC limits with any exceptions noted below.

Matrix Spikes:
All percent recoveries and relative percent differences (RPDs) were within acceptance criteria with any exceptions noted below.

Duplicate Sample:
All duplicate sample results were within method acceptance criteria with any exceptions noted below.

Additional Comments:

This data package has been reviewed for quality and completeness and is approved for release.

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ANALYTICAL RESULTS

Project: Black Pine Mine
Pace Project No.: 10163606

Sample: BP-HM-SS-03-03 **Lab ID: 10163606001** Collected: 07/13/11 10:10 Received: 07/14/11 09:25 Matrix: Solid

Results reported on a "dry-weight" basis

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
6020 MET ICPMS	Analytical Method: EPA 6020 Preparation Method: EPA 3050							
Antimony	**25.8**	mg/kg	0.48	20	07/25/11 09:38	07/31/11 17:07	7440-36-0	
Arsenic	**143**	mg/kg	0.48	20	07/25/11 09:38	07/31/11 17:07	7440-38-2	M6
Barium	**132**	mg/kg	0.29	20	07/25/11 09:38	07/31/11 17:07	7440-39-3	M6
Cadmium	**1.3**	mg/kg	0.077	20	07/25/11 09:38	07/31/11 17:07	7440-43-9	
Chromium	**8.1**	mg/kg	0.48	20	07/25/11 09:38	07/31/11 17:07	7440-47-3	
Copper	**547**	mg/kg	2.4	100	07/25/11 09:38	07/31/11 17:10	7440-50-8	M6
Iron	**15000**	mg/kg	48.2	20	07/25/11 09:38	07/31/11 17:07	7439-89-6	M6
Lead	**339**	mg/kg	0.096	20	07/25/11 09:38	07/31/11 17:07	7439-92-1	M6
Manganese	**352**	mg/kg	0.48	20	07/25/11 09:38	07/31/11 17:07	7439-96-5	M6
Nickel	**9.4**	mg/kg	0.48	20	07/25/11 09:38	07/31/11 17:07	7440-02-0	
Silver	**3.3**	mg/kg	0.48	20	07/25/11 09:38	07/31/11 17:07	7440-22-4	
Zinc	**85.6**	mg/kg	4.8	20	07/25/11 09:38	07/31/11 17:07	7440-66-6	M6
7471 Mercury	Analytical Method: EPA 7471 Preparation Method: EPA 7471							
Mercury	**0.86**	mg/kg	0.021	1	07/22/11 14:30	07/27/11 13:17	7439-97-6	M1
Dry Weight	Analytical Method: % Moisture							
Percent Moisture	**12.2**	%	0.10	1		07/21/11 00:00		

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ANALYTICAL RESULTS

Project: Black Pine Mine
Pace Project No.: 10163606

Sample: BP-HM-RS-03-01 **Lab ID: 10163606002** Collected: 07/13/11 10:15 Received: 07/14/11 09:25 Matrix: Solid

Results reported on a "dry-weight" basis

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
6020 MET ICPMS	Analytical Method: EPA 6020 Preparation Method: EPA 3050							
Antimony	**1140**	mg/kg	2.2	100	07/25/11 09:38	07/31/11 17:17	7440-36-0	
Arsenic	**894**	mg/kg	2.2	100	07/25/11 09:38	07/31/11 17:17	7440-38-2	
Barium	**364**	mg/kg	0.27	20	07/25/11 09:38	07/31/11 17:14	7440-39-3	
Cadmium	**10.8**	mg/kg	0.072	20	07/25/11 09:38	07/31/11 17:14	7440-43-9	
Chromium	**<0.45**	mg/kg	0.45	20	07/25/11 09:38	07/31/11 17:14	7440-47-3	
Copper	**925**	mg/kg	2.2	100	07/25/11 09:38	07/31/11 17:17	7440-50-8	
Iron	**24000**	mg/kg	224	100	07/25/11 09:38	07/31/11 17:17	7439-89-6	
Lead	**2800**	mg/kg	2.2	500	07/25/11 09:38	08/01/11 15:40	7439-92-1	
Manganese	**219**	mg/kg	0.45	20	07/25/11 09:38	07/31/11 17:14	7439-96-5	
Nickel	**1.5**	mg/kg	0.45	20	07/25/11 09:38	07/31/11 17:14	7440-02-0	
Silver	**82.2**	mg/kg	0.45	20	07/25/11 09:38	07/31/11 17:14	7440-22-4	
Zinc	**140**	mg/kg	4.5	20	07/25/11 09:38	07/31/11 17:14	7440-66-6	
7471 Mercury	Analytical Method: EPA 7471 Preparation Method: EPA 7471							
Mercury	**1.2**	mg/kg	0.20	10	07/22/11 14:30	07/27/11 13:43	7439-97-6	
Dry Weight	Analytical Method: % Moisture							
Percent Moisture	**8.4**	%	0.10	1		07/21/11 00:00		
Sobek Acid Base Potential	Analytical Method: Modified Sobek 3.2							
Neutralization Potential	**1.5**	tons/1000	0.50	1		07/29/11 00:00		
Sobek Extractable Sulfur	Analytical Method: Modified Sobek 3.2							
Sulfur, HCl Extractable	**<0.050**	% (w/w)	0.050	1		07/26/11 15:00		
Sulfur, HNO3 Extractable	**<0.050**	% (w/w)	0.050	1		07/26/11 15:00		
Sulfur, Hot Water Extractable	**0.131**	% (w/w)	0.050	1		07/26/11 15:00		
Sulfur, Residual	**<0.050**	% (w/w)	0.050	1		07/26/11 15:00		
Total Sulfur	**0.228**	% (w/w)	0.050	1		07/26/11 15:00		
Sobek Calculations	Analytical Method: Modified Sobek 3.2							
Acid/Base Potential	**1.5**	tons/1000		1		07/26/11 15:00		
Acid Potential	**<4.3**	tons/1000	4.3	1		07/26/11 15:00		
Lime Requirement	**6.3**	tons/1000	5.4	1		07/26/11 15:00		
SMP Lime Requirement	**2.4**	tons/1000	0.0	1		07/26/11 15:00		
Sobek SMP Buffer pH	Analytical Method: Modified Sobek 3.2							
SMP Buffer pH	**6.6**	Std. Units	0.10	1		07/26/11 15:00		

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ANALYTICAL RESULTS

Project: Black Pine Mine
Pace Project No.: 10163606

Sample: BP-HM-SS-04-10 **Lab ID: 10163606003** Collected: 07/13/11 11:30 Received: 07/14/11 09:25 Matrix: Solid

Results reported on a "dry-weight" basis

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
6020 MET ICPMS	Analytical Method: EPA 6020 Preparation Method: EPA 3050							
Antimony	**2.2**	mg/kg	0.46	20	07/25/11 09:38	07/31/11 17:21	7440-36-0	
Arsenic	**7.2**	mg/kg	0.46	20	07/25/11 09:38	07/31/11 17:21	7440-38-2	
Barium	**182**	mg/kg	0.27	20	07/25/11 09:38	07/31/11 17:21	7440-39-3	
Cadmium	**<0.073**	mg/kg	0.073	20	07/25/11 09:38	07/31/11 17:21	7440-43-9	
Chromium	**21.4**	mg/kg	0.46	20	07/25/11 09:38	07/31/11 17:21	7440-47-3	
Copper	**12.9**	mg/kg	0.46	20	07/25/11 09:38	07/31/11 17:21	7440-50-8	
Iron	**23700**	mg/kg	229	100	07/25/11 09:38	07/31/11 17:42	7439-89-6	
Lead	**13.5**	mg/kg	0.092	20	07/25/11 09:38	07/31/11 17:21	7439-92-1	
Manganese	**400**	mg/kg	2.3	100	07/25/11 09:38	07/31/11 17:42	7439-96-5	
Nickel	**18.3**	mg/kg	0.46	20	07/25/11 09:38	07/31/11 17:21	7440-02-0	
Silver	**0.57**	mg/kg	0.46	20	07/25/11 09:38	07/31/11 17:21	7440-22-4	
Zinc	**36.1**	mg/kg	4.6	20	07/25/11 09:38	07/31/11 17:21	7440-66-6	
7471 Mercury	Analytical Method: EPA 7471 Preparation Method: EPA 7471							
Mercury	**0.040**	mg/kg	0.019	1	07/22/11 14:30	07/27/11 13:45	7439-97-6	
Dry Weight	Analytical Method: % Moisture							
Percent Moisture	**15.4**	%	0.10	1		07/21/11 00:00		

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ANALYTICAL RESULTS

Project: Black Pine Mine
Pace Project No.: 10163606

Sample: BP-HM-RS-04-07 **Lab ID: 10163606004** Collected: 07/13/11 11:35 Received: 07/14/11 09:25 Matrix: Solid

Results reported on a "dry-weight" basis

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
6020 MET ICPMS	Analytical Method: EPA 6020 Preparation Method: EPA 3050							
Antimony	**39.1**	mg/kg	0.48	20	07/25/11 09:38	07/31/11 17:45	7440-36-0	
Arsenic	**43.9**	mg/kg	0.48	20	07/25/11 09:38	07/31/11 17:45	7440-38-2	
Barium	**160**	mg/kg	0.29	20	07/25/11 09:38	07/31/11 17:45	7440-39-3	
Cadmium	**0.88**	mg/kg	0.076	20	07/25/11 09:38	07/31/11 17:45	7440-43-9	
Chromium	**8.7**	mg/kg	0.48	20	07/25/11 09:38	07/31/11 17:45	7440-47-3	
Copper	**358**	mg/kg	0.48	20	07/25/11 09:38	07/31/11 17:45	7440-50-8	
Iron	**19600**	mg/kg	47.8	20	07/25/11 09:38	07/31/11 17:45	7439-89-6	
Lead	**216**	mg/kg	0.096	20	07/25/11 09:38	07/31/11 17:45	7439-92-1	
Manganese	**497**	mg/kg	2.4	100	07/25/11 09:38	07/31/11 17:49	7439-96-5	
Nickel	**14.1**	mg/kg	0.48	20	07/25/11 09:38	07/31/11 17:45	7440-02-0	
Silver	**6.5**	mg/kg	0.48	20	07/25/11 09:38	07/31/11 17:45	7440-22-4	
Zinc	**50.6**	mg/kg	4.8	20	07/25/11 09:38	07/31/11 17:45	7440-66-6	
7471 Mercury	Analytical Method: EPA 7471 Preparation Method: EPA 7471							
Mercury	**0.34**	mg/kg	0.018	1	07/22/11 14:30	07/27/11 13:47	7439-97-6	
Dry Weight	Analytical Method: % Moisture							
Percent Moisture	**15.0**	%	0.10	1		07/21/11 00:00		
Sobek Acid Base Potential	Analytical Method: Modified Sobek 3.2							
Neutralization Potential	**3.2**	tons/1000	0.50	1		07/29/11 00:00		
Sobek Extractable Sulfur	Analytical Method: Modified Sobek 3.2							
Sulfur, HCl Extractable	**<0.050**	% (w/w)	0.050	1		07/26/11 15:00		
Sulfur, HNO3 Extractable	**<0.050**	% (w/w)	0.050	1		07/26/11 15:00		
Sulfur, Hot Water Extractable	**<0.050**	% (w/w)	0.050	1		07/26/11 15:00		
Sulfur, Residual	**<0.050**	% (w/w)	0.050	1		07/26/11 15:00		
Total Sulfur	**<0.050**	% (w/w)	0.050	1		07/26/11 15:00		
Sobek Calculations	Analytical Method: Modified Sobek 3.2							
Acid/Base Potential	**3.2**	tons/1000		1		07/26/11 15:00		
Acid Potential	**<4.3**	tons/1000	4.3	1		07/26/11 15:00		
Lime Requirement	**<5.4**	tons/1000	5.4	1		07/26/11 15:00		
SMP Lime Requirement	**2.4**	tons/1000	0.0	1		07/26/11 15:00		
Sobek SMP Buffer pH	Analytical Method: Modified Sobek 3.2							
SMP Buffer pH	**6.6**	Std. Units	0.10	1		07/26/11 15:00		

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ANALYTICAL RESULTS

Project: Black Pine Mine
Pace Project No.: 10163606

Sample: BP-QC-WT-T1 **Lab ID: 10163606005** Collected: 07/13/11 12:20 Received: 07/14/11 09:25 Matrix: Water

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
200.8 MET ICPMS	Analytical Method: EPA 200.8 Preparation Method: EPA 200.8							
Antimony	**<0.50**	ug/L	0.50	1	07/21/11 16:00	07/28/11 06:30	7440-36-0	
Arsenic	**<0.50**	ug/L	0.50	1	07/21/11 16:00	07/28/11 06:30	7440-38-2	
Barium	**<0.30**	ug/L	0.30	1	07/21/11 16:00	07/28/11 06:30	7440-39-3	
Cadmium	**<0.080**	ug/L	0.080	1	07/21/11 16:00	07/28/11 06:30	7440-43-9	
Chromium	**<0.50**	ug/L	0.50	1	07/21/11 16:00	07/28/11 06:30	7440-47-3	
Copper	**<0.50**	ug/L	0.50	1	07/21/11 16:00	07/28/11 06:30	7440-50-8	
Iron	**<50.0**	ug/L	50.0	1	07/21/11 16:00	07/28/11 06:30	7439-89-6	
Lead	**0.47**	ug/L	0.10	1	07/21/11 16:00	07/28/11 06:30	7439-92-1	
Manganese	**<0.50**	ug/L	0.50	1	07/21/11 16:00	07/28/11 06:30	7439-96-5	
Nickel	**<0.50**	ug/L	0.50	1	07/21/11 16:00	07/28/11 06:30	7440-02-0	
Silver	**<0.50**	ug/L	0.50	1	07/21/11 16:00	07/28/11 06:30	7440-22-4	
Zinc	**<5.0**	ug/L	5.0	1	07/21/11 16:00	07/28/11 06:30	7440-66-6	
7470 Mercury	Analytical Method: EPA 7470 Preparation Method: EPA 7470							
Mercury	**<0.20**	ug/L	0.20	1	07/20/11 13:24	07/21/11 13:33	7439-97-6	

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ANALYTICAL RESULTS

Project: Black Pine Mine
Pace Project No.: 10163606

Sample: BP-HM-RS-01-16.5 **Lab ID: 10163606006** Collected: 07/13/11 12:45 Received: 07/14/11 09:25 Matrix: Solid

Results reported on a "dry-weight" basis

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
6020 MET ICPMS	Analytical Method: EPA 6020 Preparation Method: EPA 3050							
Antimony	**1.1**	mg/kg	0.45	20	07/25/11 09:38	07/31/11 17:52	7440-36-0	
Arsenic	**6.1**	mg/kg	0.45	20	07/25/11 09:38	07/31/11 17:52	7440-38-2	
Barium	**127**	mg/kg	0.27	20	07/25/11 09:38	07/31/11 17:52	7440-39-3	
Cadmium	**<0.073**	mg/kg	0.073	20	07/25/11 09:38	07/31/11 17:52	7440-43-9	
Chromium	**13.1**	mg/kg	0.45	20	07/25/11 09:38	07/31/11 17:52	7440-47-3	
Copper	**12.1**	mg/kg	0.45	20	07/25/11 09:38	07/31/11 17:52	7440-50-8	
Iron	**21100**	mg/kg	227	100	07/25/11 09:38	07/31/11 17:56	7439-89-6	
Lead	**9.6**	mg/kg	0.091	20	07/25/11 09:38	07/31/11 17:52	7439-92-1	
Manganese	**211**	mg/kg	0.45	20	07/25/11 09:38	07/31/11 17:52	7439-96-5	
Nickel	**15.3**	mg/kg	0.45	20	07/25/11 09:38	07/31/11 17:52	7440-02-0	
Silver	**<0.45**	mg/kg	0.45	20	07/25/11 09:38	07/31/11 17:52	7440-22-4	
Zinc	**31.4**	mg/kg	4.5	20	07/25/11 09:38	07/31/11 17:52	7440-66-6	
7471 Mercury	Analytical Method: EPA 7471 Preparation Method: EPA 7471							
Mercury	**0.046**	mg/kg	0.023	1	08/01/11 10:30	08/01/11 13:03	7439-97-6	M1
Dry Weight	Analytical Method: % Moisture							
Percent Moisture	**19.6**	%	0.10	1		07/21/11 00:00		

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ANALYTICAL RESULTS

Project: Black Pine Mine
Pace Project No.: 10163606

Sample: BP-HM-RS-01-08 **Lab ID: 10163606007** Collected: 07/13/11 13:15 Received: 07/14/11 09:25 Matrix: Solid

Results reported on a "dry-weight" basis

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
6020 MET ICPMS	Analytical Method: EPA 6020 Preparation Method: EPA 3050							
Antimony	**1.2**	mg/kg	0.48	20	07/25/11 09:38	07/31/11 17:59	7440-36-0	
Arsenic	**7.9**	mg/kg	0.48	20	07/25/11 09:38	07/31/11 17:59	7440-38-2	
Barium	**126**	mg/kg	0.29	20	07/25/11 09:38	07/31/11 17:59	7440-39-3	
Cadmium	**0.36**	mg/kg	0.076	20	07/25/11 09:38	07/31/11 17:59	7440-43-9	
Chromium	**9.9**	mg/kg	0.48	20	07/25/11 09:38	07/31/11 17:59	7440-47-3	
Copper	**71.5**	mg/kg	0.48	20	07/25/11 09:38	07/31/11 17:59	7440-50-8	
Iron	**19800**	mg/kg	47.7	20	07/25/11 09:38	07/31/11 17:59	7439-89-6	
Lead	**8.6**	mg/kg	0.095	20	07/25/11 09:38	07/31/11 17:59	7439-92-1	
Manganese	**119**	mg/kg	0.48	20	07/25/11 09:38	07/31/11 17:59	7439-96-5	
Nickel	**13.6**	mg/kg	0.48	20	07/25/11 09:38	07/31/11 17:59	7440-02-0	
Silver	**<0.48**	mg/kg	0.48	20	07/25/11 09:38	07/31/11 17:59	7440-22-4	
Zinc	**47.9**	mg/kg	4.8	20	07/25/11 09:38	07/31/11 17:59	7440-66-6	
7471 Mercury	Analytical Method: EPA 7471 Preparation Method: EPA 7471							
Mercury	**0.077**	mg/kg	0.021	1	07/22/11 14:30	07/27/11 13:54	7439-97-6	
Dry Weight	Analytical Method: % Moisture							
Percent Moisture	**14.1**	%	0.10	1		07/21/11 00:00		
Sobek Acid Base Potential	Analytical Method: Modified Sobek 3.2							
Neutralization Potential	**0.74**	tons/1000	0.50	1		07/29/11 00:00		
Sobek Extractable Sulfur	Analytical Method: Modified Sobek 3.2							
Sulfur, HCl Extractable	**<0.050**	% (w/w)	0.050	1		07/26/11 15:00		
Sulfur, HNO3 Extractable	**<0.050**	% (w/w)	0.050	1		07/26/11 15:00		
Sulfur, Hot Water Extractable	**<0.050**	% (w/w)	0.050	1		07/26/11 15:00		
Sulfur, Residual	**<0.050**	% (w/w)	0.050	1		07/26/11 15:00		
Total Sulfur	**<0.050**	% (w/w)	0.050	1		07/26/11 15:00		
Sobek Calculations	Analytical Method: Modified Sobek 3.2							
Acid/Base Potential	**0.74**	tons/1000		1		07/26/11 15:00		
Acid Potential	**<4.3**	tons/1000	4.3	1		07/26/11 15:00		
Lime Requirement	**<5.4**	tons/1000	5.4	1		07/26/11 15:00		
SMP Lime Requirement	**1.8**	tons/1000	0.0	1		07/26/11 15:00		
Sobek SMP Buffer pH	Analytical Method: Modified Sobek 3.2							
SMP Buffer pH	**6.7**	Std. Units	0.10	1		07/26/11 15:00		

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ANALYTICAL RESULTS

Project: Black Pine Mine
Pace Project No.: 10163606

Sample: BP-HM-RS-02-01 **Lab ID: 10163606008** Collected: 07/13/11 13:50 Received: 07/14/11 09:25 Matrix: Solid

Results reported on a "dry-weight" basis

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
6020 MET ICPMS	Analytical Method: EPA 6020 Preparation Method: EPA 3050							
Antimony	**421**	mg/kg	0.56	20	07/25/11 09:38	07/31/11 18:06	7440-36-0	
Arsenic	**376**	mg/kg	0.56	20	07/25/11 09:38	07/31/11 18:06	7440-38-2	
Barium	**149**	mg/kg	0.33	20	07/25/11 09:38	07/31/11 18:06	7440-39-3	
Cadmium	**7.1**	mg/kg	0.089	20	07/25/11 09:38	07/31/11 18:06	7440-43-9	
Chromium	**2.7**	mg/kg	0.56	20	07/25/11 09:38	07/31/11 18:06	7440-47-3	
Copper	**1010**	mg/kg	2.8	100	07/25/11 09:38	07/31/11 18:10	7440-50-8	
Iron	**15900**	mg/kg	55.7	20	07/25/11 09:38	07/31/11 18:06	7439-89-6	
Lead	**1820**	mg/kg	0.56	100	07/25/11 09:38	07/31/11 18:10	7439-92-1	
Manganese	**740**	mg/kg	2.8	100	07/25/11 09:38	07/31/11 18:10	7439-96-5	
Nickel	**6.7**	mg/kg	0.56	20	07/25/11 09:38	07/31/11 18:06	7440-02-0	
Silver	**104**	mg/kg	0.56	20	07/25/11 09:38	07/31/11 18:06	7440-22-4	
Zinc	**71.2**	mg/kg	5.6	20	07/25/11 09:38	07/31/11 18:06	7440-66-6	
7471 Mercury	Analytical Method: EPA 7471 Preparation Method: EPA 7471							
Mercury	**<0.021**	mg/kg	0.021	1	07/22/11 14:30	07/27/11 13:56	7439-97-6	
Dry Weight	Analytical Method: % Moisture							
Percent Moisture	**15.3**	%	0.10	1		07/21/11 00:00		
Sobek Acid Base Potential	Analytical Method: Modified Sobek 3.2							
Neutralization Potential	**1.7**	tons/1000	0.50	1		07/29/11 00:00		
Sobek Extractable Sulfur	Analytical Method: Modified Sobek 3.2							
Sulfur, HCl Extractable	**<0.050**	% (w/w)	0.050	1		07/26/11 15:00		
Sulfur, HNO3 Extractable	**<0.050**	% (w/w)	0.050	1		07/26/11 15:00		
Sulfur, Hot Water Extractable	**<0.050**	% (w/w)	0.050	1		07/26/11 15:00		
Sulfur, Residual	**<0.050**	% (w/w)	0.050	1		07/26/11 15:00		
Total Sulfur	**0.0529**	% (w/w)	0.050	1		07/26/11 15:00		
Sobek Calculations	Analytical Method: Modified Sobek 3.2							
Acid/Base Potential	**1.7**	tons/1000		1		07/26/11 15:00		
Acid Potential	**<4.3**	tons/1000	4.3	1		07/26/11 15:00		
Lime Requirement	**7.3**	tons/1000	5.4	1		07/26/11 15:00		
SMP Lime Requirement	**5.3**	tons/1000	0.0	1		07/26/11 15:00		
Sobek SMP Buffer pH	Analytical Method: Modified Sobek 3.2							
SMP Buffer pH	**6.2**	Std. Units	0.10	1		07/26/11 15:00		

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ANALYTICAL RESULTS

Project: Black Pine Mine
Pace Project No.: 10163606

Sample: BP-HM-RS-02-03 **Lab ID: 10163606009** Collected: 07/13/11 13:55 Received: 07/14/11 09:25 Matrix: Solid

Results reported on a "dry-weight" basis

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
6020 MET ICPMS	Analytical Method: EPA 6020 Preparation Method: EPA 3050							
Antimony	**2.7**	mg/kg	0.42	20	07/25/11 09:38	07/31/11 18:28	7440-36-0	
Arsenic	**11.0**	mg/kg	0.42	20	07/25/11 09:38	07/31/11 18:28	7440-38-2	
Barium	**147**	mg/kg	0.25	20	07/25/11 09:38	07/31/11 18:28	7440-39-3	
Cadmium	**0.23**	mg/kg	0.068	20	07/25/11 09:38	07/31/11 18:28	7440-43-9	
Chromium	**8.5**	mg/kg	0.42	20	07/25/11 09:38	07/31/11 18:28	7440-47-3	
Copper	**23.2**	mg/kg	0.42	20	07/25/11 09:38	07/31/11 18:28	7440-50-8	
Iron	**16500**	mg/kg	42.2	20	07/25/11 09:38	07/31/11 18:28	7439-89-6	
Lead	**34.8**	mg/kg	0.084	20	07/25/11 09:38	07/31/11 18:28	7439-92-1	
Manganese	**620**	mg/kg	2.1	100	07/25/11 09:38	07/31/11 18:31	7439-96-5	
Nickel	**11.2**	mg/kg	0.42	20	07/25/11 09:38	07/31/11 18:28	7440-02-0	
Silver	**<0.42**	mg/kg	0.42	20	07/25/11 09:38	07/31/11 18:28	7440-22-4	
Zinc	**46.6**	mg/kg	4.2	20	07/25/11 09:38	07/31/11 18:28	7440-66-6	
7471 Mercury	Analytical Method: EPA 7471 Preparation Method: EPA 7471							
Mercury	**3.5**	mg/kg	0.23	10	07/22/11 14:30	07/27/11 14:03	7439-97-6	
Dry Weight	Analytical Method: % Moisture							
Percent Moisture	**14.2**	%	0.10	1		07/21/11 00:00		

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QUALITY CONTROL DATA

Project: Black Pine Mine
Pace Project No.: 10163606

QC Batch: MPRP/27157
QC Batch Method: EPA 200.8
Analysis Method: EPA 200.8
Analysis Description: 200.8 MET
Associated Lab Samples: 10163606005

METHOD BLANK: 1014805 Matrix: Water
Associated Lab Samples: 10163606005

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Antimony	ug/L	<0.50	0.50	07/28/11 04:19	
Arsenic	ug/L	<0.50	0.50	07/28/11 04:19	
Barium	ug/L	<0.30	0.30	07/28/11 04:19	
Cadmium	ug/L	<0.080	0.080	07/28/11 04:19	
Chromium	ug/L	<0.50	0.50	07/28/11 04:19	
Copper	ug/L	<0.50	0.50	07/28/11 04:19	
Iron	ug/L	<50.0	50.0	07/28/11 04:19	
Lead	ug/L	<0.10	0.10	07/28/11 14:02	
Manganese	ug/L	<0.50	0.50	07/28/11 04:19	
Nickel	ug/L	<0.50	0.50	07/28/11 04:19	
Silver	ug/L	<0.50	0.50	07/28/11 04:19	
Zinc	ug/L	<5.0	5.0	07/28/11 04:19	

LABORATORY CONTROL SAMPLE: 1014806

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Antimony	ug/L	80	84.8	106	85-115	
Arsenic	ug/L	80	85.9	107	85-115	
Barium	ug/L	80	81.2	102	85-115	
Cadmium	ug/L	80	84.5	106	85-115	
Chromium	ug/L	80	80.0	100	85-115	
Copper	ug/L	80	80.5	101	85-115	
Iron	ug/L	1000	1050	105	85-115	
Lead	ug/L	80	91.3	114	85-115	
Manganese	ug/L	80	80.6	101	85-115	
Nickel	ug/L	80	80.0	100	85-115	
Silver	ug/L	80	70.9	89	85-115	
Zinc	ug/L	80	86.1	108	85-115	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 1014807 1014808

Parameter	Units	10163564001 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Antimony	ug/L	5.3	80	80	88.8	80.0	104	93	70-130	11	20	
Arsenic	ug/L	5.5	80	80	89.2	88.0	105	103	70-130	1	20	
Barium	ug/L	310	80	80	403	378	117	86	70-130	6	20	
Cadmium	ug/L	3.3	80	80	87.9	83.4	106	100	70-130	5	20	
Chromium	ug/L	130	80	80	235	222	132	116	70-130	6	20	M1
Copper	ug/L	91.0	80	80	181	175	112	105	70-130	4	20	
Iron	ug/L	26000	1000	1000	27700	26600	174	67	70-130	4	20	M1

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QUALITY CONTROL DATA

Project: Black Pine Mine
Pace Project No.: 10163606

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 1014807 1014808

Parameter	Units	10163564001 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Lead	ug/L	77.5	80	80	180	142	128	80	70-130	24	20	D6
Manganese	ug/L	389	80	80	480	447	113	72	70-130	7	20	
Nickel	ug/L	987	80	80	1140	1050	198	82	70-130	8	20	M1
Silver	ug/L	ND	80	80	44.1	40.2	55	50	70-130	9	20	M1

MATRIX SPIKE SAMPLE: 1014809

Parameter	Units	10163589001 Result	Spike Conc.	MS Result	MS % Rec	% Rec Limits	Qualifiers
Antimony	ug/L	<0.50	80	87.7	109	70-130	
Arsenic	ug/L	1.4	80	89.9	111	70-130	
Barium	ug/L	21.0	80	110	111	70-130	
Cadmium	ug/L	<0.080	80	82.8	104	70-130	
Chromium	ug/L	<0.50	80	85.6	107	70-130	
Copper	ug/L	0.013 mg/L	80	102	111	70-130	
Iron	ug/L	<50.0	1000	1070	107	70-130	
Lead	ug/L	0.0012 mg/L	80	104	128	70-130	
Manganese	ug/L	<0.50	80	87.1	109	70-130	
Nickel	ug/L	<0.50	80	88.6	110	70-130	
Silver	ug/L	<0.50	80	73.2	91	70-130	
Zinc	ug/L	<5.0	80	87.8	104	70-130	

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QUALITY CONTROL DATA

Project: Black Pine Mine
Pace Project No.: 10163606

QC Batch: MPRP/27163 Analysis Method: EPA 6020
QC Batch Method: EPA 3050 Analysis Description: 6020 MET
Associated Lab Samples: 10163606001, 10163606002, 10163606003, 10163606004, 10163606006, 10163606007, 10163606008, 10163606009

METHOD BLANK: 1014833 Matrix: Solid
Associated Lab Samples: 10163606001, 10163606002, 10163606003, 10163606004, 10163606006, 10163606007, 10163606008, 10163606009

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Antimony	mg/kg	<0.49	0.49	07/31/11 15:14	
Arsenic	mg/kg	<0.49	0.49	07/31/11 15:14	
Barium	mg/kg	<0.29	0.29	07/31/11 15:14	
Cadmium	mg/kg	<0.078	0.078	07/31/11 15:14	
Chromium	mg/kg	<0.49	0.49	07/31/11 15:14	
Copper	mg/kg	<0.49	0.49	07/31/11 15:14	
Iron	mg/kg	<48.5	48.5	07/31/11 15:14	
Lead	mg/kg	0.34	0.097	07/31/11 15:14	P8
Manganese	mg/kg	<0.49	0.49	07/31/11 15:14	
Nickel	mg/kg	<0.49	0.49	07/31/11 15:14	
Silver	mg/kg	<0.49	0.49	07/31/11 15:14	
Zinc	mg/kg	<4.9	4.9	07/31/11 15:14	

LABORATORY CONTROL SAMPLE: 1014834

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Antimony	mg/kg	16	17.7	111	75-125	
Arsenic	mg/kg	16	17.0	106	75-125	
Barium	mg/kg	16	18.0	113	75-125	
Cadmium	mg/kg	16	17.5	109	75-125	
Chromium	mg/kg	16	17.8	112	75-125	
Copper	mg/kg	16	17.9	112	75-125	
Iron	mg/kg	200	227	114	75-125	
Lead	mg/kg	16	17.8	111	75-125	
Manganese	mg/kg	16	18.2	114	75-125	
Nickel	mg/kg	16	18.3	114	75-125	
Silver	mg/kg	16	19.7	123	75-125	
Zinc	mg/kg	16	17.5	109	75-125	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 1014835 1014836

Parameter	Units	10163246001 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Antimony	mg/kg	0.60	19.6	19.5	9.8	8.9	47	43	75-125	10	20	M6
Arsenic	mg/kg	7.2	19.6	19.5	27.9	32.2	105	129	75-125	15	20	M6
Barium	mg/kg	248	19.6	19.5	334	511	437	1350	75-125	42	20	D6,M6
Cadmium	mg/kg	0.31	19.6	19.5	18.5	18.5	93	93	75-125	.3	20	
Chromium	mg/kg	4.4	19.6	19.5	24.9	25.9	104	111	75-125	4	20	

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QUALITY CONTROL DATA

Project: Black Pine Mine
Pace Project No.: 10163606

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 1014835 1014836

Parameter	Units	10163246001 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Copper	mg/kg	5.7	19.6	19.5	25.0	28.6	98	118	75-125	14	20	
Iron	mg/kg	6090	245	243	8220	10800	870	1930	75-125	27	20	D6,M6
Lead	mg/kg	5.4	19.6	19.5	25.3	28.9	101	120	75-125	13	20	
Manganese	mg/kg	782	19.6	19.5	1490	2350	3610	8050	75-125	45	20	D6,E, M6
Nickel	mg/kg	8.5	19.6	19.5	27.8	29.9	99	110	75-125	7	20	
Silver	mg/kg	<0.45	19.6	19.5	20.2	19.9	102	101	75-125	2	20	
Zinc	mg/kg	42.7	19.6	19.5	75.3	102	166	305	75-125	30	20	D6,M6

MATRIX SPIKE SAMPLE: 1014837

Parameter	Units	10163606001 Result	Spike Conc.	MS Result	MS % Rec	% Rec Limits	Qualifiers
Antimony	mg/kg	25.8	16.3	38.9	80	75-125	
Arsenic	mg/kg	143	16.3	50.6	-569	75-125	M6
Barium	mg/kg	132	16.3	164	198	75-125	M6
Cadmium	mg/kg	1.3	16.3	17.4	99	75-125	
Chromium	mg/kg	8.1	16.3	26.2	111	75-125	
Copper	mg/kg	547	16.3	697	924	75-125	M6
Iron	mg/kg	15000	204	15500	257	75-125	M6
Lead	mg/kg	339	16.3	169	-1040	75-125	M6
Manganese	mg/kg	352	16.3	300	-318	75-125	M6
Nickel	mg/kg	9.4	16.3	26.7	106	75-125	
Silver	mg/kg	3.3	16.3	21.4	111	75-125	
Zinc	mg/kg	85.6	16.3	107	132	75-125	M6

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QUALITY CONTROL DATA

Project: Black Pine Mine
Pace Project No.: 10163606

QC Batch: MERP/5645
QC Batch Method: EPA 7470
Analysis Method: EPA 7470
Analysis Description: 7470 Mercury
Associated Lab Samples: 10163606005

METHOD BLANK: 1016403 Matrix: Water
Associated Lab Samples: 10163606005

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Mercury	ug/L	<0.20	0.20	07/21/11 13:06	

LABORATORY CONTROL SAMPLE: 1016404

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Mercury	ug/L	5	5.4	108	80-120	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 1016405 1016406

Parameter	Units	10163392002 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Mercury	ug/L	ND	5	5	4.7	4.9	93	99	80-120	6	20	

MATRIX SPIKE SAMPLE: 1016407

Parameter	Units	10163818001 Result	Spike Conc.	MS Result	MS % Rec	% Rec Limits	Qualifiers
Mercury	ug/L	<0.037	5	3.3	66	80-120	M1

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QUALITY CONTROL DATA

Project: Black Pine Mine
Pace Project No.: 10163606

QC Batch: MERP/5648 Analysis Method: EPA 7471
QC Batch Method: EPA 7471 Analysis Description: 7471 Mercury
Associated Lab Samples: 10163606001, 10163606002, 10163606003, 10163606004, 10163606007, 10163606008, 10163606009

METHOD BLANK: 1016595 Matrix: Solid
Associated Lab Samples: 10163606001, 10163606002, 10163606003, 10163606004, 10163606007, 10163606008, 10163606009

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Mercury	mg/kg	<0.019	0.019	07/27/11 13:13	

LABORATORY CONTROL SAMPLE: 1016596

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Mercury	mg/kg	.47	0.51	108	80-120	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 1016597 1016598

Parameter	Units	10163606001 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Mercury	mg/kg	0.86	.54	.57	0.77	1.3	-16	75	80-120	50	20	D6,M1

MATRIX SPIKE SAMPLE: 1016599

Parameter	Units	10163635009 Result	Spike Conc.	MS Result	MS % Rec	% Rec Limits	Qualifiers
Mercury	mg/kg	13.0	.52	13.3	53	80-120	M6

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QUALITY CONTROL DATA

Project: Black Pine Mine
Pace Project No.: 10163606

QC Batch: MERP/5706
QC Batch Method: EPA 7471
Analysis Method: EPA 7471
Analysis Description: 7471 Mercury
Associated Lab Samples: 10163606006

METHOD BLANK: 1024198 Matrix: Solid
Associated Lab Samples: 10163606006

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Mercury	mg/kg	<0.020	0.020	08/01/11 12:59	

LABORATORY CONTROL SAMPLE: 1024199

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Mercury	mg/kg	.5	0.50	100	80-120	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 1024200 1024201

Parameter	Units	10163606006 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Mercury	mg/kg	0.046	.54	.56	0.69	0.72	121	119	80-120	4	20	M1

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QUALITY CONTROL DATA

Project: Black Pine Mine
Pace Project No.: 10163606

QC Batch: MPRP/27256 Analysis Method: % Moisture
QC Batch Method: % Moisture Analysis Description: Dry Weight/Percent Moisture
Associated Lab Samples: 10163606001, 10163606002, 10163606003

SAMPLE DUPLICATE: 1017553

Parameter	Units	10163864002 Result	Dup Result	RPD	Max RPD	Qualifiers
Percent Moisture	%	23.9	22.3	7	30	

SAMPLE DUPLICATE: 1017554

Parameter	Units	10163606003 Result	Dup Result	RPD	Max RPD	Qualifiers
Percent Moisture	%	15.4	16.0	4	30	

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QUALITY CONTROL DATA

Project: Black Pine Mine
Pace Project No.: 10163606

QC Batch: MPRP/27258 Analysis Method: % Moisture
QC Batch Method: % Moisture Analysis Description: Dry Weight/Percent Moisture
Associated Lab Samples: 10163606004, 10163606006, 10163606007, 10163606008, 10163606009

SAMPLE DUPLICATE: 1017623

Parameter	Units	10163606004 Result	Dup Result	RPD	Max RPD	Qualifiers
Percent Moisture	%	15.0	14.2	5	30	

SAMPLE DUPLICATE: 1017624

Parameter	Units	10163635009 Result	Dup Result	RPD	Max RPD	Qualifiers
Percent Moisture	%	6.9	7.6	9	30	

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QUALITY CONTROL DATA

Project: Black Pine Mine
Pace Project No.: 10163606

QC Batch: MT/6480 Analysis Method: Modified Sobek 3.2
QC Batch Method: Modified Sobek 3.2 Analysis Description: Sobek Acid Base Potential
Associated Lab Samples: 10163606002, 10163606004, 10163606007, 10163606008

METHOD BLANK: 1019986 Matrix: Solid
Associated Lab Samples: 10163606002, 10163606004, 10163606007, 10163606008

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Neutralization Potential	tons/1000	<0.5	0.50	07/29/11 00:00	

SAMPLE DUPLICATE: 1019631

Parameter	Units	10163606002 Result	Dup Result	RPD	Max RPD	Qualifiers
Neutralization Potential	tons/1000	1.5	1.7			

SAMPLE DUPLICATE: 1019632

Parameter	Units	10163246007 Result	Dup Result	RPD	Max RPD	Qualifiers
Neutralization Potential	tons/1000	4.0	5.7			

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QUALITY CONTROL DATA

Project: Black Pine Mine
Pace Project No.: 10163606

QC Batch: MT/6452 Analysis Method: Modified Sobek 3.2
QC Batch Method: Modified Sobek 3.2 Analysis Description: Sobek Extractable Sulfur
Associated Lab Samples: 10163606002, 10163606004, 10163606007, 10163606008

METHOD BLANK: 1017262 Matrix: Solid
Associated Lab Samples: 10163606002, 10163606004, 10163606007, 10163606008

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Total Sulfur	% (w/w)	<0.050	0.050	07/29/11 16:11	

SAMPLE DUPLICATE: 1017264

Parameter	Units	10163606002 Result	Dup Result	RPD	Max RPD	Qualifiers
Total Sulfur	% (w/w)	0.228	0.211	8		

SAMPLE DUPLICATE: 1017265

Parameter	Units	10163246007 Result	Dup Result	RPD	Max RPD	Qualifiers
Total Sulfur	% (w/w)	<0.050	<0.050			

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QUALITY CONTROL DATA

Project: Black Pine Mine
Pace Project No.: 10163606

QC Batch: MT/6481 Analysis Method: Modified Sobek 3.2
QC Batch Method: Modified Sobek 3.2 Analysis Description: Sobek SMP Buffer pH
Associated Lab Samples: 10163606002, 10163606004, 10163606007, 10163606008

LABORATORY CONTROL SAMPLE: 1019634

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
SMP Buffer pH	Std. Units		7.0			

SAMPLE DUPLICATE: 1019635

Parameter	Units	10163606002 Result	Dup Result	RPD	Max RPD	Qualifiers
SMP Buffer pH	Std. Units	6.6	6.6	0	20	

SAMPLE DUPLICATE: 1019636

Parameter	Units	10163246007 Result	Dup Result	RPD	Max RPD	Qualifiers
SMP Buffer pH	Std. Units	6.8	6.8	.7	20	

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QUALIFIERS

Project: Black Pine Mine
Pace Project No.: 10163606

DEFINITIONS

DF - Dilution Factor, if reported, represents the factor applied to the reported data due to changes in sample preparation, dilution of the sample aliquot, or moisture content.

ND - Not Detected at or above adjusted reporting limit.

J - Estimated concentration above the adjusted method detection limit and below the adjusted reporting limit.

MDL - Adjusted Method Detection Limit.

S - Surrogate

1,2-Diphenylhydrazine (8270 listed analyte) decomposes to Azobenzene.

Consistent with EPA guidelines, unrounded data are displayed and have been used to calculate % recovery and RPD values.

LCS(D) - Laboratory Control Sample (Duplicate)

MS(D) - Matrix Spike (Duplicate)

DUP - Sample Duplicate

RPD - Relative Percent Difference

NC - Not Calculable.

SG - Silica Gel - Clean-Up

U - Indicates the compound was analyzed for, but not detected.

N-Nitrosodiphenylamine decomposes and cannot be separated from Diphenylamine using Method 8270. The result reported for each analyte is a combined concentration.

LABORATORIES

PASI-M	Pace Analytical Services - Minneapolis
PASI-MT	Pace Analytical Services - Montana

ANALYTE QUALIFIERS

D6	The relative percent difference (RPD) between the sample and sample duplicate exceeded laboratory control limits.
E	Analyte concentration exceeded the calibration range. The reported result is estimated.
M1	Matrix spike recovery exceeded QC limits. Batch accepted based on laboratory control sample (LCS) recovery.
M6	Matrix spike and Matrix spike duplicate recovery not evaluated against control limits due to sample dilution.
P8	Analyte was detected in the method blank. All associated samples had concentrations of at least ten times greater than the blank or were below the reporting limit.

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QUALITY CONTROL DATA CROSS REFERENCE TABLE

Project: Black Pine Mine
Pace Project No.: 10163606

Lab ID	Sample ID	QC Batch Method	QC Batch	Analytical Method	Analytical Batch
10163606005	**BP-QC-WT-T1**	EPA 200.8	MPRP/27157	EPA 200.8	ICPM/11106
10163606001	**BP-HM-SS-03-03**	EPA 3050	MPRP/27163	EPA 6020	ICPM/11135
10163606002	**BP-HM-RS-03-01**	EPA 3050	MPRP/27163	EPA 6020	ICPM/11135
10163606003	**BP-HM-SS-04-10**	EPA 3050	MPRP/27163	EPA 6020	ICPM/11135
10163606004	**BP-HM-RS-04-07**	EPA 3050	MPRP/27163	EPA 6020	ICPM/11135
10163606006	**BP-HM-RS-01-16.5**	EPA 3050	MPRP/27163	EPA 6020	ICPM/11135
10163606007	**BP-HM-RS-01-08**	EPA 3050	MPRP/27163	EPA 6020	ICPM/11135
10163606008	**BP-HM-RS-02-01**	EPA 3050	MPRP/27163	EPA 6020	ICPM/11135
10163606009	**BP-HM-RS-02-03**	EPA 3050	MPRP/27163	EPA 6020	ICPM/11135
10163606005	**BP-QC-WT-T1**	EPA 7470	MERP/5645	EPA 7470	MERC/6457
10163606001	**BP-HM-SS-03-03**	EPA 7471	MERP/5648	EPA 7471	MERC/6470
10163606002	**BP-HM-RS-03-01**	EPA 7471	MERP/5648	EPA 7471	MERC/6470
10163606003	**BP-HM-SS-04-10**	EPA 7471	MERP/5648	EPA 7471	MERC/6470
10163606004	**BP-HM-RS-04-07**	EPA 7471	MERP/5648	EPA 7471	MERC/6470
10163606006	**BP-HM-RS-01-16.5**	EPA 7471	MERP/5706	EPA 7471	MERC/6506
10163606007	**BP-HM-RS-01-08**	EPA 7471	MERP/5648	EPA 7471	MERC/6470
10163606008	**BP-HM-RS-02-01**	EPA 7471	MERP/5648	EPA 7471	MERC/6470
10163606009	**BP-HM-RS-02-03**	EPA 7471	MERP/5648	EPA 7471	MERC/6470
10163606001	**BP-HM-SS-03-03**	% Moisture	MPRP/27256		
10163606002	**BP-HM-RS-03-01**	% Moisture	MPRP/27256		
10163606003	**BP-HM-SS-04-10**	% Moisture	MPRP/27256		
10163606004	**BP-HM-RS-04-07**	% Moisture	MPRP/27258		
10163606006	**BP-HM-RS-01-16.5**	% Moisture	MPRP/27258		
10163606007	**BP-HM-RS-01-08**	% Moisture	MPRP/27258		
10163606008	**BP-HM-RS-02-01**	% Moisture	MPRP/27258		
10163606009	**BP-HM-RS-02-03**	% Moisture	MPRP/27258		
10163606002	**BP-HM-RS-03-01**	Modified Sobek 3.2	MT/6480		
10163606004	**BP-HM-RS-04-07**	Modified Sobek 3.2	MT/6480		
10163606007	**BP-HM-RS-01-08**	Modified Sobek 3.2	MT/6480		
10163606008	**BP-HM-RS-02-01**	Modified Sobek 3.2	MT/6480		
10163606002	**BP-HM-RS-03-01**	Modified Sobek 3.2	MT/6452		
10163606004	**BP-HM-RS-04-07**	Modified Sobek 3.2	MT/6452		
10163606007	**BP-HM-RS-01-08**	Modified Sobek 3.2	MT/6452		
10163606008	**BP-HM-RS-02-01**	Modified Sobek 3.2	MT/6452		
10163606002	**BP-HM-RS-03-01**	Modified Sobek 3.2	MT/6499		
10163606004	**BP-HM-RS-04-07**	Modified Sobek 3.2	MT/6499		
10163606007	**BP-HM-RS-01-08**	Modified Sobek 3.2	MT/6499		
10163606008	**BP-HM-RS-02-01**	Modified Sobek 3.2	MT/6499		
10163606002	**BP-HM-RS-03-01**	Modified Sobek 3.2	MT/6481		
10163606004	**BP-HM-RS-04-07**	Modified Sobek 3.2	MT/6481		
10163606007	**BP-HM-RS-01-08**	Modified Sobek 3.2	MT/6481		
10163606008	**BP-HM-RS-02-01**	Modified Sobek 3.2	MT/6481		

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CHAIN-OF-CUSTODY / Analytical Request Document

The Chain-of-Custody is a LEGAL DOCUMENT. All relevant fields must be completed accurately.

Page: 1 of 1

1429992

Section A Required Client Information:

Company: Herrera
Address:
Email To: Khouck@herreraincom
Phone: Fax:
Requested Due Date/TAT:

Section B Required Project Information:

Report To: Kevin Houck
Copy To:
Purchase Order No.:
Project Name: Black Pine Mine
Project Number:

Section C Invoice Information:

Attention:
Company Name: DEQ
Address:
Pace Quote Reference:
Pace Project Manager:
Pace Profile #:

REGULATORY AGENCY

☐ NPDES ☐ GROUND WATER ☐ DRINKING WATER
☐ UST ☐ RCRA ☐ OTHER

Site Location STATE:

Section D Required Client Information

SAMPLE ID
(A-Z, 0-9 / ,-)
Sample IDs MUST BE UNIQUE

Matrix Codes (MATRIX / CODE): Drinking Water DW; Water WT; Waste Water WW; Product P; Soil/Solid SL; Oil OL; Wipe WP; Air AR; Tissue TS; Other OT

Requested Analysis Filtered (Y/N)

10/13/2011 MPK

Total Met = recoverable Sb, As, Ba, Cd, Cr, Co, Cu, Fe, Pb, Mn, Hg, Ni, 2n

ITEM #	SAMPLE ID	MATRIX CODE (see valid codes to left)	SAMPLE TYPE (G=GRAB C=COMP)	COLLECTED COMPOSITE START DATE	COMPOSITE START TIME	COMPOSITE END/GRAB DATE	COMPOSITE END/GRAB TIME	SAMPLE TEMP AT COLLECTION	# OF CONTAINERS	Preservatives: Unpreserved	H_2SO_4	HNO_3	HCl	NaOH	$Na_2S_2O_3$	Methanol	Other	Analysis Test Y/N	Tot. Rec. Metal ABA	Residual Chlorine (Y/N)	Pace Project No./ Lab I.D.
1	BP-HM-SS-03-03	SL	G			7/13/11	1010		1	X								X	X		001
2	BP-HM-RS-03-01	SL	C			7/13/11	1015		2	X								X	XX		002
3	BP-HM-SS-04-10	↓	G			↓	1130		1	X								X	X		003
4	BP-HM-RS-04-07	↓	C			↓	1135		2	X								X	X		004
5	BP-QC-WT-T1	WT	G			7/13/11	1230		1			X						X			005
6	BP-HM-RS-01-16.5	SL	C			7/13/11	1245		1	X								X			006
7	BP-HM-RS-01-08	SL	C			7/13/11	1315		2	X								X	X		007
8	BP-HM-RS-02-01	SL	C			7/13/11	1350		2	X								X	X		008
9	BP-HM-RS-02-03	SL	G			7/13/11	1355		1	X								X			009
10																					
11																					
12																					

ADDITIONAL COMMENTS	RELINQUISHED BY / AFFILIATION	DATE	TIME	ACCEPTED BY / AFFILIATION	DATE	TIME	SAMPLE CONDITIONS
	NCA / HEC	7/13/11	1500		7/13/11	3:00	
	FedEx (G)	7/14/11	0925	Kara Koehler, Pace	7/14/11	0925	5.3 Y Y N

ORIGINAL

SAMPLER NAME AND SIGNATURE

PRINT Name of SAMPLER: ALEX SVENDSEN

SIGNATURE of SAMPLER: [signature] DATE Signed (MM/DD/YY): 7/13/11

Temp in °C | Received on Ice (Y/N) | Custody Sealed Cooler (Y/N) | Samples Intact (Y/N)

*Important Note: By signing this form you are accepting Pace's NET 30 day payment terms and agreeing to late charges of 1.5% per month for any invoices not paid within 30 days.

F-ALL-Q-020rev.07, 15-May-2007

Sample Condition Upon Receipt

Pace Analytical

Client Name: HERRERA MDEQ Project # 10163606

Courier: ☒ Fed Ex ☐ UPS ☐ USPS ☐ Client ☐ Commercial ☐ Pace Other _____

Tracking #: 8797184 1000525

Custody Seal on Cooler/Box Present: ☒ yes ☐ no Seals intact: ☒ yes ☐ no

Packing Material: ☐ Bubble Wrap ☒ Bubble Bags ☐ None ☐ Other _____ Temp Blank: Yes ____ No ☒

Thermometer Used 1383045 or 135 Type of Ice: (Wet) Blue None ☒ Samples on ice, cooling process has begun

Cooler Temperature 5.3 Biological Tissue is Frozen: Yes No

Temp should be above freezing to 6°C

Comments:

Date and Initials of person examining contents: RLW 7/16/11

Chain of Custody Present:	☒Yes ☐No ☐N/A	1.
Chain of Custody Filled Out:	☒Yes ☐No ☐N/A	2.
Chain of Custody Relinquished:	☒Yes ☐No ☐N/A	3.
Sampler Name & Signature on COC:	☒Yes ☐No ☐N/A	4.
Samples Arrived within Hold Time:	☒Yes ☐No ☐N/A	5.
Short Hold Time Analysis (<72hr):	☐Yes ☒No ☐N/A	6.
Rush Turn Around Time Requested:	☐Yes ☒No ☐N/A	7.
Sufficient Volume:	☒Yes ☐No ☐N/A	8.
Correct Containers Used:	☒Yes ☐No ☐N/A	9.
-Pace Containers Used:	☒Yes ☐No ☐N/A	
Containers Intact:	☒Yes ☐No ☐N/A	10.
Filtered volume received for Dissolved tests	☐Yes ☐No ☒N/A	11.
Sample Labels match COC:	☒Yes ☐No ☐N/A	12.
-Includes date/time/ID/Analysis Matrix: Aq/SL		
All containers needing acid/base preservation have been checked. Noncompliance are noted in 13.	☒Yes ☐No ☐N/A	13. ☒ HNO3 ☐ H2SO4 ☐ NaOH ☐ HCl
All containers needing preservation are found to be in compliance with EPA recommendation.	☒Yes ☐No ☐N/A	Samp # 005 (1)
Exceptions: VOA,Coliform, TOC, Oil and Grease, WI-DRO (water)	☐Yes ☒No	Initial when completed RLW / Lot # of added preservative
Samples checked for dechlorination:	☐Yes ☐No ☒N/A	14.
Headspace in VOA Vials (>6mm):	☐Yes ☐No ☒N/A	15.
Trip Blank Present:	☐Yes ☒No ☐N/A	16.
Trip Blank Custody Seals Present	☐Yes ☐No ☒N/A	
Pace Trip Blank Lot # (if purchased): NA		

Client Notification/ Resolution: Field Data Required? Y / N

Person Contacted: _____ Date/Time: _____

Comments/ Resolution: _____

Project Manager Review: _____ **Date:** 7/16/11

Note: Whenever there is a discrepancy affecting North Carolina compliance samples, a copy of this form will be sent to the North Carolina DEHNR Certification Office (i.e out of hold, incorrect preservative, out of temp, incorrect containers)

Pace Analytical Services, Inc.
602 S 25th Street
Billings, MT 591014549
(406)254-7226

August 09, 2011

Kevin Houck
Herrera Environmental Consultants
101 East Broadway, Suite 610
Missoula, MT 59802

RE: Project: Black Pine Mine
Pace Project No.: 10163633

Dear Kevin Houck:
Enclosed are the analytical results for sample(s) received by the laboratory on July 14, 2011. The results relate only to the samples included in this report.

If you have any questions concerning this report, please feel free to contact me.

Sincerely,

Sally Heinje

sally.heinje@pacelabs.com
Project Manager

Enclosures

cc: Devin Clary, Montana Dept. of Environmental Quality
Mark Donner, Trihydro

REPORT OF LABORATORY ANALYSIS

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CERTIFICATIONS

Project: Black Pine Mine
Pace Project No.: 10163633

Minnesota Certification IDs

1700 Elm Street SE Suite 200, Minneapolis, MN 55414
A2LA Certification #: 2926.01
Alaska Certification #: UST-078
Alaska Certification #MN00064
Arizona Certification #: AZ-0014
Arkansas Certification #: 88-0680
California Certification #: 01155CA
EPA Region 8 Certification #: Pace
Florida/NELAP Certification #: E87605
Georgia Certification #: 959
Idaho Certification #: MN00064
Illinois Certification #: 200011
Iowa Certification #: 368
Kansas Certification #: E-10167
Louisiana Certification #: 03086
Louisiana Certification #: LA080009
Maine Certification #: 2007029
Maryland Certification #: 322
Michigan DEQ Certification #: 9909
Minnesota Certification #: 027-053-137
Mississippi Certification #: Pace
Montana Certification #: MT CERT0092
Nebraska Certification #: Pace
Nevada Certification #: MN_00064
New Jersey Certification #: MN-002
New Mexico Certification #: Pace
New York Certification #: 11647
North Carolina Certification #: 530
North Dakota Certification #: R-036
North Dakota Certification #: R-036A
Ohio VAP Certification #: CL101
Oklahoma Certification #: D9921
Oklahoma Certification #: 9507
Oregon Certification #: MN200001
Pennsylvania Certification #: 68-00563
Puerto Rico Certification
Tennessee Certification #: 02818
Texas Certification #: T104704192
Washington Certification #: C754
Wisconsin Certification #: 999407970

Montana Certification IDs

602 South 25th Street, Billings, MT 59101
EPA Region 8 Certification #: 8TMS-Q
Idaho Certification #: MT00012
Montana Certification #: MT CERT0040
NVLAP Certification #: 101292-0
Minnesota Dept of Health Certification #: 030-999-442

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SAMPLE SUMMARY

Project: Black Pine Mine
Pace Project No.: 10163633

Lab ID	Sample ID	Matrix	Date Collected	Date Received
10163633001	**BP-HM-RS-07-01**	Solid	07/13/11 15:20	07/14/11 21:00
10163633002	**BP-HM-RS-06-01**	Solid	07/13/11 15:50	07/14/11 21:00
10163633003	**BP-HM-RS-05-02**	Solid	07/13/11 16:20	07/14/11 21:00
10163633004	**BP-HM-RS-05-05**	Solid	07/13/11 16:15	07/14/11 21:00
10163633005	**BP-HM-SS-07-03**	Solid	07/13/11 15:27	07/14/11 21:00
10163633006	**BP-HM-RS-06-08**	Solid	07/13/11 16:10	07/14/11 21:00
10163633007	**BP-CMN-SS-05-08**	Solid	07/14/11 10:00	07/14/11 21:00
10163633008	**BP-CMN-RS-05-05**	Solid	07/14/11 10:05	07/14/11 21:00
10163633009	**BP-CMN-SS-05-00**	Solid	07/14/11 10:10	07/14/11 21:00
10163633010	**BP-CMN-SS-06-06**	Solid	07/14/11 11:15	07/14/11 21:00
10163633011	**BP-CMN-RS-06-02**	Solid	07/14/11 11:20	07/14/11 21:00
10163633012	**BP-CMN-RS-06-00**	Solid	07/14/11 11:25	07/14/11 21:00

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SAMPLE ANALYTE COUNT

Project: Black Pine Mine
Pace Project No.: 10163633

Lab ID	Sample ID	Method	Analysts	Analytes Reported	Laboratory
10163633001	**BP-HM-RS-07-01**	EPA 6020	TL1	12	PASI-M
		EPA 7471	TEM	1	PASI-M
		% Moisture	JDL	1	PASI-M
		Modified Sobek 3.2	JH1	1	PASI-MT
		Modified Sobek 3.2	JH1	5	PASI-MT
		Modified Sobek 3.2	JH1	4	PASI-MT
		Modified Sobek 3.2	JH1	1	PASI-MT
10163633002	**BP-HM-RS-06-01**	EPA 6020	TL1	12	PASI-M
		EPA 7471	TEM	1	PASI-M
		% Moisture	JDL	1	PASI-M
		Modified Sobek 3.2	JH1	1	PASI-MT
		Modified Sobek 3.2	JH1	5	PASI-MT
		Modified Sobek 3.2	JH1	4	PASI-MT
		Modified Sobek 3.2	JH1	1	PASI-MT
10163633003	**BP-HM-RS-05-02**	EPA 6020	TL1	12	PASI-M
		EPA 7471	TEM	1	PASI-M
		% Moisture	JDL	1	PASI-M
		Modified Sobek 3.2	JH1	1	PASI-MT
		Modified Sobek 3.2	JH1	5	PASI-MT
		Modified Sobek 3.2	JH1	4	PASI-MT
		Modified Sobek 3.2	JH1	1	PASI-MT
10163633004	**BP-HM-RS-05-05**	EPA 6020	TL1	12	PASI-M
		EPA 7471	TEM	1	PASI-M
		% Moisture	JDL	1	PASI-M
10163633005	**BP-HM-SS-07-03**	EPA 6020	TL1	12	PASI-M
		EPA 7471	TEM	1	PASI-M
		% Moisture	JDL	1	PASI-M
10163633006	**BP-HM-RS-06-08**	EPA 6020	TL1	12	PASI-M
		EPA 7471	TEM	1	PASI-M
		% Moisture	JDL	1	PASI-M
10163633007	**BP-CMN-SS-05-08**	EPA 6020	TL1	12	PASI-M
		EPA 7471	TEM	1	PASI-M
		% Moisture	JDL	1	PASI-M
10163633008	**BP-CMN-RS-05-05**	EPA 6020	TL1	12	PASI-M
		EPA 7471	TEM	1	PASI-M
		% Moisture	JDL	1	PASI-M
		Modified Sobek 3.2	JH1	1	PASI-MT

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SAMPLE ANALYTE COUNT

Project: Black Pine Mine
Pace Project No.: 10163633

Lab ID	Sample ID	Method	Analysts	Analytes Reported	Laboratory
		Modified Sobek 3.2	JH1	5	PASI-MT
		Modified Sobek 3.2	JH1	4	PASI-MT
		Modified Sobek 3.2	JH1	1	PASI-MT
10163633009	**BP-CMN-SS-05-00**	EPA 6020	TL1	12	PASI-M
		EPA 7471	TEM	1	PASI-M
		% Moisture	JDL	1	PASI-M
		Modified Sobek 3.2	JH1	1	PASI-MT
		Modified Sobek 3.2	JH1	5	PASI-MT
		Modified Sobek 3.2	JH1	4	PASI-MT
		Modified Sobek 3.2	JH1	1	PASI-MT
10163633010	**BP-CMN-SS-06-06**	EPA 6020	TL1	12	PASI-M
		EPA 7471	TEM	1	PASI-M
		% Moisture	JDL	1	PASI-M
10163633011	**BP-CMN-RS-06-02**	EPA 6020	TL1	12	PASI-M
		EPA 7471	TEM	1	PASI-M
		% Moisture	JDL	1	PASI-M
		Modified Sobek 3.2	JH1	1	PASI-MT
		Modified Sobek 3.2	JH1	5	PASI-MT
		Modified Sobek 3.2	JH1	4	PASI-MT
		Modified Sobek 3.2	JH1	1	PASI-MT
10163633012	**BP-CMN-RS-06-00**	EPA 6020	TL1	12	PASI-M
		EPA 7471	TEM	1	PASI-M
		% Moisture	JDL	1	PASI-M
		Modified Sobek 3.2	JH1	1	PASI-MT
		Modified Sobek 3.2	JH1	5	PASI-MT
		Modified Sobek 3.2	JH1	4	PASI-MT
		Modified Sobek 3.2	JH1	1	PASI-MT

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PROJECT NARRATIVE

Project: Black Pine Mine
Pace Project No.: 10163633

Method: **EPA 6020**
Description: 6020 MET ICPMS
Client: Montana Dept. of Environmental Quality
Date: August 09, 2011

General Information:
12 samples were analyzed for EPA 6020. All samples were received in acceptable condition with any exceptions noted below.

Hold Time:
The samples were analyzed within the method required hold times with any exceptions noted below.

Sample Preparation:
The samples were prepared in accordance with EPA 3050 with any exceptions noted below.

Initial Calibrations (including MS Tune as applicable):
All criteria were within method requirements with any exceptions noted below.

Continuing Calibration:
All criteria were within method requirements with any exceptions noted below.

Internal Standards:
All internal standards were within QC limits with any exceptions noted below.

Method Blank:
All analytes were below the report limit in the method blank with any exceptions noted below.

Laboratory Control Spike:
All laboratory control spike compounds were within QC limits with any exceptions noted below.

Matrix Spikes:
All percent recoveries and relative percent differences (RPDs) were within acceptance criteria with any exceptions noted below.

QC Batch: MPRP/27166

A matrix spike and matrix spike duplicate (MS/MSD) were performed on the following sample(s): 10163633001,10163633011

M6: Matrix spike and Matrix spike duplicate recovery not evaluated against control limits due to sample dilution.

- MS (Lab ID: 1014850)
  - Antimony
  - Arsenic
  - Barium
  - Cadmium
  - Chromium
  - Copper
  - Iron
  - Lead
  - Manganese
  - Nickel
  - Silver
  - Zinc
- MS (Lab ID: 1014852)

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PROJECT NARRATIVE

Project: Black Pine Mine
Pace Project No.: 10163633

Method: **EPA 6020**
Description: 6020 MET ICPMS
Client: Montana Dept. of Environmental Quality
Date: August 09, 2011

QC Batch: MPRP/27166

A matrix spike and matrix spike duplicate (MS/MSD) were performed on the following sample(s): 10163633001,10163633011

M6: Matrix spike and Matrix spike duplicate recovery not evaluated against control limits due to sample dilution.

- Antimony
- Arsenic
- Barium
- Cadmium
- Chromium
- Copper
- Iron
- Lead
- Manganese
- Nickel
- Silver
- Zinc

- MSD (Lab ID: 1014851)
  - Antimony
  - Arsenic
  - Barium
  - Cadmium
  - Chromium
  - Copper
  - Iron
  - Lead
  - Manganese
  - Nickel
  - Silver
  - Zinc

Duplicate Sample:
All duplicate sample results were within method acceptance criteria with any exceptions noted below.

Additional Comments:

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PROJECT NARRATIVE

Project: Black Pine Mine
Pace Project No.: 10163633

Method: **EPA 7471**
Description: 7471 Mercury
Client: Montana Dept. of Environmental Quality
Date: August 09, 2011

General Information:
12 samples were analyzed for EPA 7471. All samples were received in acceptable condition with any exceptions noted below.

Hold Time:
The samples were analyzed within the method required hold times with any exceptions noted below.

Sample Preparation:
The samples were prepared in accordance with EPA 7471 with any exceptions noted below.

Initial Calibrations (including MS Tune as applicable):
All criteria were within method requirements with any exceptions noted below.

Continuing Calibration:
All criteria were within method requirements with any exceptions noted below.

Method Blank:
All analytes were below the report limit in the method blank with any exceptions noted below.

Laboratory Control Spike:
All laboratory control spike compounds were within QC limits with any exceptions noted below.

Matrix Spikes:
All percent recoveries and relative percent differences (RPDs) were within acceptance criteria with any exceptions noted below.

QC Batch: MERP/5649

A matrix spike and matrix spike duplicate (MS/MSD) were performed on the following sample(s): 10163633001,10163634008

M1: Matrix spike recovery exceeded QC limits. Batch accepted based on laboratory control sample (LCS) recovery.

- MS (Lab ID: 1016606)
  - Mercury

M6: Matrix spike and Matrix spike duplicate recovery not evaluated against control limits due to sample dilution.

- MS (Lab ID: 1016604)
  - Mercury
- MSD (Lab ID: 1016605)
  - Mercury

Duplicate Sample:
All duplicate sample results were within method acceptance criteria with any exceptions noted below.

Additional Comments:

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PROJECT NARRATIVE

Project: Black Pine Mine
Pace Project No.: 10163633

Method: **Modified Sobek 3.2**
Description: Sobek Acid Base Potential
Client: Montana Dept. of Environmental Quality
Date: August 09, 2011

General Information:
7 samples were analyzed for Modified Sobek 3.2. All samples were received in acceptable condition with any exceptions noted below.

Hold Time:
The samples were analyzed within the method required hold times with any exceptions noted below.

Initial Calibrations (including MS Tune as applicable):
All criteria were within method requirements with any exceptions noted below.

Continuing Calibration:
All criteria were within method requirements with any exceptions noted below.

Internal Standards:
All internal standards were within QC limits with any exceptions noted below.

Surrogates:
All surrogates were within QC limits with any exceptions noted below.

Method Blank:
All analytes were below the report limit in the method blank with any exceptions noted below.

Laboratory Control Spike:
All laboratory control spike compounds were within QC limits with any exceptions noted below.

Matrix Spikes:
All percent recoveries and relative percent differences (RPDs) were within acceptance criteria with any exceptions noted below.

Duplicate Sample:
All duplicate sample results were within method acceptance criteria with any exceptions noted below.

Additional Comments:

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PROJECT NARRATIVE

Project: Black Pine Mine
Pace Project No.: 10163633

Method: **Modified Sobek 3.2**
Description: Sobek Extractable Sulfur
Client: Montana Dept. of Environmental Quality
Date: August 09, 2011

General Information:
7 samples were analyzed for Modified Sobek 3.2. All samples were received in acceptable condition with any exceptions noted below.

Hold Time:
The samples were analyzed within the method required hold times with any exceptions noted below.

Initial Calibrations (including MS Tune as applicable):
All criteria were within method requirements with any exceptions noted below.

Continuing Calibration:
All criteria were within method requirements with any exceptions noted below.

Internal Standards:
All internal standards were within QC limits with any exceptions noted below.

Surrogates:
All surrogates were within QC limits with any exceptions noted below.

Method Blank:
All analytes were below the report limit in the method blank with any exceptions noted below.

Laboratory Control Spike:
All laboratory control spike compounds were within QC limits with any exceptions noted below.

Matrix Spikes:
All percent recoveries and relative percent differences (RPDs) were within acceptance criteria with any exceptions noted below.

Duplicate Sample:
All duplicate sample results were within method acceptance criteria with any exceptions noted below.

Additional Comments:

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PROJECT NARRATIVE

Project: Black Pine Mine
Pace Project No.: 10163633

Method: **Modified Sobek 3.2**
Description: Sobek Calculations
Client: Montana Dept. of Environmental Quality
Date: August 09, 2011

General Information:
7 samples were analyzed for Modified Sobek 3.2. All samples were received in acceptable condition with any exceptions noted below.

Hold Time:
The samples were analyzed within the method required hold times with any exceptions noted below.

Initial Calibrations (including MS Tune as applicable):
All criteria were within method requirements with any exceptions noted below.

Continuing Calibration:
All criteria were within method requirements with any exceptions noted below.

Internal Standards:
All internal standards were within QC limits with any exceptions noted below.

Surrogates:
All surrogates were within QC limits with any exceptions noted below.

Method Blank:
All analytes were below the report limit in the method blank with any exceptions noted below.

Laboratory Control Spike:
All laboratory control spike compounds were within QC limits with any exceptions noted below.

Matrix Spikes:
All percent recoveries and relative percent differences (RPDs) were within acceptance criteria with any exceptions noted below.

Duplicate Sample:
All duplicate sample results were within method acceptance criteria with any exceptions noted below.

Additional Comments:

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PROJECT NARRATIVE

Project: Black Pine Mine
Pace Project No.: 10163633

Method: **Modified Sobek 3.2**
Description: Sobek SMP Buffer pH
Client: Montana Dept. of Environmental Quality
Date: August 09, 2011

General Information:
7 samples were analyzed for Modified Sobek 3.2. All samples were received in acceptable condition with any exceptions noted below.

Hold Time:
The samples were analyzed within the method required hold times with any exceptions noted below.

Initial Calibrations (including MS Tune as applicable):
All criteria were within method requirements with any exceptions noted below.

Continuing Calibration:
All criteria were within method requirements with any exceptions noted below.

Internal Standards:
All internal standards were within QC limits with any exceptions noted below.

Surrogates:
All surrogates were within QC limits with any exceptions noted below.

Method Blank:
All analytes were below the report limit in the method blank with any exceptions noted below.

Laboratory Control Spike:
All laboratory control spike compounds were within QC limits with any exceptions noted below.

Matrix Spikes:
All percent recoveries and relative percent differences (RPDs) were within acceptance criteria with any exceptions noted below.

Duplicate Sample:
All duplicate sample results were within method acceptance criteria with any exceptions noted below.

Additional Comments:

This data package has been reviewed for quality and completeness and is approved for release.

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ANALYTICAL RESULTS

Project: Black Pine Mine
Pace Project No.: 10163633

Sample: BP-HM-RS-07-01 **Lab ID: 10163633001** Collected: 07/13/11 15:20 Received: 07/14/11 21:00 Matrix: Solid

Results reported on a "dry-weight" basis

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
6020 MET ICPMS	Analytical Method: EPA 6020 Preparation Method: EPA 3050							
Antimony	**1380**	mg/kg	2.8	100	08/01/11 15:37	08/03/11 15:58	7440-36-0	M6
Arsenic	**1380**	mg/kg	2.8	100	08/01/11 15:37	08/03/11 15:58	7440-38-2	M6
Barium	**247**	mg/kg	1.7	100	08/01/11 15:37	08/03/11 15:58	7440-39-3	M6
Cadmium	**20.6**	mg/kg	0.45	100	08/01/11 15:37	08/03/11 15:58	7440-43-9	M6
Chromium	**2.7**	mg/kg	0.56	20	08/01/11 15:37	08/03/11 15:55	7440-47-3	M6
Copper	**1280**	mg/kg	2.8	100	08/01/11 15:37	08/03/11 15:58	7440-50-8	M6
Iron	**23100**	mg/kg	281	100	08/01/11 15:37	08/03/11 15:58	7439-89-6	M6
Lead	**6960**	mg/kg	2.2	400	08/01/11 15:37	08/04/11 13:35	7439-92-1	M6
Manganese	**270**	mg/kg	2.8	100	08/01/11 15:37	08/03/11 15:58	7439-96-5	M6
Nickel	**<2.8**	mg/kg	2.8	100	08/01/11 15:37	08/03/11 15:58	7440-02-0	M6
Silver	**319**	mg/kg	2.8	100	08/01/11 15:37	08/03/11 15:58	7440-22-4	M6
Zinc	**332**	mg/kg	28.1	100	08/01/11 15:37	08/03/11 15:58	7440-66-6	M6
7471 Mercury	Analytical Method: EPA 7471 Preparation Method: EPA 7471							
Mercury	**7.0**	mg/kg	0.22	10	07/28/11 19:18	08/01/11 15:33	7439-97-6	M6
Dry Weight	Analytical Method: % Moisture							
Percent Moisture	**11.0**	%	0.10	1		07/22/11 00:00		
Sobek Acid Base Potential	Analytical Method: Modified Sobek 3.2							
Neutralization Potential	**<0.5**	tons/1000	0.50	1		08/02/11 00:00		
Sobek Extractable Sulfur	Analytical Method: Modified Sobek 3.2							
Sulfur, HCl Extractable	**0.0937**	% (w/w)	0.050	1		08/01/11 15:50		
Sulfur, HNO3 Extractable	**0.0559**	% (w/w)	0.050	1		08/01/11 15:50		
Sulfur, Hot Water Extractable	**0.183**	% (w/w)	0.050	1		08/01/11 15:50		
Sulfur, Residual	**<0.050**	% (w/w)	0.050	1		08/01/11 15:50		
Total Sulfur	**0.339**	% (w/w)	0.050	1		08/01/11 15:50		
Sobek Calculations	Analytical Method: Modified Sobek 3.2							
Acid/Base Potential	**0**	tons/1000		1		08/02/11 00:00		
Acid Potential	**<4.3**	tons/1000	4.3	1		08/02/11 00:00		
Lime Requirement	**11**	tons/1000	5.4	1		08/02/11 00:00		
SMP Lime Requirement	**4.6**	tons/1000	0.0	1		08/02/11 00:00		
Sobek SMP Buffer pH	Analytical Method: Modified Sobek 3.2							
SMP Buffer pH	**6.3**	Std. Units	0.10	1		07/26/11 09:40		

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ANALYTICAL RESULTS

Project: Black Pine Mine
Pace Project No.: 10163633

Sample: BP-HM-RS-06-01 **Lab ID: 10163633002** Collected: 07/13/11 15:50 Received: 07/14/11 21:00 Matrix: Solid

Results reported on a "dry-weight" basis

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
6020 MET ICPMS	Analytical Method: EPA 6020 Preparation Method: EPA 3050							
Antimony	**1020**	mg/kg	9.9	400	08/01/11 15:37	08/03/11 16:04	7440-36-0	
Arsenic	**1190**	mg/kg	9.9	400	08/01/11 15:37	08/03/11 16:04	7440-38-2	
Barium	**261**	mg/kg	0.30	20	08/01/11 15:37	08/03/11 16:01	7440-39-3	
Cadmium	**22.8**	mg/kg	1.6	400	08/01/11 15:37	08/03/11 16:04	7440-43-9	
Chromium	**4.1**	mg/kg	0.50	20	08/01/11 15:37	08/03/11 16:01	7440-47-3	
Copper	**3310**	mg/kg	9.9	400	08/01/11 15:37	08/03/11 16:04	7440-50-8	
Iron	**28900**	mg/kg	995	400	08/01/11 15:37	08/03/11 16:04	7439-89-6	
Lead	**4980**	mg/kg	2.0	400	08/01/11 15:37	08/03/11 16:04	7439-92-1	
Manganese	**682**	mg/kg	9.9	400	08/01/11 15:37	08/03/11 16:04	7439-96-5	
Nickel	**<9.9**	mg/kg	9.9	400	08/01/11 15:37	08/03/11 16:04	7440-02-0	
Silver	**175**	mg/kg	0.50	20	08/01/11 15:37	08/03/11 16:01	7440-22-4	
Zinc	**395**	mg/kg	99.5	400	08/01/11 15:37	08/03/11 16:04	7440-66-6	
7471 Mercury	Analytical Method: EPA 7471 Preparation Method: EPA 7471							
Mercury	**0.56**	mg/kg	0.020	1	07/28/11 19:18	08/01/11 15:47	7439-97-6	
Dry Weight	Analytical Method: % Moisture							
Percent Moisture	**7.8**	%	0.10	1		07/22/11 00:00		
Sobek Acid Base Potential	Analytical Method: Modified Sobek 3.2							
Neutralization Potential	**<0.5**	tons/1000	0.50	1		08/02/11 00:00		
Sobek Extractable Sulfur	Analytical Method: Modified Sobek 3.2							
Sulfur, HCl Extractable	**<0.050**	% (w/w)	0.050	1		08/01/11 16:02		
Sulfur, HNO3 Extractable	**<0.050**	% (w/w)	0.050	1		08/01/11 16:02		
Sulfur, Hot Water Extractable	**0.0542**	% (w/w)	0.050	1		08/01/11 16:02		
Sulfur, Residual	**<0.050**	% (w/w)	0.050	1		08/01/11 16:02		
Total Sulfur	**0.0912**	% (w/w)	0.050	1		08/01/11 16:02		
Sobek Calculations	Analytical Method: Modified Sobek 3.2							
Acid/Base Potential	**0**	tons/1000		1		08/02/11 00:00		
Acid Potential	**<4.3**	tons/1000	4.3	1		08/02/11 00:00		
Lime Requirement	**<5.4**	tons/1000	5.4	1		08/02/11 00:00		
SMP Lime Requirement	**0.30**	tons/1000	0.0	1		08/02/11 00:00		
Sobek SMP Buffer pH	Analytical Method: Modified Sobek 3.2							
SMP Buffer pH	**6.9**	Std. Units	0.10	1		07/26/11 09:40		

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ANALYTICAL RESULTS

Project: Black Pine Mine
Pace Project No.: 10163633

Sample: BP-HM-RS-05-02 **Lab ID: 10163633003** Collected: 07/13/11 16:20 Received: 07/14/11 21:00 Matrix: Solid

Results reported on a "dry-weight" basis

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
6020 MET ICPMS	Analytical Method: EPA 6020 Preparation Method: EPA 3050							
Antimony	**50.3**	mg/kg	0.52	20	08/01/11 15:37	08/03/11 16:07	7440-36-0	
Arsenic	**61.3**	mg/kg	10.4	400	08/01/11 15:37	08/03/11 16:11	7440-38-2	
Barium	**153**	mg/kg	0.31	20	08/01/11 15:37	08/03/11 16:07	7440-39-3	
Cadmium	**1.2**	mg/kg	0.083	20	08/01/11 15:37	08/03/11 16:07	7440-43-9	
Chromium	**8.9**	mg/kg	0.52	20	08/01/11 15:37	08/03/11 16:07	7440-47-3	
Copper	**193**	mg/kg	10.4	400	08/01/11 15:37	08/03/11 16:11	7440-50-8	
Iron	**11700**	mg/kg	52.1	20	08/01/11 15:37	08/03/11 16:07	7439-89-6	
Lead	**401**	mg/kg	0.10	20	08/01/11 15:37	08/03/11 16:07	7439-92-1	
Manganese	**465**	mg/kg	0.52	20	08/01/11 15:37	08/03/11 16:07	7439-96-5	
Nickel	**13.7**	mg/kg	10.4	400	08/01/11 15:37	08/03/11 16:11	7440-02-0	
Silver	**7.8**	mg/kg	0.52	20	08/01/11 15:37	08/03/11 16:07	7440-22-4	
Zinc	**<104**	mg/kg	104	400	08/01/11 15:37	08/03/11 16:11	7440-66-6	
7471 Mercury	Analytical Method: EPA 7471 Preparation Method: EPA 7471							
Mercury	**0.094**	mg/kg	0.018	1	07/28/11 19:18	08/01/11 15:49	7439-97-6	
Dry Weight	Analytical Method: % Moisture							
Percent Moisture	**11.9**	%	0.10	1		07/22/11 00:00		
Sobek Acid Base Potential	Analytical Method: Modified Sobek 3.2							
Neutralization Potential	**0.73**	tons/1000	0.50	1		08/02/11 00:00		
Sobek Extractable Sulfur	Analytical Method: Modified Sobek 3.2							
Sulfur, HCl Extractable	**<0.050**	% (w/w)	0.050	1		08/01/11 16:16		
Sulfur, HNO3 Extractable	**<0.050**	% (w/w)	0.050	1		08/01/11 16:16		
Sulfur, Hot Water Extractable	**<0.050**	% (w/w)	0.050	1		08/01/11 16:16		
Sulfur, Residual	**<0.050**	% (w/w)	0.050	1		08/01/11 16:16		
Total Sulfur	**<0.050**	% (w/w)	0.050	1		08/01/11 16:16		
Sobek Calculations	Analytical Method: Modified Sobek 3.2							
Acid/Base Potential	**0.73**	tons/1000		1		08/02/11 00:00		
Acid Potential	**<4.3**	tons/1000	4.3	1		08/02/11 00:00		
Lime Requirement	**<5.4**	tons/1000	5.4	1		08/02/11 00:00		
SMP Lime Requirement	**0.30**	tons/1000	0.0	1		08/02/11 00:00		
Sobek SMP Buffer pH	Analytical Method: Modified Sobek 3.2							
SMP Buffer pH	**6.9**	Std. Units	0.10	1		07/26/11 09:40		

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ANALYTICAL RESULTS

Project: Black Pine Mine
Pace Project No.: 10163633

Sample: BP-HM-RS-05-05 **Lab ID: 10163633004** Collected: 07/13/11 16:15 Received: 07/14/11 21:00 Matrix: Solid

Results reported on a "dry-weight" basis

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
6020 MET ICPMS	Analytical Method: EPA 6020 Preparation Method: EPA 3050							
Antimony	**18.1**	mg/kg	0.52	20	08/01/11 15:37	08/03/11 16:33	7440-36-0	
Arsenic	**22.4**	mg/kg	0.52	20	08/01/11 15:37	08/03/11 16:33	7440-38-2	
Barium	**77.8**	mg/kg	0.31	20	08/01/11 15:37	08/03/11 16:33	7440-39-3	
Cadmium	**0.91**	mg/kg	0.084	20	08/01/11 15:37	08/03/11 16:33	7440-43-9	
Chromium	**7.7**	mg/kg	0.52	20	08/01/11 15:37	08/03/11 16:33	7440-47-3	
Copper	**57.9**	mg/kg	0.52	20	08/01/11 15:37	08/03/11 16:33	7440-50-8	
Iron	**9340**	mg/kg	52.4	20	08/01/11 15:37	08/03/11 16:33	7439-89-6	
Lead	**149**	mg/kg	0.10	20	08/01/11 15:37	08/03/11 16:33	7439-92-1	
Manganese	**197**	mg/kg	0.52	20	08/01/11 15:37	08/03/11 16:33	7439-96-5	
Nickel	**8.5**	mg/kg	0.52	20	08/01/11 15:37	08/03/11 16:33	7440-02-0	
Silver	**3.7**	mg/kg	0.52	20	08/01/11 15:37	08/03/11 16:33	7440-22-4	
Zinc	**26.2**	mg/kg	5.2	20	08/01/11 15:37	08/03/11 16:33	7440-66-6	
7471 Mercury	Analytical Method: EPA 7471 Preparation Method: EPA 7471							
Mercury	**0.059**	mg/kg	0.021	1	07/28/11 19:18	08/01/11 15:51	7439-97-6	
Dry Weight	Analytical Method: % Moisture							
Percent Moisture	**9.2**	%	0.10	1		07/22/11 00:00		

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ANALYTICAL RESULTS

Project: Black Pine Mine
Pace Project No.: 10163633

Sample: BP-HM-SS-07-03 **Lab ID: 10163633005** Collected: 07/13/11 15:27 Received: 07/14/11 21:00 Matrix: Solid

Results reported on a "dry-weight" basis

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
6020 MET ICPMS	Analytical Method: EPA 6020 Preparation Method: EPA 3050							
Antimony	**142**	mg/kg	0.55	20	08/01/11 15:37	08/03/11 16:40	7440-36-0	
Arsenic	**154**	mg/kg	0.55	20	08/01/11 15:37	08/03/11 16:40	7440-38-2	
Barium	**433**	mg/kg	0.33	20	08/01/11 15:37	08/03/11 16:40	7440-39-3	
Cadmium	**5.9**	mg/kg	0.089	20	08/01/11 15:37	08/03/11 16:40	7440-43-9	
Chromium	**7.0**	mg/kg	0.55	20	08/01/11 15:37	08/03/11 16:40	7440-47-3	
Copper	**3440**	mg/kg	11.1	400	08/01/11 15:37	08/04/11 13:38	7440-50-8	
Iron	**12300**	mg/kg	55.4	20	08/01/11 15:37	08/03/11 16:40	7439-89-6	
Lead	**1020**	mg/kg	0.55	100	08/01/11 15:37	08/03/11 16:43	7439-92-1	
Manganese	**2320**	mg/kg	2.8	100	08/01/11 15:37	08/03/11 16:43	7439-96-5	
Nickel	**10.9**	mg/kg	0.55	20	08/01/11 15:37	08/03/11 16:40	7440-02-0	
Silver	**26.5**	mg/kg	0.55	20	08/01/11 15:37	08/03/11 16:40	7440-22-4	
Zinc	**124**	mg/kg	5.5	20	08/01/11 15:37	08/03/11 16:40	7440-66-6	
7471 Mercury	Analytical Method: EPA 7471 Preparation Method: EPA 7471							
Mercury	**8.5**	mg/kg	0.25	10	07/28/11 19:18	08/01/11 16:02	7439-97-6	
Dry Weight	Analytical Method: % Moisture							
Percent Moisture	**21.5**	%	0.10	1		07/22/11 00:00		

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: Black Pine Mine
Pace Project No.: 10163633

Sample: BP-HM-RS-06-08 **Lab ID: 10163633006** Collected: 07/13/11 16:10 Received: 07/14/11 21:00 Matrix: Solid

Results reported on a "dry-weight" basis

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
6020 MET ICPMS	Analytical Method: EPA 6020 Preparation Method: EPA 3050							
Antimony	**188**	mg/kg	0.50	20	08/01/11 15:37	08/03/11 16:46	7440-36-0	
Arsenic	**209**	mg/kg	10	400	08/01/11 15:37	08/03/11 16:49	7440-38-2	
Barium	**155**	mg/kg	0.30	20	08/01/11 15:37	08/03/11 16:46	7440-39-3	
Cadmium	**4.0**	mg/kg	0.080	20	08/01/11 15:37	08/03/11 16:46	7440-43-9	
Chromium	**12.2**	mg/kg	0.50	20	08/01/11 15:37	08/03/11 16:46	7440-47-3	
Copper	**441**	mg/kg	10	400	08/01/11 15:37	08/03/11 16:49	7440-50-8	
Iron	**21000**	mg/kg	50.0	20	08/01/11 15:37	08/03/11 16:46	7439-89-6	
Lead	**1500**	mg/kg	2.0	400	08/01/11 15:37	08/03/11 16:49	7439-92-1	
Manganese	**282**	mg/kg	0.50	20	08/01/11 15:37	08/03/11 16:46	7439-96-5	
Nickel	**14.9**	mg/kg	10	400	08/01/11 15:37	08/03/11 16:49	7440-02-0	
Silver	**22.1**	mg/kg	0.50	20	08/01/11 15:37	08/03/11 16:46	7440-22-4	
Zinc	**<100**	mg/kg	100	400	08/01/11 15:37	08/03/11 16:49	7440-66-6	
7471 Mercury	Analytical Method: EPA 7471 Preparation Method: EPA 7471							
Mercury	**0.040**	mg/kg	0.022	1	07/28/11 19:18	08/01/11 16:04	7439-97-6	
Dry Weight	Analytical Method: % Moisture							
Percent Moisture	**9.9**	%	0.10	1		07/22/11 00:00		

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ANALYTICAL RESULTS

Project: Black Pine Mine
Pace Project No.: 10163633

Sample: BP-CMN-SS-05-08 **Lab ID: 10163633007** Collected: 07/14/11 10:00 Received: 07/14/11 21:00 Matrix: Solid

Results reported on a "dry-weight" basis

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
6020 MET ICPMS	Analytical Method: EPA 6020 Preparation Method: EPA 3050							
Antimony	**1.4**	mg/kg	0.50	20	08/01/11 15:37	08/03/11 16:52	7440-36-0	
Arsenic	**7.7**	mg/kg	0.50	20	08/01/11 15:37	08/03/11 16:52	7440-38-2	
Barium	**97.0**	mg/kg	0.30	20	08/01/11 15:37	08/03/11 16:52	7440-39-3	
Cadmium	**<0.080**	mg/kg	0.080	20	08/01/11 15:37	08/03/11 16:52	7440-43-9	
Chromium	**6.7**	mg/kg	0.50	20	08/01/11 15:37	08/03/11 16:52	7440-47-3	
Copper	**8.7**	mg/kg	0.50	20	08/01/11 15:37	08/03/11 16:52	7440-50-8	
Iron	**7960**	mg/kg	50.1	20	08/01/11 15:37	08/03/11 16:52	7439-89-6	
Lead	**14.9**	mg/kg	0.10	20	08/01/11 15:37	08/03/11 16:52	7439-92-1	
Manganese	**137**	mg/kg	0.50	20	08/01/11 15:37	08/03/11 16:52	7439-96-5	
Nickel	**5.8**	mg/kg	0.50	20	08/01/11 15:37	08/03/11 16:52	7440-02-0	
Silver	**<0.50**	mg/kg	0.50	20	08/01/11 15:37	08/03/11 16:52	7440-22-4	
Zinc	**25.7**	mg/kg	5.0	20	08/01/11 15:37	08/03/11 16:52	7440-66-6	
7471 Mercury	Analytical Method: EPA 7471 Preparation Method: EPA 7471							
Mercury	**<0.022**	mg/kg	0.022	1	07/28/11 19:18	08/01/11 16:06	7439-97-6	
Dry Weight	Analytical Method: % Moisture							
Percent Moisture	**11.8**	%	0.10	1		07/22/11 00:00		

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ANALYTICAL RESULTS

Project: Black Pine Mine
Pace Project No.: 10163633

Sample: BP-CMN-RS-05-05 **Lab ID: 10163633008** Collected: 07/14/11 10:05 Received: 07/14/11 21:00 Matrix: Solid

Results reported on a "dry-weight" basis

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
6020 MET ICPMS	Analytical Method: EPA 6020 Preparation Method: EPA 3050							
Antimony	**678**	mg/kg	2.7	100	08/01/11 15:37	08/03/11 17:02	7440-36-0	
Arsenic	**467**	mg/kg	2.7	100	08/01/11 15:37	08/03/11 17:02	7440-38-2	
Barium	**244**	mg/kg	0.32	20	08/01/11 15:37	08/03/11 16:59	7440-39-3	
Cadmium	**13.7**	mg/kg	0.086	20	08/01/11 15:37	08/03/11 16:59	7440-43-9	
Chromium	**3.0**	mg/kg	2.7	100	08/01/11 15:37	08/03/11 17:02	7440-47-3	
Copper	**1950**	mg/kg	2.7	100	08/01/11 15:37	08/03/11 17:02	7440-50-8	
Iron	**12500**	mg/kg	269	100	08/01/11 15:37	08/03/11 17:02	7439-89-6	
Lead	**3050**	mg/kg	2.2	400	08/01/11 15:37	08/04/11 13:42	7439-92-1	
Manganese	**850**	mg/kg	2.7	100	08/01/11 15:37	08/03/11 17:02	7439-96-5	
Nickel	**4.4**	mg/kg	2.7	100	08/01/11 15:37	08/03/11 17:02	7440-02-0	
Silver	**69.0**	mg/kg	0.54	20	08/01/11 15:37	08/03/11 16:59	7440-22-4	
Zinc	**923**	mg/kg	26.9	100	08/01/11 15:37	08/03/11 17:02	7440-66-6	
7471 Mercury	Analytical Method: EPA 7471 Preparation Method: EPA 7471							
Mercury	**0.27**	mg/kg	0.018	1	07/28/11 19:18	08/01/11 16:08	7439-97-6	
Dry Weight	Analytical Method: % Moisture							
Percent Moisture	**7.9**	%	0.10	1		07/22/11 00:00		
Sobek Acid Base Potential	Analytical Method: Modified Sobek 3.2							
Neutralization Potential	**6.1**	tons/1000	0.50	1		08/02/11 00:00		
Sobek Extractable Sulfur	Analytical Method: Modified Sobek 3.2							
Sulfur, HCl Extractable	**<0.050**	% (w/w)	0.050	1		08/02/11 08:16		
Sulfur, HNO3 Extractable	**0.134**	% (w/w)	0.050	1		08/02/11 08:16		
Sulfur, Hot Water Extractable	**0.237**	% (w/w)	0.050	1		08/02/11 08:16		
Sulfur, Residual	**<0.050**	% (w/w)	0.050	1		08/02/11 08:16		
Total Sulfur	**0.369**	% (w/w)	0.050	1		08/02/11 08:16		
Sobek Calculations	Analytical Method: Modified Sobek 3.2							
Acid/Base Potential	**1.6**	tons/1000		1		08/02/11 00:00		
Acid Potential	**4.4**	tons/1000	4.3	1		08/02/11 00:00		
Lime Requirement	**5.6**	tons/1000	5.4	1		08/02/11 00:00		
SMP Lime Requirement	**0**	tons/1000	0.0	1		08/02/11 00:00		
Sobek SMP Buffer pH	Analytical Method: Modified Sobek 3.2							
SMP Buffer pH	**7.4**	Std. Units	0.10	1		07/26/11 09:40		

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ANALYTICAL RESULTS

Project: Black Pine Mine
Pace Project No.: 10163633

Sample: BP-CMN-SS-05-00 **Lab ID: 10163633009** Collected: 07/14/11 10:10 Received: 07/14/11 21:00 Matrix: Solid

Results reported on a "dry-weight" basis

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
6020 MET ICPMS	Analytical Method: EPA 6020 Preparation Method: EPA 3050							
Antimony	**20.2**	mg/kg	0.45	20	08/01/11 15:37	08/03/11 17:15	7440-36-0	
Arsenic	**26.1**	mg/kg	0.45	20	08/01/11 15:37	08/03/11 17:15	7440-38-2	
Barium	**298**	mg/kg	0.27	20	08/01/11 15:37	08/03/11 17:15	7440-39-3	
Cadmium	**0.37**	mg/kg	0.072	20	08/01/11 15:37	08/03/11 17:15	7440-43-9	
Chromium	**4.8**	mg/kg	0.45	20	08/01/11 15:37	08/03/11 17:15	7440-47-3	
Copper	**73.6**	mg/kg	0.45	20	08/01/11 15:37	08/03/11 17:15	7440-50-8	
Iron	**8450**	mg/kg	44.8	20	08/01/11 15:37	08/03/11 17:15	7439-89-6	
Lead	**282**	mg/kg	0.090	20	08/01/11 15:37	08/03/11 17:15	7439-92-1	
Manganese	**928**	mg/kg	9.0	400	08/01/11 15:37	08/03/11 17:18	7439-96-5	
Nickel	**4.9**	mg/kg	0.45	20	08/01/11 15:37	08/03/11 17:15	7440-02-0	
Silver	**1.0**	mg/kg	0.45	20	08/01/11 15:37	08/03/11 17:15	7440-22-4	
Zinc	**88.0**	mg/kg	4.5	20	08/01/11 15:37	08/03/11 17:15	7440-66-6	
7471 Mercury	Analytical Method: EPA 7471 Preparation Method: EPA 7471							
Mercury	**<0.021**	mg/kg	0.021	1	07/28/11 19:18	08/01/11 16:11	7439-97-6	
Dry Weight	Analytical Method: % Moisture							
Percent Moisture	**11.5**	%	0.10	1		07/22/11 00:00		
Sobek Acid Base Potential	Analytical Method: Modified Sobek 3.2							
Neutralization Potential	**<0.5**	tons/1000	0.50	1		08/02/11 00:00		
Sobek Extractable Sulfur	Analytical Method: Modified Sobek 3.2							
Sulfur, HCl Extractable	**<0.050**	% (w/w)	0.050	1		08/02/11 08:54		
Sulfur, HNO3 Extractable	**<0.050**	% (w/w)	0.050	1		08/02/11 08:54		
Sulfur, Hot Water Extractable	**<0.050**	% (w/w)	0.050	1		08/02/11 08:54		
Sulfur, Residual	**<0.050**	% (w/w)	0.050	1		08/02/11 08:54		
Total Sulfur	**<0.050**	% (w/w)	0.050	1		08/02/11 08:54		
Sobek Calculations	Analytical Method: Modified Sobek 3.2							
Acid/Base Potential	**0**	tons/1000		1		08/02/11 00:00		
Acid Potential	**<4.3**	tons/1000	4.3	1		08/02/11 00:00		
Lime Requirement	**<5.4**	tons/1000	5.4	1		08/02/11 00:00		
SMP Lime Requirement	**0**	tons/1000	0.0	1		08/02/11 00:00		
Sobek SMP Buffer pH	Analytical Method: Modified Sobek 3.2							
SMP Buffer pH	**7.3**	Std. Units	0.10	1		07/26/11 09:40		

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ANALYTICAL RESULTS

Project: Black Pine Mine
Pace Project No.: 10163633

Sample: BP-CMN-SS-06-06 **Lab ID: 10163633010** Collected: 07/14/11 11:15 Received: 07/14/11 21:00 Matrix: Solid

Results reported on a "dry-weight" basis

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
6020 MET ICPMS	Analytical Method: EPA 6020 Preparation Method: EPA 3050							
Antimony	**2.1**	mg/kg	0.48	20	08/01/11 15:37	08/03/11 17:21	7440-36-0	
Arsenic	**7.0**	mg/kg	0.48	20	08/01/11 15:37	08/03/11 17:21	7440-38-2	
Barium	**67.9**	mg/kg	0.29	20	08/01/11 15:37	08/03/11 17:21	7440-39-3	
Cadmium	**0.25**	mg/kg	0.077	20	08/01/11 15:37	08/03/11 17:21	7440-43-9	
Chromium	**5.9**	mg/kg	0.48	20	08/01/11 15:37	08/03/11 17:21	7440-47-3	
Copper	**8.8**	mg/kg	0.48	20	08/01/11 15:37	08/03/11 17:21	7440-50-8	
Iron	**6890**	mg/kg	48.4	20	08/01/11 15:37	08/03/11 17:21	7439-89-6	
Lead	**19.0**	mg/kg	0.097	20	08/01/11 15:37	08/03/11 17:21	7439-92-1	
Manganese	**342**	mg/kg	0.48	20	08/01/11 15:37	08/03/11 17:21	7439-96-5	
Nickel	**8.0**	mg/kg	0.48	20	08/01/11 15:37	08/03/11 17:21	7440-02-0	
Silver	**<0.48**	mg/kg	0.48	20	08/01/11 15:37	08/03/11 17:21	7440-22-4	
Zinc	**37.9**	mg/kg	4.8	20	08/01/11 15:37	08/03/11 17:21	7440-66-6	
7471 Mercury	Analytical Method: EPA 7471 Preparation Method: EPA 7471							
Mercury	**<0.020**	mg/kg	0.020	1	07/28/11 19:18	08/01/11 16:13	7439-97-6	
Dry Weight	Analytical Method: % Moisture							
Percent Moisture	**10.9**	%	0.10	1		07/22/11 00:00		

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ANALYTICAL RESULTS

Project: Black Pine Mine
Pace Project No.: 10163633

Sample: BP-CMN-RS-06-02 **Lab ID: 10163633011** Collected: 07/14/11 11:20 Received: 07/14/11 21:00 Matrix: Solid

Results reported on a "dry-weight" basis

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
6020 MET ICPMS	Analytical Method: EPA 6020 Preparation Method: EPA 3050							
Antimony	**765**	mg/kg	2.5	100	08/01/11 15:37	08/03/11 17:30	7440-36-0	M6
Arsenic	**515**	mg/kg	2.5	100	08/01/11 15:37	08/03/11 17:30	7440-38-2	M6
Barium	**168**	mg/kg	0.30	20	08/01/11 15:37	08/03/11 17:27	7440-39-3	M6
Cadmium	**14.9**	mg/kg	0.40	100	08/01/11 15:37	08/03/11 17:30	7440-43-9	M6
Chromium	**4.1**	mg/kg	2.5	100	08/01/11 15:37	08/03/11 17:30	7440-47-3	M6
Copper	**1690**	mg/kg	2.5	100	08/01/11 15:37	08/03/11 17:30	7440-50-8	M6
Iron	**14400**	mg/kg	248	100	08/01/11 15:37	08/03/11 17:30	7439-89-6	M6
Lead	**3820**	mg/kg	2.0	400	08/01/11 15:37	08/04/11 13:45	7439-92-1	M6
Manganese	**652**	mg/kg	2.5	100	08/01/11 15:37	08/03/11 17:30	7439-96-5	M6
Nickel	**3.9**	mg/kg	2.5	100	08/01/11 15:37	08/03/11 17:30	7440-02-0	M6
Silver	**87.6**	mg/kg	2.5	100	08/01/11 15:37	08/03/11 17:30	7440-22-4	M6
Zinc	**1150**	mg/kg	24.8	100	08/01/11 15:37	08/03/11 17:30	7440-66-6	M6
7471 Mercury	Analytical Method: EPA 7471 Preparation Method: EPA 7471							
Mercury	**0.26**	mg/kg	0.020	1	07/28/11 19:18	08/01/11 16:19	7439-97-6	
Dry Weight	Analytical Method: % Moisture							
Percent Moisture	**7.5**	%	0.10	1		07/22/11 00:00		
Sobek Acid Base Potential	Analytical Method: Modified Sobek 3.2							
Neutralization Potential	**11**	tons/1000	0.50	1		08/02/11 00:00		
Sobek Extractable Sulfur	Analytical Method: Modified Sobek 3.2							
Sulfur, HCl Extractable	**0.0778**	% (w/w)	0.050	1		08/02/11 09:06		
Sulfur, HNO3 Extractable	**0.144**	% (w/w)	0.050	1		08/02/11 09:06		
Sulfur, Hot Water Extractable	**0.169**	% (w/w)	0.050	1		08/02/11 09:06		
Sulfur, Residual	**<0.050**	% (w/w)	0.050	1		08/02/11 09:06		
Total Sulfur	**0.396**	% (w/w)	0.050	1		08/02/11 09:06		
Sobek Calculations	Analytical Method: Modified Sobek 3.2							
Acid/Base Potential	**4.2**	tons/1000		1		08/02/11 00:00		
Acid Potential	**6.5**	tons/1000	4.3	1		08/02/11 00:00		
Lime Requirement	**8.1**	tons/1000	5.4	1		08/02/11 00:00		
SMP Lime Requirement	**0**	tons/1000	0.0	1		08/02/11 00:00		
Sobek SMP Buffer pH	Analytical Method: Modified Sobek 3.2							
SMP Buffer pH	**7.4**	Std. Units	0.10	1		07/26/11 09:40		

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ANALYTICAL RESULTS

Project: Black Pine Mine
Pace Project No.: 10163633

Sample: BP-CMN-RS-06-00 **Lab ID: 10163633012** Collected: 07/14/11 11:25 Received: 07/14/11 21:00 Matrix: Solid

Results reported on a "dry-weight" basis

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
6020 MET ICPMS	Analytical Method: EPA 6020 Preparation Method: EPA 3050							
Antimony	**15.4**	mg/kg	0.44	20	08/01/11 15:37	08/03/11 17:34	7440-36-0	
Arsenic	**22.3**	mg/kg	8.7	400	08/01/11 15:37	08/03/11 17:37	7440-38-2	
Barium	**177**	mg/kg	0.26	20	08/01/11 15:37	08/03/11 17:34	7440-39-3	
Cadmium	**0.54**	mg/kg	0.070	20	08/01/11 15:37	08/03/11 17:34	7440-43-9	
Chromium	**4.1**	mg/kg	0.44	20	08/01/11 15:37	08/03/11 17:34	7440-47-3	
Copper	**57.5**	mg/kg	8.7	400	08/01/11 15:37	08/03/11 17:37	7440-50-8	
Iron	**6670**	mg/kg	43.7	20	08/01/11 15:37	08/03/11 17:34	7439-89-6	
Lead	**217**	mg/kg	0.087	20	08/01/11 15:37	08/03/11 17:34	7439-92-1	
Manganese	**910**	mg/kg	8.7	400	08/01/11 15:37	08/03/11 17:37	7439-96-5	
Nickel	**<8.7**	mg/kg	8.7	400	08/01/11 15:37	08/03/11 17:37	7440-02-0	
Silver	**1.6**	mg/kg	0.44	20	08/01/11 15:37	08/03/11 17:34	7440-22-4	
Zinc	**321**	mg/kg	87.5	400	08/01/11 15:37	08/03/11 17:37	7440-66-6	
7471 Mercury	Analytical Method: EPA 7471 Preparation Method: EPA 7471							
Mercury	**<0.022**	mg/kg	0.022	1	07/28/11 19:18	08/01/11 16:21	7439-97-6	
Dry Weight	Analytical Method: % Moisture							
Percent Moisture	**10.7**	%	0.10	1		07/22/11 00:00		
Sobek Acid Base Potential	Analytical Method: Modified Sobek 3.2							
Neutralization Potential	**0.94**	tons/1000	0.50	1		08/02/11 00:00		
Sobek Extractable Sulfur	Analytical Method: Modified Sobek 3.2							
Sulfur, HCl Extractable	**<0.050**	% (w/w)	0.050	1		08/02/11 09:20		
Sulfur, HNO3 Extractable	**<0.050**	% (w/w)	0.050	1		08/02/11 09:20		
Sulfur, Hot Water Extractable	**<0.050**	% (w/w)	0.050	1		08/02/11 09:20		
Sulfur, Residual	**<0.050**	% (w/w)	0.050	1		08/02/11 09:20		
Total Sulfur	**<0.050**	% (w/w)	0.050	1		08/02/11 09:20		
Sobek Calculations	Analytical Method: Modified Sobek 3.2							
Acid/Base Potential	**0.9**	tons/1000		1		08/02/11 00:00		
Acid Potential	**<4.3**	tons/1000	4.3	1		08/02/11 00:00		
Lime Requirement	**<5.4**	tons/1000	5.4	1		08/02/11 00:00		
SMP Lime Requirement	**0**	tons/1000	0.0	1		08/02/11 00:00		
Sobek SMP Buffer pH	Analytical Method: Modified Sobek 3.2							
SMP Buffer pH	**7.3**	Std. Units	0.10	1		07/26/11 09:40		

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QUALITY CONTROL DATA

Project: Black Pine Mine
Pace Project No.: 10163633

QC Batch: MPRP/27166 Analysis Method: EPA 6020
QC Batch Method: EPA 3050 Analysis Description: 6020 MET
Associated Lab Samples: 10163633001, 10163633002, 10163633003, 10163633004, 10163633005, 10163633006, 10163633007, 10163633008, 10163633009, 10163633010, 10163633011, 10163633012

METHOD BLANK: 1014848 Matrix: Solid
Associated Lab Samples: 10163633001, 10163633002, 10163633003, 10163633004, 10163633005, 10163633006, 10163633007, 10163633008, 10163633009, 10163633010, 10163633011, 10163633012

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Antimony	mg/kg	<0.50	0.50	08/03/11 15:51	
Arsenic	mg/kg	<0.50	0.50	08/03/11 15:51	
Barium	mg/kg	<0.30	0.30	08/03/11 15:51	
Cadmium	mg/kg	<0.080	0.080	08/03/11 15:51	
Chromium	mg/kg	<0.50	0.50	08/03/11 15:51	
Copper	mg/kg	<0.50	0.50	08/03/11 15:51	
Iron	mg/kg	<50.0	50.0	08/03/11 15:51	
Lead	mg/kg	<0.10	0.10	08/03/11 15:51	
Manganese	mg/kg	<0.50	0.50	08/03/11 15:51	
Nickel	mg/kg	<0.50	0.50	08/03/11 15:51	
Silver	mg/kg	<0.50	0.50	08/03/11 15:51	
Zinc	mg/kg	<5.0	5.0	08/03/11 15:51	

LABORATORY CONTROL SAMPLE: 1014849

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Antimony	mg/kg	19.6	22.5	115	75-125	
Arsenic	mg/kg	19.6	22.1	112	75-125	
Barium	mg/kg	19.6	22.6	115	75-125	
Cadmium	mg/kg	19.6	22.2	113	75-125	
Chromium	mg/kg	19.6	22.5	115	75-125	
Copper	mg/kg	19.6	23.8	121	75-125	
Iron	mg/kg	245	285	116	75-125	
Lead	mg/kg	19.6	22.5	115	75-125	
Manganese	mg/kg	19.6	23.3	119	75-125	
Nickel	mg/kg	19.6	24.2	123	75-125	
Silver	mg/kg	19.6	23.4	119	75-125	
Zinc	mg/kg	19.6	21.6	110	75-125	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 1014850 1014851

Parameter	Units	10163633001 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Antimony	mg/kg	1380	21.8	22	1430	1420	262	211	75-125	.7	20	M6
Arsenic	mg/kg	1380	21.8	22	1280	1150	-425	-1040	75-125	11	20	M6
Barium	mg/kg	247	21.8	22	281	258	157	49	75-125	9	20	M6
Cadmium	mg/kg	20.6	21.8	22	68.3	69.0	219	220	75-125	1	20	M6
Chromium	mg/kg	2.7	21.8	22	55.3	54.0	241	233	75-125	2	20	M6

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QUALITY CONTROL DATA

Project: Black Pine Mine
Pace Project No.: 10163633

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 1014850 1014851

Parameter	Units	10163633001 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Copper	mg/kg	1280	21.8	22	1160	1200	-545	-356	75-125	3	20	M6
Iron	mg/kg	23100	273	275	21700	20600	-513	-892	75-125	5	20	M6
Lead	mg/kg	6960	21.8	22	6940	7420	-79	2100	75-125	7	20	M6
Manganese	mg/kg	270	21.8	22	332	246	283	-111	75-125	30	20	D6,M6
Nickel	mg/kg	<2.8	21.8	22	50.8	51.5	225	226	75-125	1	20	M6
Silver	mg/kg	319	21.8	22	219	194	-462	-571	75-125	12	20	M6
Zinc	mg/kg	332	21.8	22	432	364	460	145	75-125	17	20	M6

MATRIX SPIKE SAMPLE: 1014852

Parameter	Units	10163633011 Result	Spike Conc.	MS Result	MS % Rec	% Rec Limits	Qualifiers
Antimony	mg/kg	765	19.8	907	714	75-125	M6
Arsenic	mg/kg	515	19.8	2180	8400	75-125	M6
Barium	mg/kg	168	19.8	214	232	75-125	M6
Cadmium	mg/kg	14.9	19.8	63.6	246	75-125	M6
Chromium	mg/kg	4.1	19.8	52.7	245	75-125	M6
Copper	mg/kg	1690	19.8	1970	1410	75-125	M6
Iron	mg/kg	14400	247	15900	623	75-125	M6
Lead	mg/kg	3820	19.8	7060	16400	75-125	M6
Manganese	mg/kg	652	19.8	586	-333	75-125	M6
Nickel	mg/kg	3.9	19.8	52.1	243	75-125	M6
Silver	mg/kg	87.6	19.8	266	899	75-125	M6
Zinc	mg/kg	1150	19.8	1220	402	75-125	M6

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QUALITY CONTROL DATA

Project: Black Pine Mine
Pace Project No.: 10163633

QC Batch: MERP/5649 Analysis Method: EPA 7471
QC Batch Method: EPA 7471 Analysis Description: 7471 Mercury
Associated Lab Samples: 10163633001, 10163633002, 10163633003, 10163633004, 10163633005, 10163633006, 10163633007, 10163633008, 10163633009, 10163633010, 10163633011, 10163633012

METHOD BLANK: 1016602 Matrix: Solid
Associated Lab Samples: 10163633001, 10163633002, 10163633003, 10163633004, 10163633005, 10163633006, 10163633007, 10163633008, 10163633009, 10163633010, 10163633011, 10163633012

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Mercury	mg/kg	<0.018	0.018	08/01/11 15:23	

LABORATORY CONTROL SAMPLE: 1016603

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Mercury	mg/kg	.45	0.47	104	80-120	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 1016604 1016605

Parameter	Units	10163633001 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Mercury	mg/kg	7.0	.46	.51	5.2	5.7	-399	-259	80-120	9	20	M6

MATRIX SPIKE SAMPLE: 1016606

Parameter	Units	10163634008 Result	Spike Conc.	MS Result	MS % Rec	% Rec Limits	Qualifiers
Mercury	mg/kg	<0.021	.56	<0.022	3	80-120	M1

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QUALITY CONTROL DATA

Project: Black Pine Mine
Pace Project No.: 10163633

QC Batch: MPRP/27268 Analysis Method: % Moisture
QC Batch Method: % Moisture Analysis Description: Dry Weight/Percent Moisture
Associated Lab Samples: 10163633001, 10163633002, 10163633003, 10163633004, 10163633005, 10163633006, 10163633007

SAMPLE DUPLICATE: 1018184

Parameter	Units	10163610023 Result	Dup Result	RPD	Max RPD	Qualifiers
Percent Moisture	%	5.9	6.5	10	30	

SAMPLE DUPLICATE: 1018185

Parameter	Units	10163633007 Result	Dup Result	RPD	Max RPD	Qualifiers
Percent Moisture	%	11.8	10.1	15	30	

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QUALITY CONTROL DATA

Project: Black Pine Mine
Pace Project No.: 10163633

QC Batch: MPRP/27274 Analysis Method: % Moisture
QC Batch Method: % Moisture Analysis Description: Dry Weight/Percent Moisture
Associated Lab Samples: 10163633008, 10163633009, 10163633010, 10163633011, 10163633012

SAMPLE DUPLICATE: 1018328

Parameter	Units	10163633008 Result	Dup Result	RPD	Max RPD	Qualifiers
Percent Moisture	%	7.9	6.8	15	30	

SAMPLE DUPLICATE: 1018347

Parameter	Units	10163990001 Result	Dup Result	RPD	Max RPD	Qualifiers
Percent Moisture	%	10.6	10.3	3	30	

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QUALITY CONTROL DATA

Project: Black Pine Mine
Pace Project No.: 10163633

QC Batch: MT/6496 Analysis Method: Modified Sobek 3.2
QC Batch Method: Modified Sobek 3.2 Analysis Description: Sobek Acid Base Potential
Associated Lab Samples: 10163633001, 10163633002, 10163633003, 10163633008, 10163633009, 10163633011, 10163633012

METHOD BLANK: 1020547 Matrix: Solid
Associated Lab Samples: 10163633001, 10163633002, 10163633003, 10163633008, 10163633009, 10163633011, 10163633012

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Neutralization Potential	tons/1000	<0.5	0.50	08/02/11 00:00	

SAMPLE DUPLICATE: 1020546

Parameter	Units	10163635003 Result	Dup Result	RPD	Max RPD	Qualifiers
Neutralization Potential	tons/1000	<0.5	0.97			

SAMPLE DUPLICATE: 1020548

Parameter	Units	10163633009 Result	Dup Result	RPD	Max RPD	Qualifiers
Neutralization Potential	tons/1000	<0.5	6.5			

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QUALITY CONTROL DATA

Project: Black Pine Mine
Pace Project No.: 10163633

QC Batch: MT/6487 Analysis Method: Modified Sobek 3.2
QC Batch Method: Modified Sobek 3.2 Analysis Description: Sobek Extractable Sulfur
Associated Lab Samples: 10163633001, 10163633002, 10163633003, 10163633008, 10163633009, 10163633011, 10163633012

METHOD BLANK: 1019970 Matrix: Solid
Associated Lab Samples: 10163633001, 10163633002, 10163633003, 10163633008, 10163633009, 10163633011, 10163633012

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Total Sulfur	% (w/w)	<0.050	0.050	08/01/11 13:07	

SAMPLE DUPLICATE: 1019972

Parameter	Units	10163635003 Result	Dup Result	RPD	Max RPD	Qualifiers
Total Sulfur	% (w/w)	<0.050	<0.050			

SAMPLE DUPLICATE: 1019973

Parameter	Units	10163633008 Result	Dup Result	RPD	Max RPD	Qualifiers
Total Sulfur	% (w/w)	0.369	0.428	15		

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QUALITY CONTROL DATA

Project: Black Pine Mine
Pace Project No.: 10163633

QC Batch: MT/6542 Analysis Method: Modified Sobek 3.2
QC Batch Method: Modified Sobek 3.2 Analysis Description: Sobek SMP Buffer pH
Associated Lab Samples: 10163633001, 10163633002, 10163633003, 10163633008, 10163633009, 10163633011, 10163633012

SAMPLE DUPLICATE: 1022810

Parameter	Units	10163635003 Result	Dup Result	RPD	Max RPD	Qualifiers
SMP Buffer pH	Std. Units	6.4	6.4	.3	20	

SAMPLE DUPLICATE: 1026467

Parameter	Units	10163633008 Result	Dup Result	RPD	Max RPD	Qualifiers
SMP Buffer pH	Std. Units	7.4	7.4	.1	20	

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QUALIFIERS

Project: Black Pine Mine
Pace Project No.: 10163633

DEFINITIONS

DF - Dilution Factor, if reported, represents the factor applied to the reported data due to changes in sample preparation, dilution of the sample aliquot, or moisture content.

ND - Not Detected at or above adjusted reporting limit.

J - Estimated concentration above the adjusted method detection limit and below the adjusted reporting limit.

MDL - Adjusted Method Detection Limit.

S - Surrogate

1,2-Diphenylhydrazine (8270 listed analyte) decomposes to Azobenzene.

Consistent with EPA guidelines, unrounded data are displayed and have been used to calculate % recovery and RPD values.

LCS(D) - Laboratory Control Sample (Duplicate)

MS(D) - Matrix Spike (Duplicate)

DUP - Sample Duplicate

RPD - Relative Percent Difference

NC - Not Calculable.

SG - Silica Gel - Clean-Up

U - Indicates the compound was analyzed for, but not detected.

N-Nitrosodiphenylamine decomposes and cannot be separated from Diphenylamine using Method 8270. The result reported for each analyte is a combined concentration.

LABORATORIES

PASI-M	Pace Analytical Services - Minneapolis
PASI-MT	Pace Analytical Services - Montana

ANALYTE QUALIFIERS

D6	The relative percent difference (RPD) between the sample and sample duplicate exceeded laboratory control limits.
M1	Matrix spike recovery exceeded QC limits. Batch accepted based on laboratory control sample (LCS) recovery.
M6	Matrix spike and Matrix spike duplicate recovery not evaluated against control limits due to sample dilution.

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QUALITY CONTROL DATA CROSS REFERENCE TABLE

Project: Black Pine Mine
Pace Project No.: 10163633

Lab ID	Sample ID	QC Batch Method	QC Batch	Analytical Method	Analytical Batch
10163633001	**BP-HM-RS-07-01**	EPA 3050	MPRP/27166	EPA 6020	ICPM/11156
10163633002	**BP-HM-RS-06-01**	EPA 3050	MPRP/27166	EPA 6020	ICPM/11156
10163633003	**BP-HM-RS-05-02**	EPA 3050	MPRP/27166	EPA 6020	ICPM/11156
10163633004	**BP-HM-RS-05-05**	EPA 3050	MPRP/27166	EPA 6020	ICPM/11156
10163633005	**BP-HM-SS-07-03**	EPA 3050	MPRP/27166	EPA 6020	ICPM/11156
10163633006	**BP-HM-RS-06-08**	EPA 3050	MPRP/27166	EPA 6020	ICPM/11156
10163633007	**BP-CMN-SS-05-08**	EPA 3050	MPRP/27166	EPA 6020	ICPM/11156
10163633008	**BP-CMN-RS-05-05**	EPA 3050	MPRP/27166	EPA 6020	ICPM/11156
10163633009	**BP-CMN-SS-05-00**	EPA 3050	MPRP/27166	EPA 6020	ICPM/11156
10163633010	**BP-CMN-SS-06-06**	EPA 3050	MPRP/27166	EPA 6020	ICPM/11156
10163633011	**BP-CMN-RS-06-02**	EPA 3050	MPRP/27166	EPA 6020	ICPM/11156
10163633012	**BP-CMN-RS-06-00**	EPA 3050	MPRP/27166	EPA 6020	ICPM/11156
10163633001	**BP-HM-RS-07-01**	EPA 7471	MERP/5649	EPA 7471	MERC/6495
10163633002	**BP-HM-RS-06-01**	EPA 7471	MERP/5649	EPA 7471	MERC/6495
10163633003	**BP-HM-RS-05-02**	EPA 7471	MERP/5649	EPA 7471	MERC/6495
10163633004	**BP-HM-RS-05-05**	EPA 7471	MERP/5649	EPA 7471	MERC/6495
10163633005	**BP-HM-SS-07-03**	EPA 7471	MERP/5649	EPA 7471	MERC/6495
10163633006	**BP-HM-RS-06-08**	EPA 7471	MERP/5649	EPA 7471	MERC/6495
10163633007	**BP-CMN-SS-05-08**	EPA 7471	MERP/5649	EPA 7471	MERC/6495
10163633008	**BP-CMN-RS-05-05**	EPA 7471	MERP/5649	EPA 7471	MERC/6495
10163633009	**BP-CMN-SS-05-00**	EPA 7471	MERP/5649	EPA 7471	MERC/6495
10163633010	**BP-CMN-SS-06-06**	EPA 7471	MERP/5649	EPA 7471	MERC/6495
10163633011	**BP-CMN-RS-06-02**	EPA 7471	MERP/5649	EPA 7471	MERC/6495
10163633012	**BP-CMN-RS-06-00**	EPA 7471	MERP/5649	EPA 7471	MERC/6495
10163633001	**BP-HM-RS-07-01**	% Moisture	MPRP/27268		
10163633002	**BP-HM-RS-06-01**	% Moisture	MPRP/27268		
10163633003	**BP-HM-RS-05-02**	% Moisture	MPRP/27268		
10163633004	**BP-HM-RS-05-05**	% Moisture	MPRP/27268		
10163633005	**BP-HM-SS-07-03**	% Moisture	MPRP/27268		
10163633006	**BP-HM-RS-06-08**	% Moisture	MPRP/27268		
10163633007	**BP-CMN-SS-05-08**	% Moisture	MPRP/27268		
10163633008	**BP-CMN-RS-05-05**	% Moisture	MPRP/27274		
10163633009	**BP-CMN-SS-05-00**	% Moisture	MPRP/27274		
10163633010	**BP-CMN-SS-06-06**	% Moisture	MPRP/27274		
10163633011	**BP-CMN-RS-06-02**	% Moisture	MPRP/27274		
10163633012	**BP-CMN-RS-06-00**	% Moisture	MPRP/27274		
10163633001	**BP-HM-RS-07-01**	Modified Sobek 3.2	MT/6496		
10163633002	**BP-HM-RS-06-01**	Modified Sobek 3.2	MT/6496		
10163633003	**BP-HM-RS-05-02**	Modified Sobek 3.2	MT/6496		
10163633008	**BP-CMN-RS-05-05**	Modified Sobek 3.2	MT/6496		
10163633009	**BP-CMN-SS-05-00**	Modified Sobek 3.2	MT/6496		
10163633011	**BP-CMN-RS-06-02**	Modified Sobek 3.2	MT/6496		
10163633012	**BP-CMN-RS-06-00**	Modified Sobek 3.2	MT/6496		
10163633001	**BP-HM-RS-07-01**	Modified Sobek 3.2	MT/6487		
10163633002	**BP-HM-RS-06-01**	Modified Sobek 3.2	MT/6487		
10163633003	**BP-HM-RS-05-02**	Modified Sobek 3.2	MT/6487		

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QUALITY CONTROL DATA CROSS REFERENCE TABLE

Project: Black Pine Mine
Pace Project No.: 10163633

Lab ID	Sample ID	QC Batch Method	QC Batch	Analytical Method	Analytical Batch
10163633008	**BP-CMN-RS-05-05**	Modified Sobek 3.2	MT/6487		
10163633009	**BP-CMN-SS-05-00**	Modified Sobek 3.2	MT/6487		
10163633011	**BP-CMN-RS-06-02**	Modified Sobek 3.2	MT/6487		
10163633012	**BP-CMN-RS-06-00**	Modified Sobek 3.2	MT/6487		
10163633001	**BP-HM-RS-07-01**	Modified Sobek 3.2	MT/6500		
10163633002	**BP-HM-RS-06-01**	Modified Sobek 3.2	MT/6500		
10163633003	**BP-HM-RS-05-02**	Modified Sobek 3.2	MT/6500		
10163633008	**BP-CMN-RS-05-05**	Modified Sobek 3.2	MT/6500		
10163633009	**BP-CMN-SS-05-00**	Modified Sobek 3.2	MT/6500		
10163633011	**BP-CMN-RS-06-02**	Modified Sobek 3.2	MT/6500		
10163633012	**BP-CMN-RS-06-00**	Modified Sobek 3.2	MT/6500		
10163633001	**BP-HM-RS-07-01**	Modified Sobek 3.2	MT/6542		
10163633002	**BP-HM-RS-06-01**	Modified Sobek 3.2	MT/6542		
10163633003	**BP-HM-RS-05-02**	Modified Sobek 3.2	MT/6542		
10163633008	**BP-CMN-RS-05-05**	Modified Sobek 3.2	MT/6542		
10163633009	**BP-CMN-SS-05-00**	Modified Sobek 3.2	MT/6542		
10163633011	**BP-CMN-RS-06-02**	Modified Sobek 3.2	MT/6542		
10163633012	**BP-CMN-RS-06-00**	Modified Sobek 3.2	MT/6542		

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CHAIN-OF-CUSTODY / Analytical Request Document

The Chain-of-Custody is a LEGAL DOCUMENT. All relevant fields must be completed accurately.

Page: 1 of 1

1429989

Section A Required Client Information:

Company: HERRERA
Address:
Email To: KHOUCK@HERRERAINC.COM
Phone: Fax:
Requested Due Date/TAT:

Section B Required Project Information:

Report To: KEVIN HOUCK
Copy To:
Purchase Order No.:
Project Name: BLACK PINE MINE
Project Number:

Section C Invoice Information:

Attention:
Company Name: DEQ
Address:
Pace Quote Reference:
Pace Project Manager:
Pace Profile #:

REGULATORY AGENCY

☐ NPDES ☐ GROUND WATER ☐ DRINKING WATER
☐ UST ☐ RCRA ☐ OTHER

Site Location STATE:

Requested Analysis Filtered (Y/N)

Section D Required Client Information

SAMPLE ID
(A-Z, 0-9 / ,-)
Sample IDs MUST BE UNIQUE

Matrix Codes (MATRIX / CODE)
Drinking Water DW
Water WT
Waste Water WW
Product P
Soil/Solid SL
Oil OL
Wipe WP
Air AR
Tissue TS
Other OT

ITEM #	SAMPLE ID	MATRIX CODE (see valid codes to left)	SAMPLE TYPE (G=GRAB C=COMP)	COLLECTED COMPOSITE START DATE	COMPOSITE START TIME	COMPOSITE END/GRAB DATE	COMPOSITE END/GRAB TIME	SAMPLE TEMP AT COLLECTION	# OF CONTAINERS	Preservatives: Unpreserved	H_2SO_4	HNO_3	HCl	NaOH	$Na_2S_2O_3$	Methanol	Other	Analysis Test Y/N	TOTAL REC. METALS	ABA	MERCURY ANALYSIS	MOISTURE CONTENT	Residual Chlorine (Y/N)	TOTAL RECOVERABLE METALS = SB, AS, BA, CD, CR, CO, FE, PB, MN, HG, NI, ZN 10163633 Pace Project No./ Lab I.D.
1	BP-HM-RS-07-01	SL	C			7/13/11	1520		2	X									X	X				001
2	BP-HM-RS-06-01	SL	C			7/13/11	1550		2	X									X	X				002
3	BP-HM-RS-05-02	SL	C			7/13/11	1620		2	X									X	X				003
4	BP-HM-RS-05-05	SL	G			7/13/11	1615		1	X									X					004
5	BP-HM-SS-07-03	SL	G			7/13/11	1527		1	X									X					005
6	BP-HM-RS-06-02	SL	G			7/13/11	1610		1	X									X					006
7	BP-CMN-SS-05-08	SL	G			7/14/11	1000		1	X									X					007
8	BP-CMN-RS-05-05	SL	G			7/14/11	1005		2	X									X	X		X		008
9	BP-CMN-SS-05-00	SL	G			7/14/11	1010		2	X									X	X		X		009
10	BP-CMN-SS-06-06	SL	G			7/14/11	1115		1	X									X					010
11	BP-CMN-RS-06-02	SL	C			7/14/11	1120		2	X									X	X		X		011
12	BP-CMN-SS-06-00	SL	C			7/14/11	1125		2	X									X	X		X		012

ADDITIONAL COMMENTS	RELINQUISHED BY / AFFILIATION	DATE	TIME	ACCEPTED BY / AFFILIATION	DATE	TIME	SAMPLE CONDITIONS
	W.D Acton/Herrera	7/14/11	1540		7/14/11	3:44	
		7/14/11	9:00	Nonna C. Hamblet/Pace	7/14/11	2100	
							3.6 / Y / N / Y

Temp in °C | Received on Ice (Y/N) | Custody Sealed Cooler (Y/N) | Samples Intact (Y/N)

ORIGINAL

SAMPLER NAME AND SIGNATURE
PRINT Name of SAMPLER:
SIGNATURE of SAMPLER: DATE Signed (MM/DD/YY):

*Important Note: By signing this form you are accepting Pace's NET 30 day payment terms and agreeing to late charges of 1.5% per month for any invoices not paid within 30 days.

F-ALL-Q-020rev.07, 15-May-2007

Sample Condition Upon Receipt

Pace Analytical

Client Name: MDEQ BPM Project # 10163633

Courier: ☐ Fed Ex ☐ UPS ☐ USPS ☐ Client ☐ Commercial ☒ Pace Other _____

Tracking #: Blaine drop off

Custody Seal on Cooler/Box Present: ☐ yes ☒ no Seals intact: ☐ yes ☒ no

Packing Material: ☐ Bubble Wrap ☒ Bubble Bags ☐ None ☐ Other _____ Temp Blank: Yes _____ No X

Thermometer Used 1383045 or 135 Type of Ice: (Wet) Blue None ☒ Samples on ice, cooling process has begun

Cooler Temperature 3.1o Biological Tissue is Frozen: Yes No

Temp should be above freezing to 6°C

Date and Initials of person examining contents: KW 7/16/14

		Comments:
Chain of Custody Present:	☒Yes ☐No ☐N/A	1.
Chain of Custody Filled Out:	☒Yes ☐No ☐N/A	2.
Chain of Custody Relinquished:	☒Yes ☐No ☐N/A	3.
Sampler Name & Signature on COC:	☐Yes ☒No ☐N/A	4.
Samples Arrived within Hold Time:	☒Yes ☐No ☐N/A	5.
Short Hold Time Analysis (<72hr):	☐Yes ☒No ☐N/A	6.
Rush Turn Around Time Requested:	☐Yes ☒No ☐N/A	7.
Sufficient Volume:	☒Yes ☐No ☐N/A	8.
Correct Containers Used:	☒Yes ☐No ☐N/A	9. PB
-Pace Containers Used:	☒Yes ☐No ☐N/A	
Containers Intact:	☒Yes ☐No ☐N/A	10.
Filtered volume received for Dissolved tests	☐Yes ☐No ☒N/A	11.
Sample Labels match COC:	☒Yes ☐No ☐N/A	12.
-Includes date/time/ID/Analysis Matrix: SL		
All containers needing acid/base preservation have been checked. Noncompliance are noted in 13.	☐Yes ☐No ☒N/A	13. ☐ HNO3 ☐ H2SO4 ☐ NaOH ☐ HCl Samp #
All containers needing preservation are found to be in compliance with EPA recommendation.	☐Yes ☐No ☒N/A	
Exceptions: VOA,Coliform, TOC, Oil and Grease, WI-DRO (water)	☐Yes ☒No	Initial when completed / Lot # of added preservative
Samples checked for dechlorination:	☐Yes ☐No ☒N/A	14.
Headspace in VOA Vials (>6mm):	☐Yes ☐No ☒N/A	15.
Trip Blank Present:	☐Yes ☒No ☐N/A	16.
Trip Blank Custody Seals Present	☐Yes ☐No ☒N/A	
Pace Trip Blank Lot # (if purchased): N/A		

Client Notification/ Resolution: Field Data Required? Y / N

Person Contacted: _____ Date/Time: _____

Comments/ Resolution: _____

Project Manager Review: _____ **Date:** 7/16/14

Note: Whenever there is a discrepancy affecting North Carolina compliance samples, a copy of this form will be sent to the North Carolina DEHNR Certification Office (i.e out of hold, incorrect preservative, out of temp, incorrect containers)

Pace Analytical Services, Inc.
602 S 25th Street
Billings, MT 591014549
(406)254-7226

August 11, 2011

Kevin Houck
Herrera Environmental Consultants
101 East Broadway, Suite 610
Missoula, MT 59802

RE: Project: Black Pine Mine
Pace Project No.: 10163634

Dear Kevin Houck:
Enclosed are the analytical results for sample(s) received by the laboratory on July 16, 2011. The results relate only to the samples included in this report.

If you have any questions concerning this report, please feel free to contact me.

Sincerely,

Sally Heinje

sally.heinje@pacelabs.com
Project Manager

Enclosures

cc: Devin Clary, Montana Dept. of Environmental Quality
Mark Donner, Trihydro

REPORT OF LABORATORY ANALYSIS

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CERTIFICATIONS

Project: Black Pine Mine
Pace Project No.: 10163634

Minnesota Certification IDs

1700 Elm Street SE Suite 200, Minneapolis, MN 55414
A2LA Certification #: 2926.01
Alaska Certification #: UST-078
Alaska Certification #MN00064
Arizona Certification #: AZ-0014
Arkansas Certification #: 88-0680
California Certification #: 01155CA
EPA Region 8 Certification #: Pace
Florida/NELAP Certification #: E87605
Georgia Certification #: 959
Idaho Certification #: MN00064
Illinois Certification #: 200011
Iowa Certification #: 368
Kansas Certification #: E-10167
Louisiana Certification #: 03086
Louisiana Certification #: LA080009
Maine Certification #: 2007029
Maryland Certification #: 322
Michigan DEQ Certification #: 9909
Minnesota Certification #: 027-053-137
Mississippi Certification #: Pace
Montana Certification #: MT CERT0092
Nevada Certification #: MN_00064
Nebraska Certification #: Pace
New Jersey Certification #: MN-002
New Mexico Certification #: Pace
New York Certification #: 11647
North Carolina Certification #: 530
North Dakota Certification #: R-036
North Dakota Certification #: R-036A
Ohio VAP Certification #: CL101
Oklahoma Certification #: D9921
Oklahoma Certification #: 9507
Oregon Certification #: MN200001
Pennsylvania Certification #: 68-00563
Puerto Rico Certification
Tennessee Certification #: 02818
Texas Certification #: T104704192
Washington Certification #: C754
Wisconsin Certification #: 999407970

Montana Certification IDs

602 South 25th Street, Billings, MT 59101
EPA Region 8 Certification #: 8TMS-Q
Idaho Certification #: MT00012
Montana Certification #: MT CERT0040
NVLAP Certification #: 101292-0
Minnesota Dept of Health Certification #: 030-999-442

Kansas Certification IDs

9608 Loiret Boulevard, Lenexa, KS 66219
A2LA Certification #: 2456.01
Arkansas Certification #: 05-008-0
Illinois Certification #: 001191
Iowa Certification #: 118
Kansas/NELAP Certification #: E-10116
Louisiana Certification #: 03055
Nevada Certification #: KS000212008A
Oklahoma Certification #: 9205/9935
Texas Certification #: T104704407-08-TX
Utah Certification #: 9135995665

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SAMPLE SUMMARY

Project: Black Pine Mine
Pace Project No.: 10163634

Lab ID	Sample ID	Matrix	Date Collected	Date Received
10163634001	**BP-CMN-SS-04-00**	Solid	07/14/11 12:45	07/16/11 20:03
10163634002	**BP-CMN-RS-04-02**	Solid	07/14/11 12:35	07/16/11 20:03
10163634003	**BP-CMN-RS-04-05**	Solid	07/14/11 12:40	07/16/11 20:03
10163634004	**BP-CMN-SS-04-08**	Solid	07/14/11 12:30	07/16/11 20:03
10163634005	**BP-CMN-SS-07-00**	Solid	07/14/11 12:35	07/16/11 20:03
10163634006	**BP-CMN-SS-07-06**	Solid	07/14/11 13:40	07/16/11 20:03
10163634007	**BP-CMN-SS-08-00**	Solid	07/14/11 14:05	07/16/11 20:03
10163634008	**BP-CMN-SS-08-03**	Solid	07/14/11 14:10	07/16/11 20:03
10163634009	**BP-CMN-SS-09-00**	Solid	07/14/11 14:30	07/16/11 20:03
10163634010	**BP-CMN-SS-09-04**	Solid	07/14/11 14:45	07/16/11 20:03

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SAMPLE ANALYTE COUNT

Project: Black Pine Mine
Pace Project No.: 10163634

Lab ID	Sample ID	Method	Analysts	Analytes Reported	Laboratory
10163634001	**BP-CMN-SS-04-00**	EPA 6020	RJS	12	PASI-M
		EPA 7471	TEM	1	PASI-M
		% Moisture	JDL	1	PASI-M
		Modified Sobek 3.2	JH1	1	PASI-MT
		Modified Sobek 3.2	JH1	5	PASI-MT
		Modified Sobek 3.2	JH1	4	PASI-MT
		Modified Sobek 3.2	JH1	1	PASI-MT
10163634002	**BP-CMN-RS-04-02**	EPA 6020	RJS	12	PASI-M
		EPA 7471	TEM	1	PASI-M
		% Moisture	JDL	1	PASI-M
		Modified Sobek 3.2	JH1	1	PASI-MT
		Modified Sobek 3.2	JH1	5	PASI-MT
		Modified Sobek 3.2	JH1	4	PASI-MT
		Modified Sobek 3.2	JH1	1	PASI-MT
10163634003	**BP-CMN-RS-04-05**	EPA 6020	RJS	12	PASI-M
		EPA 7471	TEM	1	PASI-M
		% Moisture	JDL	1	PASI-M
		Modified Sobek 3.2	JH1	1	PASI-MT
		Modified Sobek 3.2	JH1	5	PASI-MT
		Modified Sobek 3.2	JH1	4	PASI-MT
		Modified Sobek 3.2	JH1	1	PASI-MT
10163634004	**BP-CMN-SS-04-08**	EPA 6020	RJS	12	PASI-M
		EPA 7471	TEM	1	PASI-M
		% Moisture	JDL	1	PASI-M
10163634005	**BP-CMN-SS-07-00**	EPA 6020	RJS	12	PASI-M
		EPA 7471	TEM	1	PASI-M
		% Moisture	JDL	1	PASI-M
		Modified Sobek 3.2	JH1	1	PASI-MT
		Modified Sobek 3.2	JH1	5	PASI-MT
		Modified Sobek 3.2	JH1	4	PASI-MT
		Modified Sobek 3.2	JH1	1	PASI-MT
10163634006	**BP-CMN-SS-07-06**	CLPICPAES	IP	1	PASI-M
		EPA 9081	SMW	1	PASI-K
		EPA 6020	RJS	12	PASI-M
		EPA 7471	TEM	1	PASI-M
		% Moisture	JDL	1	PASI-M
		ASA 33-3.2/EPA 353.2	CAC	1	PASI-MT

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SAMPLE ANALYTE COUNT

Project: Black Pine Mine
Pace Project No.: 10163634

Lab ID	Sample ID	Method	Analysts	Analytes Reported	Laboratory
		ASTM D421	CAC	1	PASI-MT
		ASA 29-3.5.2	CAC	1	PASI-MT
		ASA 10-3.2	CAC	1	PASI-MT
		ASA 24-5.4/SM4500	SA1	1	PASI-MT
		Modified Sobek 3.2	JH1	1	PASI-MT
		Modified Sobek 3.2	JH1	5	PASI-MT
		Modified Sobek 3.2	JH1	4	PASI-MT
		Modified Sobek 3.2	JH1	1	PASI-MT
10163634007	**BP-CMN-SS-08-00**	EPA 6020	RJS	12	PASI-M
		EPA 7471	TEM	1	PASI-M
		% Moisture	JDL	1	PASI-M
		Modified Sobek 3.2	JH1	1	PASI-MT
		Modified Sobek 3.2	JH1	5	PASI-MT
		Modified Sobek 3.2	JH1	4	PASI-MT
		Modified Sobek 3.2	JH1	1	PASI-MT
10163634008	**BP-CMN-SS-08-03**	CLPICPAES	IP	1	PASI-M
		EPA 9081	SMW	1	PASI-K
		EPA 6020	RJS	12	PASI-M
		EPA 7471	TEM	1	PASI-M
		% Moisture	JDL	1	PASI-M
		ASA 33-3.2/EPA 353.2	CAC	1	PASI-MT
		ASTM D421	CAC	1	PASI-MT
		ASA 29-3.5.2	CAC	1	PASI-MT
		ASA 10-3.2	CAC	1	PASI-MT
		ASA 24-5.4/SM4500	SA1	1	PASI-MT
		Modified Sobek 3.2	JH1	1	PASI-MT
		Modified Sobek 3.2	JH1	5	PASI-MT
		Modified Sobek 3.2	JH1	4	PASI-MT
		Modified Sobek 3.2	JH1	1	PASI-MT
		ASA 10-3.3	SR1	1	PASI-MT
10163634009	**BP-CMN-SS-09-00**	EPA 6020	RJS	12	PASI-M
		EPA 7471	TEM	1	PASI-M
		% Moisture	JDL	1	PASI-M
		Modified Sobek 3.2	JH1	1	PASI-MT
		Modified Sobek 3.2	JH1	5	PASI-MT
		Modified Sobek 3.2	JH1	4	PASI-MT
		Modified Sobek 3.2	JH1	1	PASI-MT

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SAMPLE ANALYTE COUNT

Project: Black Pine Mine
Pace Project No.: 10163634

Lab ID	Sample ID	Method	Analysts	Analytes Reported	Laboratory
10163634010	**BP-CMN-SS-09-04**	CLPICPAES	IP	1	PASI-M
		EPA 9081	SMW	1	PASI-K
		EPA 6020	RJS	12	PASI-M
		EPA 7471	TEM	1	PASI-M
		% Moisture	JDL	1	PASI-M
		ASA 33-3.2/EPA 353.2	CAC	1	PASI-MT
		ASTM D421	CAC	1	PASI-MT
		ASA 29-3.5.2	CAC	1	PASI-MT
		ASA 10-3.2	CAC	1	PASI-MT
		ASA 24-5.4/SM4500	SA1	1	PASI-MT
		Modified Sobek 3.2	JH1	1	PASI-MT
		Modified Sobek 3.2	JH1	5	PASI-MT
		Modified Sobek 3.2	JH1	4	PASI-MT
		Modified Sobek 3.2	JH1	1	PASI-MT
		ASA 10-3.3	SR1	1	PASI-MT

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PROJECT NARRATIVE

Project: Black Pine Mine
Pace Project No.: 10163634

Method: **CLPICPAES**
Description: 6010 MET ICP, MDEQ Potassium
Client: Montana Dept. of Environmental Quality
Date: August 11, 2011

General Information:
3 samples were analyzed for CLPICPAES. All samples were received in acceptable condition with any exceptions noted below.

Hold Time:
The samples were analyzed within the method required hold times with any exceptions noted below.

Sample Preparation:
The samples were prepared in accordance with ASA 13-3.5.2.2 with any exceptions noted below.

Initial Calibrations (including MS Tune as applicable):
All criteria were within method requirements with any exceptions noted below.

Continuing Calibration:
All criteria were within method requirements with any exceptions noted below.

Method Blank:
All analytes were below the report limit in the method blank with any exceptions noted below.

Laboratory Control Spike:
All laboratory control spike compounds were within QC limits with any exceptions noted below.

Matrix Spikes:
All percent recoveries and relative percent differences (RPDs) were within acceptance criteria with any exceptions noted below.

Duplicate Sample:
All duplicate sample results were within method acceptance criteria with any exceptions noted below.

Additional Comments:

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PROJECT NARRATIVE

Project: Black Pine Mine
Pace Project No.: 10163634

Method: **EPA 9081**
Description: Cation Exchange Capacity
Client: Montana Dept. of Environmental Quality
Date: August 11, 2011

General Information:
3 samples were analyzed for EPA 9081. All samples were received in acceptable condition with any exceptions noted below.

Hold Time:
The samples were analyzed within the method required hold times with any exceptions noted below.

Initial Calibrations (including MS Tune as applicable):
All criteria were within method requirements with any exceptions noted below.

Continuing Calibration:
All criteria were within method requirements with any exceptions noted below.

Method Blank:
All analytes were below the report limit in the method blank with any exceptions noted below.

Laboratory Control Spike:
All laboratory control spike compounds were within QC limits with any exceptions noted below.

Matrix Spikes:
All percent recoveries and relative percent differences (RPDs) were within acceptance criteria with any exceptions noted below.

Duplicate Sample:
All duplicate sample results were within method acceptance criteria with any exceptions noted below.

Additional Comments:

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PROJECT NARRATIVE

Project: Black Pine Mine
Pace Project No.: 10163634

Method: **EPA 6020**
Description: 6020 MET ICPMS
Client: Montana Dept. of Environmental Quality
Date: August 11, 2011

General Information:
10 samples were analyzed for EPA 6020. All samples were received in acceptable condition with any exceptions noted below.

Hold Time:
The samples were analyzed within the method required hold times with any exceptions noted below.

Sample Preparation:
The samples were prepared in accordance with EPA 3050 with any exceptions noted below.

Initial Calibrations (including MS Tune as applicable):
All criteria were within method requirements with any exceptions noted below.

Continuing Calibration:
All criteria were within method requirements with any exceptions noted below.

Internal Standards:
All internal standards were within QC limits with any exceptions noted below.

Method Blank:
All analytes were below the report limit in the method blank with any exceptions noted below.

Laboratory Control Spike:
All laboratory control spike compounds were within QC limits with any exceptions noted below.

Matrix Spikes:
All percent recoveries and relative percent differences (RPDs) were within acceptance criteria with any exceptions noted below.

QC Batch: MPRP/27167

A matrix spike and matrix spike duplicate (MS/MSD) were performed on the following sample(s): 10163483007,10163634007

M6: Matrix spike and Matrix spike duplicate recovery not evaluated against control limits due to sample dilution.

- MS (Lab ID: 1014855)
  - Antimony
  - Arsenic
  - Barium
  - Cadmium
  - Chromium
  - Copper
  - Iron
  - Lead
  - Manganese
  - Nickel
  - Zinc
- MS (Lab ID: 1014857)
  - Antimony

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PROJECT NARRATIVE

Project: Black Pine Mine
Pace Project No.: 10163634

Method: **EPA 6020**
Description: 6020 MET ICPMS
Client: Montana Dept. of Environmental Quality
Date: August 11, 2011

QC Batch: MPRP/27167

A matrix spike and matrix spike duplicate (MS/MSD) were performed on the following sample(s): 10163483007,10163634007

M6: Matrix spike and Matrix spike duplicate recovery not evaluated against control limits due to sample dilution.

- Arsenic
- Barium
- Cadmium
- Chromium
- Copper
- Iron
- Lead
- Manganese
- Nickel
- Silver
- Zinc

- MSD (Lab ID: 1014856)
  - Antimony
  - Arsenic
  - Barium
  - Cadmium
  - Chromium
  - Copper
  - Iron
  - Lead
  - Manganese
  - Nickel
  - Zinc

Duplicate Sample:
All duplicate sample results were within method acceptance criteria with any exceptions noted below.

Additional Comments:

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PROJECT NARRATIVE

Project: Black Pine Mine
Pace Project No.: 10163634

Method: **EPA 7471**
Description: 7471 Mercury
Client: Montana Dept. of Environmental Quality
Date: August 11, 2011

General Information:
10 samples were analyzed for EPA 7471. All samples were received in acceptable condition with any exceptions noted below.

Hold Time:
The samples were analyzed within the method required hold times with any exceptions noted below.

Sample Preparation:
The samples were prepared in accordance with EPA 7471 with any exceptions noted below.

Initial Calibrations (including MS Tune as applicable):
All criteria were within method requirements with any exceptions noted below.

Continuing Calibration:
All criteria were within method requirements with any exceptions noted below.

Method Blank:
All analytes were below the report limit in the method blank with any exceptions noted below.

Laboratory Control Spike:
All laboratory control spike compounds were within QC limits with any exceptions noted below.

Matrix Spikes:
All percent recoveries and relative percent differences (RPDs) were within acceptance criteria with any exceptions noted below.

QC Batch: MERP/5650

A matrix spike and matrix spike duplicate (MS/MSD) were performed on the following sample(s): 10163634009,10163643009

M1: Matrix spike recovery exceeded QC limits. Batch accepted based on laboratory control sample (LCS) recovery.

- MS (Lab ID: 1016609)
  - Mercury
- MSD (Lab ID: 1016610)
  - Mercury

M6: Matrix spike and Matrix spike duplicate recovery not evaluated against control limits due to sample dilution.

- MS (Lab ID: 1016611)
  - Mercury

QC Batch: MERP/5649

A matrix spike and matrix spike duplicate (MS/MSD) were performed on the following sample(s): 10163633001,10163634008

M1: Matrix spike recovery exceeded QC limits. Batch accepted based on laboratory control sample (LCS) recovery.

- MS (Lab ID: 1016606)
  - Mercury

M6: Matrix spike and Matrix spike duplicate recovery not evaluated against control limits due to sample dilution.

- MS (Lab ID: 1016604)
  - Mercury

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PROJECT NARRATIVE

Project: Black Pine Mine
Pace Project No.: 10163634

Method: **EPA 7471**
Description: 7471 Mercury
Client: Montana Dept. of Environmental Quality
Date: August 11, 2011

QC Batch: MERP/5649

A matrix spike and matrix spike duplicate (MS/MSD) were performed on the following sample(s): 10163633001,10163634008

M6: Matrix spike and Matrix spike duplicate recovery not evaluated against control limits due to sample dilution.

- MSD (Lab ID: 1016605)
  - Mercury

Duplicate Sample:
All duplicate sample results were within method acceptance criteria with any exceptions noted below.

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PROJECT NARRATIVE

Project: Black Pine Mine
Pace Project No.: 10163634

Method: **ASA 33-3.2/EPA 353.2**
Description: 353.2 Nitrate + Nitrite pres.
Client: Montana Dept. of Environmental Quality
Date: August 11, 2011

General Information:
3 samples were analyzed for ASA 33-3.2/EPA 353.2. All samples were received in acceptable condition with any exceptions noted below.

Hold Time:
The samples were analyzed within the method required hold times with any exceptions noted below.

Initial Calibrations (including MS Tune as applicable):
All criteria were within method requirements with any exceptions noted below.

Continuing Calibration:
All criteria were within method requirements with any exceptions noted below.

Internal Standards:
All internal standards were within QC limits with any exceptions noted below.

Surrogates:
All surrogates were within QC limits with any exceptions noted below.

Method Blank:
All analytes were below the report limit in the method blank with any exceptions noted below.

Laboratory Control Spike:
All laboratory control spike compounds were within QC limits with any exceptions noted below.

Matrix Spikes:
All percent recoveries and relative percent differences (RPDs) were within acceptance criteria with any exceptions noted below.

Duplicate Sample:
All duplicate sample results were within method acceptance criteria with any exceptions noted below.

Additional Comments:

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PROJECT NARRATIVE

Project: Black Pine Mine
Pace Project No.: 10163634

Method: **ASTM D421**
Description: Coarse
Client: Montana Dept. of Environmental Quality
Date: August 11, 2011

General Information:
3 samples were analyzed for ASTM D421. All samples were received in acceptable condition with any exceptions noted below.

Hold Time:
The samples were analyzed within the method required hold times with any exceptions noted below.

Initial Calibrations (including MS Tune as applicable):
All criteria were within method requirements with any exceptions noted below.

Continuing Calibration:
All criteria were within method requirements with any exceptions noted below.

Internal Standards:
All internal standards were within QC limits with any exceptions noted below.

Surrogates:
All surrogates were within QC limits with any exceptions noted below.

Method Blank:
All analytes were below the report limit in the method blank with any exceptions noted below.

Laboratory Control Spike:
All laboratory control spike compounds were within QC limits with any exceptions noted below.

Matrix Spikes:
All percent recoveries and relative percent differences (RPDs) were within acceptance criteria with any exceptions noted below.

Duplicate Sample:
All duplicate sample results were within method acceptance criteria with any exceptions noted below.

Additional Comments:

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PROJECT NARRATIVE

Project: Black Pine Mine
Pace Project No.: 10163634

Method: **ASA 29-3.5.2**
Description: Organic Matter MT ASA 29
Client: Montana Dept. of Environmental Quality
Date: August 11, 2011

General Information:
3 samples were analyzed for ASA 29-3.5.2. All samples were received in acceptable condition with any exceptions noted below.

Hold Time:
The samples were analyzed within the method required hold times with any exceptions noted below.

Initial Calibrations (including MS Tune as applicable):
All criteria were within method requirements with any exceptions noted below.

Continuing Calibration:
All criteria were within method requirements with any exceptions noted below.

Internal Standards:
All internal standards were within QC limits with any exceptions noted below.

Surrogates:
All surrogates were within QC limits with any exceptions noted below.

Method Blank:
All analytes were below the report limit in the method blank with any exceptions noted below.

Laboratory Control Spike:
All laboratory control spike compounds were within QC limits with any exceptions noted below.

Matrix Spikes:
All percent recoveries and relative percent differences (RPDs) were within acceptance criteria with any exceptions noted below.

Duplicate Sample:
All duplicate sample results were within method acceptance criteria with any exceptions noted below.

Additional Comments:

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PROJECT NARRATIVE

Project: Black Pine Mine
Pace Project No.: 10163634

Method: **ASA 10-3.2**
Description: ASA 10-3.2 pH
Client: Montana Dept. of Environmental Quality
Date: August 11, 2011

General Information:
3 samples were analyzed for ASA 10-3.2. All samples were received in acceptable condition with any exceptions noted below.

Hold Time:
The samples were analyzed within the method required hold times with any exceptions noted below.

Initial Calibrations (including MS Tune as applicable):
All criteria were within method requirements with any exceptions noted below.

Continuing Calibration:
All criteria were within method requirements with any exceptions noted below.

Internal Standards:
All internal standards were within QC limits with any exceptions noted below.

Surrogates:
All surrogates were within QC limits with any exceptions noted below.

Method Blank:
All analytes were below the report limit in the method blank with any exceptions noted below.

Laboratory Control Spike:
All laboratory control spike compounds were within QC limits with any exceptions noted below.

Matrix Spikes:
All percent recoveries and relative percent differences (RPDs) were within acceptance criteria with any exceptions noted below.

Duplicate Sample:
All duplicate sample results were within method acceptance criteria with any exceptions noted below.

Additional Comments:

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PROJECT NARRATIVE

Project: Black Pine Mine
Pace Project No.: 10163634

Method: **ASA 24-5.4/SM4500**
Description: SM4500P-E, Total Phosphorus
Client: Montana Dept. of Environmental Quality
Date: August 11, 2011

General Information:
3 samples were analyzed for ASA 24-5.4/SM4500. All samples were received in acceptable condition with any exceptions noted below.

Hold Time:
The samples were analyzed within the method required hold times with any exceptions noted below.

Initial Calibrations (including MS Tune as applicable):
All criteria were within method requirements with any exceptions noted below.

Continuing Calibration:
All criteria were within method requirements with any exceptions noted below.

Internal Standards:
All internal standards were within QC limits with any exceptions noted below.

Surrogates:
All surrogates were within QC limits with any exceptions noted below.

Method Blank:
All analytes were below the report limit in the method blank with any exceptions noted below.

Laboratory Control Spike:
All laboratory control spike compounds were within QC limits with any exceptions noted below.

Matrix Spikes:
All percent recoveries and relative percent differences (RPDs) were within acceptance criteria with any exceptions noted below.

Duplicate Sample:
All duplicate sample results were within method acceptance criteria with any exceptions noted below.

Additional Comments:

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PROJECT NARRATIVE

Project: Black Pine Mine
Pace Project No.: 10163634

Method: **Modified Sobek 3.2**
Description: Sobek Acid Base Potential
Client: Montana Dept. of Environmental Quality
Date: August 11, 2011

General Information:
9 samples were analyzed for Modified Sobek 3.2. All samples were received in acceptable condition with any exceptions noted below.

Hold Time:
The samples were analyzed within the method required hold times with any exceptions noted below.

Initial Calibrations (including MS Tune as applicable):
All criteria were within method requirements with any exceptions noted below.

Continuing Calibration:
All criteria were within method requirements with any exceptions noted below.

Internal Standards:
All internal standards were within QC limits with any exceptions noted below.

Surrogates:
All surrogates were within QC limits with any exceptions noted below.

Method Blank:
All analytes were below the report limit in the method blank with any exceptions noted below.

Laboratory Control Spike:
All laboratory control spike compounds were within QC limits with any exceptions noted below.

Matrix Spikes:
All percent recoveries and relative percent differences (RPDs) were within acceptance criteria with any exceptions noted below.

Duplicate Sample:
All duplicate sample results were within method acceptance criteria with any exceptions noted below.

Additional Comments:

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PROJECT NARRATIVE

Project: Black Pine Mine
Pace Project No.: 10163634

Method: **Modified Sobek 3.2**
Description: Sobek Extractable Sulfur
Client: Montana Dept. of Environmental Quality
Date: August 11, 2011

General Information:
9 samples were analyzed for Modified Sobek 3.2. All samples were received in acceptable condition with any exceptions noted below.

Hold Time:
The samples were analyzed within the method required hold times with any exceptions noted below.

Initial Calibrations (including MS Tune as applicable):
All criteria were within method requirements with any exceptions noted below.

Continuing Calibration:
All criteria were within method requirements with any exceptions noted below.

Internal Standards:
All internal standards were within QC limits with any exceptions noted below.

Surrogates:
All surrogates were within QC limits with any exceptions noted below.

Method Blank:
All analytes were below the report limit in the method blank with any exceptions noted below.

Laboratory Control Spike:
All laboratory control spike compounds were within QC limits with any exceptions noted below.

Matrix Spikes:
All percent recoveries and relative percent differences (RPDs) were within acceptance criteria with any exceptions noted below.

Duplicate Sample:
All duplicate sample results were within method acceptance criteria with any exceptions noted below.

Additional Comments:

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PROJECT NARRATIVE

Project: Black Pine Mine
Pace Project No.: 10163634

Method: **Modified Sobek 3.2**
Description: Sobek Calculations
Client: Montana Dept. of Environmental Quality
Date: August 11, 2011

General Information:
9 samples were analyzed for Modified Sobek 3.2. All samples were received in acceptable condition with any exceptions noted below.

Hold Time:
The samples were analyzed within the method required hold times with any exceptions noted below.

Initial Calibrations (including MS Tune as applicable):
All criteria were within method requirements with any exceptions noted below.

Continuing Calibration:
All criteria were within method requirements with any exceptions noted below.

Internal Standards:
All internal standards were within QC limits with any exceptions noted below.

Surrogates:
All surrogates were within QC limits with any exceptions noted below.

Method Blank:
All analytes were below the report limit in the method blank with any exceptions noted below.

Laboratory Control Spike:
All laboratory control spike compounds were within QC limits with any exceptions noted below.

Matrix Spikes:
All percent recoveries and relative percent differences (RPDs) were within acceptance criteria with any exceptions noted below.

Duplicate Sample:
All duplicate sample results were within method acceptance criteria with any exceptions noted below.

Additional Comments:

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PROJECT NARRATIVE

Project: Black Pine Mine
Pace Project No.: 10163634

Method: **Modified Sobek 3.2**
Description: Sobek SMP Buffer pH
Client: Montana Dept. of Environmental Quality
Date: August 11, 2011

General Information:
9 samples were analyzed for Modified Sobek 3.2. All samples were received in acceptable condition with any exceptions noted below.

Hold Time:
The samples were analyzed within the method required hold times with any exceptions noted below.

Initial Calibrations (including MS Tune as applicable):
All criteria were within method requirements with any exceptions noted below.

Continuing Calibration:
All criteria were within method requirements with any exceptions noted below.

Internal Standards:
All internal standards were within QC limits with any exceptions noted below.

Surrogates:
All surrogates were within QC limits with any exceptions noted below.

Method Blank:
All analytes were below the report limit in the method blank with any exceptions noted below.

Laboratory Control Spike:
All laboratory control spike compounds were within QC limits with any exceptions noted below.

Matrix Spikes:
All percent recoveries and relative percent differences (RPDs) were within acceptance criteria with any exceptions noted below.

Duplicate Sample:
All duplicate sample results were within method acceptance criteria with any exceptions noted below.

Additional Comments:

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PROJECT NARRATIVE

Project: Black Pine Mine
Pace Project No.: 10163634

Method: **ASA 10-3.3**
Description: ASA10-3.3 Specific Conductance
Client: Montana Dept. of Environmental Quality
Date: August 11, 2011

General Information:
2 samples were analyzed for ASA 10-3.3. All samples were received in acceptable condition with any exceptions noted below.

Hold Time:
The samples were analyzed within the method required hold times with any exceptions noted below.

Initial Calibrations (including MS Tune as applicable):
All criteria were within method requirements with any exceptions noted below.

Continuing Calibration:
All criteria were within method requirements with any exceptions noted below.

Internal Standards:
All internal standards were within QC limits with any exceptions noted below.

Surrogates:
All surrogates were within QC limits with any exceptions noted below.

Method Blank:
All analytes were below the report limit in the method blank with any exceptions noted below.

Laboratory Control Spike:
All laboratory control spike compounds were within QC limits with any exceptions noted below.

Matrix Spikes:
All percent recoveries and relative percent differences (RPDs) were within acceptance criteria with any exceptions noted below.

Duplicate Sample:
All duplicate sample results were within method acceptance criteria with any exceptions noted below.

QC Batch: MT/6547

D6: The relative percent difference (RPD) between the sample and sample duplicate exceeded laboratory control limits.

- DUP (Lab ID: 1022943)
  - Sp.Conductance Saturated Paste

Additional Comments:

This data package has been reviewed for quality and completeness and is approved for release.

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ANALYTICAL RESULTS

Project: Black Pine Mine
Pace Project No.: 10163634

Sample: BP-CMN-SS-04-00 **Lab ID: 10163634001** Collected: 07/14/11 12:45 Received: 07/16/11 20:03 Matrix: Solid

Results reported on a "dry-weight" basis

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
6020 MET ICPMS	Analytical Method: EPA 6020 Preparation Method: EPA 3050							
Antimony	**26.2**	mg/kg	0.54	20	08/01/11 15:14	08/04/11 17:30	7440-36-0	
Arsenic	**35.0**	mg/kg	0.54	20	08/01/11 15:14	08/04/11 17:30	7440-38-2	
Barium	**180**	mg/kg	0.33	20	08/01/11 15:14	08/04/11 17:30	7440-39-3	
Cadmium	**0.39**	mg/kg	0.087	20	08/01/11 15:14	08/04/11 17:30	7440-43-9	
Chromium	**4.1**	mg/kg	0.54	20	08/01/11 15:14	08/04/11 17:30	7440-47-3	
Copper	**57.8**	mg/kg	0.54	20	08/01/11 15:14	08/04/11 17:30	7440-50-8	
Iron	**8820**	mg/kg	54.4	20	08/01/11 15:14	08/04/11 17:30	7439-89-6	
Lead	**261**	mg/kg	0.11	20	08/01/11 15:14	08/04/11 17:30	7439-92-1	
Manganese	**480**	mg/kg	0.54	20	08/01/11 15:14	08/04/11 17:30	7439-96-5	
Nickel	**4.8**	mg/kg	0.54	20	08/01/11 15:14	08/04/11 17:30	7440-02-0	
Silver	**1.0**	mg/kg	0.54	20	08/01/11 15:14	08/04/11 17:30	7440-22-4	
Zinc	**81.5**	mg/kg	5.4	20	08/01/11 15:14	08/04/11 17:30	7440-66-6	
7471 Mercury	Analytical Method: EPA 7471 Preparation Method: EPA 7471							
Mercury	**<0.020**	mg/kg	0.020	1	07/28/11 19:18	08/01/11 16:23	7439-97-6	
Dry Weight	Analytical Method: % Moisture							
Percent Moisture	**10.8**	%	0.10	1		07/25/11 00:00		
Sobek Acid Base Potential	Analytical Method: Modified Sobek 3.2							
Neutralization Potential	**0.73**	tons/1000	0.50	1		08/01/11 00:00		
Sobek Extractable Sulfur	Analytical Method: Modified Sobek 3.2							
Sulfur, HCl Extractable	**<0.050**	% (w/w)	0.050	1		08/08/11 14:49		
Sulfur, HNO3 Extractable	**<0.050**	% (w/w)	0.050	1		08/08/11 14:49		
Sulfur, Hot Water Extractable	**<0.050**	% (w/w)	0.050	1		08/08/11 14:49		
Sulfur, Residual	**<0.050**	% (w/w)	0.050	1		08/08/11 14:49		
Total Sulfur	**<0.050**	% (w/w)	0.050	1		08/08/11 14:49		
Sobek Calculations	Analytical Method: Modified Sobek 3.2							
Acid/Base Potential	**3**	tons/1000		1		08/01/11 00:00		
Acid Potential	**<4.3**	tons/1000	4.3	1		08/01/11 00:00		
Lime Requirement	**<5.4**	tons/1000	5.4	1		08/01/11 00:00		
SMP Lime Requirement	**0**	tons/1000	0.0	1		08/01/11 00:00		
Sobek SMP Buffer pH	Analytical Method: Modified Sobek 3.2							
SMP Buffer pH	**7.3**	Std. Units	0.10	1		07/29/11 13:24		

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ANALYTICAL RESULTS

Project: Black Pine Mine
Pace Project No.: 10163634

Sample: BP-CMN-RS-04-02 **Lab ID: 10163634002** Collected: 07/14/11 12:35 Received: 07/16/11 20:03 Matrix: Solid

Results reported on a "dry-weight" basis

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
6020 MET ICPMS	Analytical Method: EPA 6020 Preparation Method: EPA 3050							
Antimony	**424**	mg/kg	0.76	20	08/01/11 15:14	08/04/11 17:38	7440-36-0	
Arsenic	**216**	mg/kg	0.76	20	08/01/11 15:14	08/04/11 17:38	7440-38-2	
Barium	**92.2**	mg/kg	0.45	20	08/01/11 15:14	08/04/11 17:38	7440-39-3	
Cadmium	**3.7**	mg/kg	0.12	20	08/01/11 15:14	08/04/11 17:38	7440-43-9	
Chromium	**1.3**	mg/kg	0.76	20	08/01/11 15:14	08/04/11 17:38	7440-47-3	
Copper	**309**	mg/kg	0.76	20	08/01/11 15:14	08/04/11 17:38	7440-50-8	
Iron	**9400**	mg/kg	75.8	20	08/01/11 15:14	08/04/11 17:38	7439-89-6	
Lead	**1910**	mg/kg	3.8	500	08/01/11 15:14	08/04/11 17:42	7439-92-1	
Manganese	**110**	mg/kg	0.76	20	08/01/11 15:14	08/04/11 17:38	7439-96-5	
Nickel	**1.5**	mg/kg	0.76	20	08/01/11 15:14	08/04/11 17:38	7440-02-0	
Silver	**50.2**	mg/kg	0.76	20	08/01/11 15:14	08/04/11 17:38	7440-22-4	
Zinc	**423**	mg/kg	7.6	20	08/01/11 15:14	08/04/11 17:38	7440-66-6	
7471 Mercury	Analytical Method: EPA 7471 Preparation Method: EPA 7471							
Mercury	**0.28**	mg/kg	0.024	1	07/28/11 19:18	08/01/11 16:25	7439-97-6	
Dry Weight	Analytical Method: % Moisture							
Percent Moisture	**35.4**	%	0.10	1		07/25/11 00:00		
Sobek Acid Base Potential	Analytical Method: Modified Sobek 3.2							
Neutralization Potential	**<0.5**	tons/1000	0.50	1		08/01/11 00:00		
Sobek Extractable Sulfur	Analytical Method: Modified Sobek 3.2							
Sulfur, HCl Extractable	**0.132**	% (w/w)	0.050	1		08/08/11 15:15		
Sulfur, HNO3 Extractable	**<0.050**	% (w/w)	0.050	1		08/08/11 15:15		
Sulfur, Hot Water Extractable	**0.223**	% (w/w)	0.050	1		08/08/11 15:15		
Sulfur, Residual	**<0.050**	% (w/w)	0.050	1		08/08/11 15:15		
Total Sulfur	**0.415**	% (w/w)	0.050	1		08/08/11 15:15		
Sobek Calculations	Analytical Method: Modified Sobek 3.2							
Acid/Base Potential	**-5.0**	tons/1000		1		08/01/11 00:00		
Acid Potential	**5.0**	tons/1000	4.3	1		08/01/11 00:00		
Lime Requirement	**7.5**	tons/1000	5.4	1		08/01/11 00:00		
SMP Lime Requirement	**1.0**	tons/1000	0.0	1		08/01/11 00:00		
Sobek SMP Buffer pH	Analytical Method: Modified Sobek 3.2							
SMP Buffer pH	**6.8**	Std. Units	0.10	1		07/29/11 13:24		

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ANALYTICAL RESULTS

Project: Black Pine Mine
Pace Project No.: 10163634

Sample: BP-CMN-RS-04-05 **Lab ID: 10163634003** Collected: 07/14/11 12:40 Received: 07/16/11 20:03 Matrix: Solid

Results reported on a "dry-weight" basis

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
6020 MET ICPMS	Analytical Method: EPA 6020 Preparation Method: EPA 3050							
Antimony	**986**	mg/kg	18.3	500	08/01/11 15:14	08/04/11 17:51	7440-36-0	
Arsenic	**439**	mg/kg	0.73	20	08/01/11 15:14	08/04/11 17:47	7440-38-2	
Barium	**114**	mg/kg	0.44	20	08/01/11 15:14	08/04/11 17:47	7440-39-3	
Cadmium	**10.2**	mg/kg	0.12	20	08/01/11 15:14	08/04/11 17:47	7440-43-9	
Chromium	**0.90**	mg/kg	0.73	20	08/01/11 15:14	08/04/11 17:47	7440-47-3	
Copper	**464**	mg/kg	0.73	20	08/01/11 15:14	08/04/11 17:47	7440-50-8	
Iron	**19400**	mg/kg	73.3	20	08/01/11 15:14	08/04/11 17:47	7439-89-6	
Lead	**2750**	mg/kg	3.7	500	08/01/11 15:14	08/04/11 17:51	7439-92-1	
Manganese	**36.8**	mg/kg	0.73	20	08/01/11 15:14	08/04/11 17:47	7439-96-5	
Nickel	**1.1**	mg/kg	0.73	20	08/01/11 15:14	08/04/11 17:47	7440-02-0	
Silver	**155**	mg/kg	0.73	20	08/01/11 15:14	08/04/11 17:47	7440-22-4	
Zinc	**1040**	mg/kg	183	500	08/01/11 15:14	08/04/11 17:51	7440-66-6	
7471 Mercury	Analytical Method: EPA 7471 Preparation Method: EPA 7471							
Mercury	**0.13**	mg/kg	0.030	1	07/28/11 19:18	08/01/11 16:27	7439-97-6	
Dry Weight	Analytical Method: % Moisture							
Percent Moisture	**34.4**	%	0.10	1		07/25/11 00:00		
Sobek Acid Base Potential	Analytical Method: Modified Sobek 3.2							
Neutralization Potential	**<0.5**	tons/1000	0.50	1		08/01/11 00:00		
Sobek Extractable Sulfur	Analytical Method: Modified Sobek 3.2							
Sulfur, HCl Extractable	**0.127**	% (w/w)	0.050	1		08/08/11 15:27		
Sulfur, HNO3 Extractable	**0.108**	% (w/w)	0.050	1		08/08/11 15:27		
Sulfur, Hot Water Extractable	**0.276**	% (w/w)	0.050	1		08/08/11 15:27		
Sulfur, Residual	**<0.050**	% (w/w)	0.050	1		08/08/11 15:27		
Total Sulfur	**0.512**	% (w/w)	0.050	1		08/08/11 15:27		
Sobek Calculations	Analytical Method: Modified Sobek 3.2							
Acid/Base Potential	**-6.4**	tons/1000		1		08/01/11 00:00		
Acid Potential	**6.4**	tons/1000	4.3	1		08/01/11 00:00		
Lime Requirement	**9.2**	tons/1000	5.4	1		08/01/11 00:00		
SMP Lime Requirement	**1.0**	tons/1000	0.0	1		08/01/11 00:00		
Sobek SMP Buffer pH	Analytical Method: Modified Sobek 3.2							
SMP Buffer pH	**6.8**	Std. Units	0.10	1		07/29/11 13:24		

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ANALYTICAL RESULTS

Project: Black Pine Mine
Pace Project No.: 10163634

Sample: BP-CMN-SS-04-08 **Lab ID: 10163634004** Collected: 07/14/11 12:30 Received: 07/16/11 20:03 Matrix: Solid

Results reported on a "dry-weight" basis

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
6020 MET ICPMS	Analytical Method: EPA 6020 Preparation Method: EPA 3050							
Antimony	**0.74**	mg/kg	0.56	20	08/01/11 15:14	08/04/11 17:55	7440-36-0	
Arsenic	**7.9**	mg/kg	0.56	20	08/01/11 15:14	08/04/11 17:55	7440-38-2	
Barium	**63.0**	mg/kg	0.33	20	08/01/11 15:14	08/04/11 17:55	7440-39-3	
Cadmium	**0.11**	mg/kg	0.089	20	08/01/11 15:14	08/04/11 17:55	7440-43-9	
Chromium	**3.7**	mg/kg	0.56	20	08/01/11 15:14	08/04/11 17:55	7440-47-3	
Copper	**26.8**	mg/kg	0.56	20	08/01/11 15:14	08/04/11 17:55	7440-50-8	
Iron	**5680**	mg/kg	55.5	20	08/01/11 15:14	08/04/11 17:55	7439-89-6	
Lead	**5.3**	mg/kg	0.11	20	08/01/11 15:14	08/04/11 17:55	7439-92-1	
Manganese	**56.9**	mg/kg	0.56	20	08/01/11 15:14	08/04/11 17:55	7439-96-5	
Nickel	**2.5**	mg/kg	0.56	20	08/01/11 15:14	08/04/11 17:55	7440-02-0	
Silver	**<0.56**	mg/kg	0.56	20	08/01/11 15:14	08/04/11 17:55	7440-22-4	
Zinc	**17.7**	mg/kg	5.6	20	08/01/11 15:14	08/04/11 17:55	7440-66-6	
7471 Mercury	Analytical Method: EPA 7471 Preparation Method: EPA 7471							
Mercury	**<0.023**	mg/kg	0.023	1	07/28/11 19:18	08/01/11 16:29	7439-97-6	
Dry Weight	Analytical Method: % Moisture							
Percent Moisture	**12.6**	%	0.10	1		07/25/11 00:00		

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ANALYTICAL RESULTS

Project: Black Pine Mine
Pace Project No.: 10163634

Sample: BP-CMN-SS-07-00 **Lab ID: 10163634005** Collected: 07/14/11 12:35 Received: 07/16/11 20:03 Matrix: Solid

Results reported on a "dry-weight" basis

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
6020 MET ICPMS	Analytical Method: EPA 6020 Preparation Method: EPA 3050							
Antimony	**1.5**	mg/kg	0.55	20	08/01/11 15:14	08/04/11 18:03	7440-36-0	
Arsenic	**12.2**	mg/kg	0.55	20	08/01/11 15:14	08/04/11 18:03	7440-38-2	
Barium	**85.4**	mg/kg	0.33	20	08/01/11 15:14	08/04/11 18:03	7440-39-3	
Cadmium	**0.41**	mg/kg	0.088	20	08/01/11 15:14	08/04/11 18:03	7440-43-9	
Chromium	**12.2**	mg/kg	0.55	20	08/01/11 15:14	08/04/11 18:03	7440-47-3	
Copper	**30.9**	mg/kg	0.55	20	08/01/11 15:14	08/04/11 18:03	7440-50-8	
Iron	**15300**	mg/kg	54.7	20	08/01/11 15:14	08/04/11 18:03	7439-89-6	
Lead	**19.7**	mg/kg	0.11	20	08/01/11 15:14	08/04/11 18:03	7439-92-1	
Manganese	**252**	mg/kg	0.55	20	08/01/11 15:14	08/04/11 18:03	7439-96-5	
Nickel	**8.2**	mg/kg	0.55	20	08/01/11 15:14	08/04/11 18:03	7440-02-0	
Silver	**<0.55**	mg/kg	0.55	20	08/01/11 15:14	08/04/11 18:03	7440-22-4	
Zinc	**57.0**	mg/kg	5.5	20	08/01/11 15:14	08/04/11 18:03	7440-66-6	
7471 Mercury	Analytical Method: EPA 7471 Preparation Method: EPA 7471							
Mercury	**<0.021**	mg/kg	0.021	1	07/28/11 19:18	08/01/11 16:35	7439-97-6	
Dry Weight	Analytical Method: % Moisture							
Percent Moisture	**8.6**	%	0.10	1		07/25/11 00:00		
Sobek Acid Base Potential	Analytical Method: Modified Sobek 3.2							
Neutralization Potential	**1.2**	tons/1000	0.50	1		08/01/11 00:00		
Sobek Extractable Sulfur	Analytical Method: Modified Sobek 3.2							
Sulfur, HCl Extractable	**<0.050**	% (w/w)	0.050	1		08/09/11 07:32		
Sulfur, HNO3 Extractable	**<0.050**	% (w/w)	0.050	1		08/09/11 07:32		
Sulfur, Hot Water Extractable	**<0.050**	% (w/w)	0.050	1		08/09/11 07:32		
Sulfur, Residual	**<0.050**	% (w/w)	0.050	1		08/09/11 07:32		
Total Sulfur	**<0.050**	% (w/w)	0.050	1		08/09/11 07:32		
Sobek Calculations	Analytical Method: Modified Sobek 3.2							
Acid/Base Potential	**1.2**	tons/1000		1		08/01/11 00:00		
Acid Potential	**<4.3**	tons/1000	4.3	1		08/01/11 00:00		
Lime Requirement	**<5.4**	tons/1000	5.4	1		08/01/11 00:00		
SMP Lime Requirement	**0**	tons/1000	0.0	1		08/01/11 00:00		
Sobek SMP Buffer pH	Analytical Method: Modified Sobek 3.2							
SMP Buffer pH	**7.1**	Std. Units	0.10	1		07/29/11 13:24		

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ANALYTICAL RESULTS

Project: Black Pine Mine
Pace Project No.: 10163634

Sample: BP-CMN-SS-07-06 **Lab ID: 10163634006** Collected: 07/14/11 13:40 Received: 07/16/11 20:03 Matrix: Solid

Results reported on a "dry-weight" basis

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
6010 MET ICP, MDEQ Potassium	Analytical Method: CLPICPAES Preparation Method: ASA 13-3.5.2.2							
Potassium	**<122**	mg/kg	122	5	08/01/11 17:34	08/01/11 18:50	7440-09-7	
Cation Exchange Capacity	Analytical Method: EPA 9081							
Cation Exchange Capacity	**22.1**	meq/100g	0.98	10	08/03/11 14:00	08/05/11 13:47		
6020 MET ICPMS	Analytical Method: EPA 6020 Preparation Method: EPA 3050							
Antimony	**1.3**	mg/kg	0.55	20	08/01/11 15:14	08/04/11 18:24	7440-36-0	
Arsenic	**12.4**	mg/kg	0.55	20	08/01/11 15:14	08/04/11 18:24	7440-38-2	
Barium	**111**	mg/kg	0.33	20	08/01/11 15:14	08/04/11 18:24	7440-39-3	
Cadmium	**<0.088**	mg/kg	0.088	20	08/01/11 15:14	08/04/11 18:24	7440-43-9	
Chromium	**11.9**	mg/kg	0.55	20	08/01/11 15:14	08/04/11 18:24	7440-47-3	
Copper	**14.9**	mg/kg	0.55	20	08/01/11 15:14	08/04/11 18:24	7440-50-8	
Iron	**14000**	mg/kg	55.2	20	08/01/11 15:14	08/04/11 18:24	7439-89-6	
Lead	**24.8**	mg/kg	0.11	20	08/01/11 15:14	08/04/11 18:24	7439-92-1	
Manganese	**393**	mg/kg	0.55	20	08/01/11 15:14	08/04/11 18:24	7439-96-5	
Nickel	**9.7**	mg/kg	0.55	20	08/01/11 15:14	08/04/11 18:24	7440-02-0	
Silver	**<0.55**	mg/kg	0.55	20	08/01/11 15:14	08/04/11 18:24	7440-22-4	
Zinc	**30.5**	mg/kg	5.5	20	08/01/11 15:14	08/04/11 18:24	7440-66-6	
7471 Mercury	Analytical Method: EPA 7471 Preparation Method: EPA 7471							
Mercury	**<0.020**	mg/kg	0.020	1	07/28/11 19:18	08/01/11 16:37	7439-97-6	
Dry Weight	Analytical Method: % Moisture							
Percent Moisture	**10.3**	%	0.10	1		07/25/11 00:00		
353.2 Nitrate + Nitrite pres.	Analytical Method: ASA 33-3.2/EPA 353.2							
Available Nitrate	**<5.0**	mg/kg	5.0	1		07/26/11 18:04		
Coarse	Analytical Method: ASTM D421							
Coarse Fragment	**19.3**	% (w/w)	0.10	1		07/26/11 12:15		
Organic Matter MT ASA 29	Analytical Method: ASA 29-3.5.2							
Organic Matter	**<0.10**	% (w/w)	0.10	1		07/21/11 16:50		
ASA 10-3.2 pH	Analytical Method: ASA 10-3.2							
pH, Saturated Paste	**7.2**	Std. Units	0.10	1		07/27/11 17:35		
SM4500P-E, Total Phosphorus	Analytical Method: ASA 24-5.4/SM4500							
Available Phosphorus	**<1.0**	mg/kg	1.0	1		07/25/11 14:44	7723-14-0	
Sobek Acid Base Potential	Analytical Method: Modified Sobek 3.2							
Neutralization Potential	**2.0**	tons/1000	0.50	1		07/29/11 00:00		

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ANALYTICAL RESULTS

Project: Black Pine Mine
Pace Project No.: 10163634

Sample: BP-CMN-SS-07-06 **Lab ID: 10163634006** Collected: 07/14/11 13:40 Received: 07/16/11 20:03 Matrix: Solid

Results reported on a "dry-weight" basis

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
Sobek Extractable Sulfur	Analytical Method: Modified Sobek 3.2							
Sulfur, HCl Extractable	**<0.050**	% (w/w)	0.050	1		07/26/11 15:00		
Sulfur, HNO3 Extractable	**<0.050**	% (w/w)	0.050	1		07/26/11 15:00		
Sulfur, Hot Water Extractable	**<0.050**	% (w/w)	0.050	1		07/26/11 15:00		
Sulfur, Residual	**<0.050**	% (w/w)	0.050	1		07/26/11 15:00		
Total Sulfur	**<0.050**	% (w/w)	0.050	1		07/26/11 15:00		
Sobek Calculations	Analytical Method: Modified Sobek 3.2							
Acid/Base Potential	**2.0**	tons/1000		1		07/26/11 15:00		
Acid Potential	**<4.3**	tons/1000	4.3	1		07/26/11 15:00		
Lime Requirement	**<5.4**	tons/1000	5.4	1		07/26/11 15:00		
SMP Lime Requirement	**0.3**	tons/1000	0.0	1		07/26/11 15:00		
Sobek SMP Buffer pH	Analytical Method: Modified Sobek 3.2							
SMP Buffer pH	**6.8**	Std. Units	0.10	1		07/26/11 15:00		

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ANALYTICAL RESULTS

Project: Black Pine Mine
Pace Project No.: 10163634

Sample: BP-CMN-SS-08-00 **Lab ID: 10163634007** Collected: 07/14/11 14:05 Received: 07/16/11 20:03 Matrix: Solid

Results reported on a "dry-weight" basis

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
6020 MET ICPMS	Analytical Method: EPA 6020 Preparation Method: EPA 3050							
Antimony	**3.3**	mg/kg	0.60	20	08/01/11 15:14	08/04/11 04:14	7440-36-0	M6
Arsenic	**14.4**	mg/kg	0.60	20	08/01/11 15:14	08/04/11 04:14	7440-38-2	M6
Barium	**64.7**	mg/kg	0.36	20	08/01/11 15:14	08/04/11 04:14	7440-39-3	M6
Cadmium	**1.6**	mg/kg	0.096	20	08/01/11 15:14	08/04/11 04:14	7440-43-9	M6
Chromium	**7.6**	mg/kg	0.60	20	08/01/11 15:14	08/04/11 04:14	7440-47-3	M6
Copper	**220**	mg/kg	0.60	20	08/01/11 15:14	08/04/11 04:14	7440-50-8	M6
Iron	**11000**	mg/kg	59.8	20	08/01/11 15:14	08/04/11 04:14	7439-89-6	M6
Lead	**24.4**	mg/kg	0.12	20	08/01/11 15:14	08/04/11 04:14	7439-92-1	M6
Manganese	**419**	mg/kg	0.60	20	08/01/11 15:14	08/04/11 04:14	7439-96-5	M6
Nickel	**4.8**	mg/kg	0.60	20	08/01/11 15:14	08/04/11 04:14	7440-02-0	M6
Silver	**<0.60**	mg/kg	0.60	20	08/01/11 15:14	08/04/11 04:14	7440-22-4	M6
Zinc	**101**	mg/kg	6.0	20	08/01/11 15:14	08/04/11 04:14	7440-66-6	M6
7471 Mercury	Analytical Method: EPA 7471 Preparation Method: EPA 7471							
Mercury	**<0.022**	mg/kg	0.022	1	07/28/11 19:18	08/01/11 16:39	7439-97-6	
Dry Weight	Analytical Method: % Moisture							
Percent Moisture	**16.4**	%	0.10	1		07/25/11 00:00		
Sobek Acid Base Potential	Analytical Method: Modified Sobek 3.2							
Neutralization Potential	**1.7**	tons/1000	0.50	1		08/01/11 00:00		
Sobek Extractable Sulfur	Analytical Method: Modified Sobek 3.2							
Sulfur, HCl Extractable	**<0.050**	% (w/w)	0.050	1		08/09/11 07:41		
Sulfur, HNO3 Extractable	**<0.050**	% (w/w)	0.050	1		08/09/11 07:41		
Sulfur, Hot Water Extractable	**<0.050**	% (w/w)	0.050	1		08/09/11 07:41		
Sulfur, Residual	**<0.050**	% (w/w)	0.050	1		08/09/11 07:41		
Total Sulfur	**<0.050**	% (w/w)	0.050	1		08/09/11 07:41		
Sobek Calculations	Analytical Method: Modified Sobek 3.2							
Acid/Base Potential	**1.7**	tons/1000		1		08/01/11 00:00		
Acid Potential	**<4.3**	tons/1000	4.3	1		08/01/11 00:00		
Lime Requirement	**<5.4**	tons/1000	5.4	1		08/01/11 00:00		
SMP Lime Requirement	**0**	tons/1000	0.0	1		08/01/11 00:00		
Sobek SMP Buffer pH	Analytical Method: Modified Sobek 3.2							
SMP Buffer pH	**7.0**	Std. Units	0.10	1		07/29/11 13:24		

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ANALYTICAL RESULTS

Project: Black Pine Mine
Pace Project No.: 10163634

Sample: BP-CMN-SS-08-03 **Lab ID: 10163634008** Collected: 07/14/11 14:10 Received: 07/16/11 20:03 Matrix: Solid

Results reported on a "dry-weight" basis

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
6010 MET ICP, MDEQ Potassium	Analytical Method: CLPICPAES Preparation Method: ASA 13-3.5.2.2							
Potassium	**<116**	mg/kg	116	5	08/01/11 17:34	08/01/11 18:54	7440-09-7	
Cation Exchange Capacity	Analytical Method: EPA 9081							
Cation Exchange Capacity	**22.1**	meq/100g	0.98	10	08/03/11 14:00	08/05/11 13:51		
6020 MET ICPMS	Analytical Method: EPA 6020 Preparation Method: EPA 3050							
Antimony	**1.1**	mg/kg	0.62	20	08/01/11 15:14	08/04/11 18:33	7440-36-0	
Arsenic	**7.6**	mg/kg	0.62	20	08/01/11 15:14	08/04/11 18:33	7440-38-2	
Barium	**136**	mg/kg	0.37	20	08/01/11 15:14	08/04/11 18:33	7440-39-3	
Cadmium	**0.71**	mg/kg	0.10	20	08/01/11 15:14	08/04/11 18:33	7440-43-9	
Chromium	**8.4**	mg/kg	0.62	20	08/01/11 15:14	08/04/11 18:33	7440-47-3	
Copper	**124**	mg/kg	0.62	20	08/01/11 15:14	08/04/11 18:33	7440-50-8	
Iron	**10300**	mg/kg	62.3	20	08/01/11 15:14	08/04/11 18:33	7439-89-6	
Lead	**14.8**	mg/kg	0.12	20	08/01/11 15:14	08/04/11 18:33	7439-92-1	
Manganese	**193**	mg/kg	0.62	20	08/01/11 15:14	08/04/11 18:33	7439-96-5	
Nickel	**5.6**	mg/kg	0.62	20	08/01/11 15:14	08/04/11 18:33	7440-02-0	
Silver	**<0.62**	mg/kg	0.62	20	08/01/11 15:14	08/04/11 18:33	7440-22-4	
Zinc	**62.7**	mg/kg	6.2	20	08/01/11 15:14	08/04/11 18:33	7440-66-6	
7471 Mercury	Analytical Method: EPA 7471 Preparation Method: EPA 7471							
Mercury	**<0.021**	mg/kg	0.021	1	07/28/11 19:18	08/01/11 16:42	7439-97-6	M1
Dry Weight	Analytical Method: % Moisture							
Percent Moisture	**22.9**	%	0.10	1		07/25/11 00:00		
353.2 Nitrate + Nitrite pres.	Analytical Method: ASA 33-3.2/EPA 353.2							
Available Nitrate	**<5.0**	mg/kg	5.0	1		07/26/11 18:06		
Coarse	Analytical Method: ASTM D421							
Coarse Fragment	**19.3**	% (w/w)	0.10	1		07/26/11 12:15		
Organic Matter MT ASA 29	Analytical Method: ASA 29-3.5.2							
Organic Matter	**0.13**	% (w/w)	0.10	1		07/21/11 16:50		
ASA 10-3.2 pH	Analytical Method: ASA 10-3.2							
pH, Saturated Paste	**6.8**	Std. Units	0.10	1		07/27/11 17:35		
SM4500P-E, Total Phosphorus	Analytical Method: ASA 24-5.4/SM4500							
Available Phosphorus	**1.6**	mg/kg	1.0	1		07/25/11 14:47	7723-14-0	
Sobek Acid Base Potential	Analytical Method: Modified Sobek 3.2							
Neutralization Potential	**1.7**	tons/1000	0.50	1		07/29/11 00:00		

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ANALYTICAL RESULTS

Project: Black Pine Mine
Pace Project No.: 10163634

Sample: BP-CMN-SS-08-03 **Lab ID: 10163634008** Collected: 07/14/11 14:10 Received: 07/16/11 20:03 Matrix: Solid

Results reported on a "dry-weight" basis

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
Sobek Extractable Sulfur	Analytical Method: Modified Sobek 3.2							
Sulfur, HCl Extractable	**<0.050**	% (w/w)	0.050	1		07/26/11 15:00		
Sulfur, HNO3 Extractable	**<0.050**	% (w/w)	0.050	1		07/26/11 15:00		
Sulfur, Hot Water Extractable	**<0.050**	% (w/w)	0.050	1		07/26/11 15:00		
Sulfur, Residual	**<0.050**	% (w/w)	0.050	1		07/26/11 15:00		
Total Sulfur	**<0.050**	% (w/w)	0.050	1		07/26/11 15:00		
Sobek Calculations	Analytical Method: Modified Sobek 3.2							
Acid/Base Potential	**1.7**	tons/1000		1		07/26/11 15:00		
Acid Potential	**<4.3**	tons/1000	4.3	1		07/26/11 15:00		
Lime Requirement	**<5.4**	tons/1000	5.4	1		07/26/11 15:00		
SMP Lime Requirement	**1**	tons/1000	0.0	1		07/26/11 15:00		
Sobek SMP Buffer pH	Analytical Method: Modified Sobek 3.2							
SMP Buffer pH	**6.8**	Std. Units	0.10	1		07/26/11 15:00		
ASA10-3.3 Specific Conductance	Analytical Method: ASA 10-3.3							
Sp.Conductance Saturated Paste	**323**	mmhos/cm	0.010	1		08/03/11 19:49		

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ANALYTICAL RESULTS

Project: Black Pine Mine
Pace Project No.: 10163634

Sample: BP-CMN-SS-09-00 **Lab ID: 10163634009** Collected: 07/14/11 14:30 Received: 07/16/11 20:03 Matrix: Solid

Results reported on a "dry-weight" basis

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
6020 MET ICPMS	Analytical Method: EPA 6020 Preparation Method: EPA 3050							
Antimony	**1.4**	mg/kg	0.55	20	08/01/11 15:14	08/04/11 18:41	7440-36-0	
Arsenic	**9.7**	mg/kg	0.55	20	08/01/11 15:14	08/04/11 18:41	7440-38-2	
Barium	**250**	mg/kg	0.33	20	08/01/11 15:14	08/04/11 18:41	7440-39-3	
Cadmium	**2.7**	mg/kg	0.088	20	08/01/11 15:14	08/04/11 18:41	7440-43-9	
Chromium	**7.8**	mg/kg	0.55	20	08/01/11 15:14	08/04/11 18:41	7440-47-3	
Copper	**489**	mg/kg	54.9	2000	08/01/11 15:14	08/04/11 18:45	7440-50-8	
Iron	**8270**	mg/kg	54.9	20	08/01/11 15:14	08/04/11 18:41	7439-89-6	
Lead	**21.0**	mg/kg	0.11	20	08/01/11 15:14	08/04/11 18:41	7439-92-1	
Manganese	**460**	mg/kg	54.9	2000	08/01/11 15:14	08/04/11 18:45	7439-96-5	
Nickel	**5.3**	mg/kg	0.55	20	08/01/11 15:14	08/04/11 18:41	7440-02-0	
Silver	**0.66**	mg/kg	0.55	20	08/01/11 15:14	08/04/11 18:41	7440-22-4	
Zinc	**131**	mg/kg	5.5	20	08/01/11 15:14	08/04/11 18:41	7440-66-6	
7471 Mercury	Analytical Method: EPA 7471 Preparation Method: EPA 7471							
Mercury	**0.12**	mg/kg	0.022	1	07/28/11 16:35	07/31/11 09:29	7439-97-6	M1
Dry Weight	Analytical Method: % Moisture							
Percent Moisture	**16.4**	%	0.10	1		07/25/11 00:00		
Sobek Acid Base Potential	Analytical Method: Modified Sobek 3.2							
Neutralization Potential	**1.2**	tons/1000	0.50	1		08/01/11 00:00		
Sobek Extractable Sulfur	Analytical Method: Modified Sobek 3.2							
Sulfur, HCl Extractable	**<0.050**	% (w/w)	0.050	1		08/09/11 08:00		
Sulfur, HNO3 Extractable	**<0.050**	% (w/w)	0.050	1		08/09/11 08:00		
Sulfur, Hot Water Extractable	**<0.050**	% (w/w)	0.050	1		08/09/11 08:00		
Sulfur, Residual	**<0.050**	% (w/w)	0.050	1		08/09/11 08:00		
Total Sulfur	**<0.050**	% (w/w)	0.050	1		08/09/11 08:00		
Sobek Calculations	Analytical Method: Modified Sobek 3.2							
Acid/Base Potential	**1.2**	tons/1000		1		08/01/11 00:00		
Acid Potential	**<4.3**	tons/1000	4.3	1		08/01/11 00:00		
Lime Requirement	**<5.4**	tons/1000	5.4	1		08/01/11 00:00		
SMP Lime Requirement	**3.9**	tons/1000	0.0	1		08/01/11 00:00		
Sobek SMP Buffer pH	Analytical Method: Modified Sobek 3.2							
SMP Buffer pH	**6.4**	Std. Units	0.10	1		07/29/11 13:24		

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ANALYTICAL RESULTS

Project: Black Pine Mine
Pace Project No.: 10163634

Sample: BP-CMN-SS-09-04 **Lab ID: 10163634010** Collected: 07/14/11 14:45 Received: 07/16/11 20:03 Matrix: Solid

Results reported on a "dry-weight" basis

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
6010 MET ICP, MDEQ Potassium	Analytical Method: CLPICPAES Preparation Method: ASA 13-3.5.2.2							
Potassium	**<125**	mg/kg	125	5	08/01/11 17:34	08/01/11 19:11	7440-09-7	
Cation Exchange Capacity	Analytical Method: EPA 9081							
Cation Exchange Capacity	**16.3**	meq/100g	1.0	10	08/03/11 14:00	08/05/11 13:54		
6020 MET ICPMS	Analytical Method: EPA 6020 Preparation Method: EPA 3050							
Antimony	**0.67**	mg/kg	0.57	20	08/01/11 15:14	08/04/11 18:50	7440-36-0	
Arsenic	**8.1**	mg/kg	0.57	20	08/01/11 15:14	08/04/11 18:50	7440-38-2	
Barium	**185**	mg/kg	0.34	20	08/01/11 15:14	08/04/11 18:50	7440-39-3	
Cadmium	**1.7**	mg/kg	0.091	20	08/01/11 15:14	08/04/11 18:50	7440-43-9	
Chromium	**12.1**	mg/kg	0.57	20	08/01/11 15:14	08/04/11 18:50	7440-47-3	
Copper	**58.4**	mg/kg	0.57	20	08/01/11 15:14	08/04/11 18:50	7440-50-8	
Iron	**14400**	mg/kg	56.6	20	08/01/11 15:14	08/04/11 18:50	7439-89-6	
Lead	**20.4**	mg/kg	0.11	20	08/01/11 15:14	08/04/11 18:50	7439-92-1	
Manganese	**243**	mg/kg	0.57	20	08/01/11 15:14	08/04/11 18:50	7439-96-5	
Nickel	**7.1**	mg/kg	0.57	20	08/01/11 15:14	08/04/11 18:50	7440-02-0	
Silver	**<0.57**	mg/kg	0.57	20	08/01/11 15:14	08/04/11 18:50	7440-22-4	
Zinc	**129**	mg/kg	5.7	20	08/01/11 15:14	08/04/11 18:50	7440-66-6	
7471 Mercury	Analytical Method: EPA 7471 Preparation Method: EPA 7471							
Mercury	**61.3**	mg/kg	5.5	250	07/28/11 16:35	07/31/11 09:48	7439-97-6	
Dry Weight	Analytical Method: % Moisture							
Percent Moisture	**11.6**	%	0.10	1		07/25/11 00:00		
353.2 Nitrate + Nitrite pres.	Analytical Method: ASA 33-3.2/EPA 353.2							
Available Nitrate	**<5.0**	mg/kg	5.0	1		07/26/11 18:07		
Coarse	Analytical Method: ASTM D421							
Coarse Fragment	**22.1**	% (w/w)	0.10	1		07/26/11 12:15		
Organic Matter MT ASA 29	Analytical Method: ASA 29-3.5.2							
Organic Matter	**<0.10**	% (w/w)	0.10	1		07/21/11 16:50		
ASA 10-3.2 pH	Analytical Method: ASA 10-3.2							
pH, Saturated Paste	**6.1**	Std. Units	0.10	1		07/27/11 17:36		
SM4500P-E, Total Phosphorus	Analytical Method: ASA 24-5.4/SM4500							
Available Phosphorus	**3.2**	mg/kg	1.0	1		07/25/11 14:47	7723-14-0	
Sobek Acid Base Potential	Analytical Method: Modified Sobek 3.2							
Neutralization Potential	**3.7**	tons/1000	0.50	1		07/29/11 00:00		

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ANALYTICAL RESULTS

Project: Black Pine Mine
Pace Project No.: 10163634

Sample: BP-CMN-SS-09-04 **Lab ID: 10163634010** Collected: 07/14/11 14:45 Received: 07/16/11 20:03 Matrix: Solid

Results reported on a "dry-weight" basis

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
Sobek Extractable Sulfur	Analytical Method: Modified Sobek 3.2							
Sulfur, HCl Extractable	**<0.050**	% (w/w)	0.050	1		07/26/11 15:00		
Sulfur, HNO3 Extractable	**<0.050**	% (w/w)	0.050	1		07/26/11 15:00		
Sulfur, Hot Water Extractable	**<0.050**	% (w/w)	0.050	1		07/26/11 15:00		
Sulfur, Residual	**<0.050**	% (w/w)	0.050	1		07/26/11 15:00		
Total Sulfur	**<0.050**	% (w/w)	0.050	1		07/26/11 15:00		
Sobek Calculations	Analytical Method: Modified Sobek 3.2							
Acid/Base Potential	**3.7**	tons/1000		1		07/26/11 15:00		
Acid Potential	**<4.3**	tons/1000	4.3	1		07/26/11 15:00		
Lime Requirement	**<5.4**	tons/1000	5.4	1		07/26/11 15:00		
SMP Lime Requirement	**0.3**	tons/1000	0.0	1		07/26/11 15:00		
Sobek SMP Buffer pH	Analytical Method: Modified Sobek 3.2							
SMP Buffer pH	**6.9**	Std. Units	0.10	1		07/26/11 15:00		
ASA10-3.3 Specific Conductance	Analytical Method: ASA 10-3.3							
Sp.Conductance Saturated Paste	**1.0**	mmhos/cm	0.010	1		07/27/11 12:56		

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QUALITY CONTROL DATA

Project: Black Pine Mine
Pace Project No.: 10163634

QC Batch: MPRP/27469 Analysis Method: CLPICPAES
QC Batch Method: ASA 13-3.5.2.2 Analysis Description: CLPICPAES MET
Associated Lab Samples: 10163634006, 10163634008, 10163634010

METHOD BLANK: 1024549 Matrix: Solid
Associated Lab Samples: 10163634006, 10163634008, 10163634010

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Potassium	mg/kg	<124	124	08/01/11 17:43	

LABORATORY CONTROL SAMPLE & LCSD: 1024550 1024551

Parameter	Units	Spike Conc.	LCS Result	LCSD Result	LCS % Rec	LCSD % Rec	% Rec Limits	RPD	Max RPD	Qualifiers
Potassium	mg/kg	156	177	210	114	135	80-120	17	20	

SAMPLE DUPLICATE: 1024552

Parameter	Units	10163634008 Result	Dup Result	RPD	Max RPD	Qualifiers
Potassium	mg/kg	<116	<125		30	

SAMPLE DUPLICATE: 1024553

Parameter	Units	10163644010 Result	Dup Result	RPD	Max RPD	Qualifiers
Potassium	mg/kg	<123	<125		30	

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QUALITY CONTROL DATA

Project: Black Pine Mine
Pace Project No.: 10163634

QC Batch: ICP/14917 Analysis Method: EPA 9081
QC Batch Method: EPA 9081 Analysis Description: Cation Exchange Capacity
Associated Lab Samples: 10163634006, 10163634008, 10163634010

METHOD BLANK: 853094 Matrix: Solid
Associated Lab Samples: 10163634006, 10163634008, 10163634010

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Cation Exchange Capacity	meq/100g	<1.0	1.0	08/05/11 13:25	

LABORATORY CONTROL SAMPLE: 853095

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Cation Exchange Capacity	meq/100g	53.2	53.1	100	62-138	

SAMPLE DUPLICATE: 853096

Parameter	Units	10163645001 Result	Dup Result	RPD	Max RPD	Qualifiers
Cation Exchange Capacity	meq/100g	14.7	14.1	4	47	

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QUALITY CONTROL DATA

Project: Black Pine Mine
Pace Project No.: 10163634

QC Batch: MPRP/27167 Analysis Method: EPA 6020
QC Batch Method: EPA 3050 Analysis Description: 6020 MET
Associated Lab Samples: 10163634001, 10163634002, 10163634003, 10163634004, 10163634005, 10163634006, 10163634007, 10163634008, 10163634009, 10163634010

METHOD BLANK: 1014853 Matrix: Solid
Associated Lab Samples: 10163634001, 10163634002, 10163634003, 10163634004, 10163634005, 10163634006, 10163634007, 10163634008, 10163634009, 10163634010

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Antimony	mg/kg	<0.49	0.49	08/04/11 03:04	
Arsenic	mg/kg	<0.49	0.49	08/04/11 03:04	
Barium	mg/kg	<0.29	0.29	08/04/11 03:04	
Cadmium	mg/kg	<0.078	0.078	08/04/11 03:04	
Chromium	mg/kg	<0.49	0.49	08/04/11 03:04	
Copper	mg/kg	<0.49	0.49	08/04/11 03:04	
Iron	mg/kg	<49.0	49.0	08/04/11 03:04	
Lead	mg/kg	<0.098	0.098	08/04/11 03:04	
Manganese	mg/kg	<0.49	0.49	08/04/11 03:04	
Nickel	mg/kg	<0.49	0.49	08/04/11 03:04	
Silver	mg/kg	<0.49	0.49	08/04/11 03:04	
Zinc	mg/kg	<4.9	4.9	08/04/11 03:04	

LABORATORY CONTROL SAMPLE: 1014854

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Antimony	mg/kg	20	18.2	91	75-125	
Arsenic	mg/kg	20	18.3	92	75-125	
Barium	mg/kg	20	18.1	90	75-125	
Cadmium	mg/kg	20	18.4	92	75-125	
Chromium	mg/kg	20	18.8	94	75-125	
Copper	mg/kg	20	18.9	94	75-125	
Iron	mg/kg	250	233	93	75-125	
Lead	mg/kg	20	18.8	94	75-125	
Manganese	mg/kg	20	18.4	92	75-125	
Nickel	mg/kg	20	18.8	94	75-125	
Silver	mg/kg	20	20.4	102	75-125	
Zinc	mg/kg	20	18.8	94	75-125	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 1014855 1014856

Parameter	Units	10163483007 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Antimony	mg/kg	219	21.7	21.7	178	148	-190	-328	75-125	18	20	M6
Arsenic	mg/kg	118	21.7	21.7	202	156	386	173	75-125	26	20	D6,M6
Barium	mg/kg	49.3	21.7	21.7	115	113	302	293	75-125	2	20	M6
Cadmium	mg/kg	0.12	21.7	21.7	54.2	53.7	249	246	75-125	.9	20	M6
Chromium	mg/kg	5.4	21.7	21.7	61.4	62.0	258	260	75-125	1	20	M6

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QUALITY CONTROL DATA

Project: Black Pine Mine
Pace Project No.: 10163634

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 1014855 1014856

Parameter	Units	10163483007 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Copper	mg/kg	31.3	21.7	21.7	88.5	89.2	263	266	75-125	.8	20	M6
Iron	mg/kg	17000	272	272	15300	15900	-622	-408	75-125	4	20	M6
Lead	mg/kg	162	21.7	21.7	230	269	311	490	75-125	16	20	M6
Manganese	mg/kg	67.6	21.7	21.7	169	115	467	220	75-125	38	20	D6,M6
Nickel	mg/kg	4.9	21.7	21.7	57.6	57.7	243	243	75-125	.04	20	M6
Silver	mg/kg	13.5	21.7	21.7	39.6	38.2	120	114	75-125	3	20	
Zinc	mg/kg	18.6	21.7	21.7	76.5	80.9	266	287	75-125	6	20	M6

MATRIX SPIKE SAMPLE: 1014857

Parameter	Units	10163634007 Result	Spike Conc.	MS Result	MS % Rec	% Rec Limits	Qualifiers
Antimony	mg/kg	3.3	19.6	41.0	192	75-125	M6
Arsenic	mg/kg	14.4	19.6	69.2	279	75-125	M6
Barium	mg/kg	64.7	19.6	230	841	75-125	M6
Cadmium	mg/kg	1.6	19.6	59.5	295	75-125	M6
Chromium	mg/kg	7.6	19.6	69.5	316	75-125	M6
Copper	mg/kg	220	19.6	263	220	75-125	M6
Iron	mg/kg	11000	245	13400	1010	75-125	M6
Lead	mg/kg	24.4	19.6	96.1	365	75-125	M6
Manganese	mg/kg	419	19.6	838	2130	75-125	M6
Nickel	mg/kg	4.8	19.6	62.7	295	75-125	M6
Silver	mg/kg	<0.60	19.6	28.8	144	75-125	M6
Zinc	mg/kg	101	19.6	169	345	75-125	M6

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QUALITY CONTROL DATA

Project: Black Pine Mine
Pace Project No.: 10163634

QC Batch: MERP/5649 Analysis Method: EPA 7471
QC Batch Method: EPA 7471 Analysis Description: 7471 Mercury
Associated Lab Samples: 10163634001, 10163634002, 10163634003, 10163634004, 10163634005, 10163634006, 10163634007, 10163634008

METHOD BLANK: 1016602 Matrix: Solid
Associated Lab Samples: 10163634001, 10163634002, 10163634003, 10163634004, 10163634005, 10163634006, 10163634007, 10163634008

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Mercury	mg/kg	<0.018	0.018	08/01/11 15:23	

LABORATORY CONTROL SAMPLE: 1016603

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Mercury	mg/kg	.45	0.47	104	80-120	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 1016604 1016605

Parameter	Units	10163633001 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Mercury	mg/kg	7.0	.46	.51	5.2	5.7	-399	-259	80-120	9	20	M6

MATRIX SPIKE SAMPLE: 1016606

Parameter	Units	10163634008 Result	Spike Conc.	MS Result	MS % Rec	% Rec Limits	Qualifiers
Mercury	mg/kg	<0.021	.56	<0.022	3	80-120	M1

REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL DATA

Project: Black Pine Mine
Pace Project No.: 10163634

QC Batch: MERP/5650 Analysis Method: EPA 7471
QC Batch Method: EPA 7471 Analysis Description: 7471 Mercury
Associated Lab Samples: 10163634009, 10163634010

METHOD BLANK: 1016607 Matrix: Solid
Associated Lab Samples: 10163634009, 10163634010

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Mercury	mg/kg	<0.020	0.020	07/31/11 09:25	

LABORATORY CONTROL SAMPLE: 1016608

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Mercury	mg/kg	.44	0.45	103	80-120	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 1016609 1016610

Parameter	Units	10163634009 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Mercury	mg/kg	0.12	.45	.54	0.23	0.31	25	35	80-120	27	20	D6,M1

MATRIX SPIKE SAMPLE: 1016611

Parameter	Units	10163643009 Result	Spike Conc.	MS Result	MS % Rec	% Rec Limits	Qualifiers
Mercury	mg/kg	137	.6	137	14	80-120	M6

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QUALITY CONTROL DATA

Project: Black Pine Mine
Pace Project No.: 10163634

QC Batch: MPRP/27290 Analysis Method: % Moisture
QC Batch Method: % Moisture Analysis Description: Dry Weight/Percent Moisture
Associated Lab Samples: 10163634001, 10163634002, 10163634003, 10163634004, 10163634005

SAMPLE DUPLICATE: 1019295

Parameter	Units	10164251001 Result	Dup Result	RPD	Max RPD	Qualifiers
Percent Moisture	%	3.9	4.4	13	30	

SAMPLE DUPLICATE: 1019296

Parameter	Units	10163634005 Result	Dup Result	RPD	Max RPD	Qualifiers
Percent Moisture	%	8.6	9.4	9	30	

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QUALITY CONTROL DATA

Project: Black Pine Mine
Pace Project No.: 10163634

QC Batch: MPRP/27293 Analysis Method: % Moisture
QC Batch Method: % Moisture Analysis Description: Dry Weight/Percent Moisture
Associated Lab Samples: 10163634006, 10163634007, 10163634008, 10163634009, 10163634010

SAMPLE DUPLICATE: 1019403

Parameter	Units	10163634006 Result	Dup Result	RPD	Max RPD	Qualifiers
Percent Moisture	%	10.3	11.1	7	30	

SAMPLE DUPLICATE: 1019404

Parameter	Units	10163643008 Result	Dup Result	RPD	Max RPD	Qualifiers
Percent Moisture	%	18.6	18.3	2	30	

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QUALITY CONTROL DATA

Project: Black Pine Mine
Pace Project No.: 10163634

QC Batch: MT/6442 Analysis Method: ASA 33-3.2/EPA 353.2
QC Batch Method: ASA 33-3.2/EPA 353.2 Analysis Description: 353.2 Nitrate + Nitrite
Associated Lab Samples: 10163634006, 10163634008, 10163634010

METHOD BLANK: 1016641 Matrix: Solid
Associated Lab Samples: 10163634006, 10163634008, 10163634010

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Available Nitrate	mg/kg	<5.0	5.0	07/26/11 17:37	

LABORATORY CONTROL SAMPLE: 1016642

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Available Nitrate	mg/kg	25	24.0	96	76-124	

SAMPLE DUPLICATE: 1016643

Parameter	Units	10163246004 Result	Dup Result	RPD	Max RPD	Qualifiers
Available Nitrate	mg/kg	<5.0	<5.0		30	

SAMPLE DUPLICATE: 1016644

Parameter	Units	10163644008 Result	Dup Result	RPD	Max RPD	Qualifiers
Available Nitrate	mg/kg	<5.0	<5.0		30	

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QUALITY CONTROL DATA

Project: Black Pine Mine
Pace Project No.: 10163634

QC Batch: MT/6438 Analysis Method: ASA 29-3.5.2
QC Batch Method: ASA 29-3.5.2 Analysis Description: Organic Matter ASA 29
Associated Lab Samples: 10163634006, 10163634008, 10163634010

METHOD BLANK: 1016290 Matrix: Solid
Associated Lab Samples: 10163634006, 10163634008, 10163634010

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Organic Matter	% (w/w)	<0.10	0.10	07/21/11 16:50	

LABORATORY CONTROL SAMPLE: 1016291

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Organic Matter	% (w/w)	3.1	3.3	107	69-131	

SAMPLE DUPLICATE: 1016293

Parameter	Units	10163634008 Result	Dup Result	RPD	Max RPD	Qualifiers
Organic Matter	% (w/w)	0.13	<0.10		30	

SAMPLE DUPLICATE: 1018103

Parameter	Units	10163246002 Result	Dup Result	RPD	Max RPD	Qualifiers
Organic Matter	% (w/w)	3.3	3.2	2	30	

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QUALITY CONTROL DATA

Project: Black Pine Mine
Pace Project No.: 10163634

QC Batch: MT/6426 Analysis Method: ASA 10-3.2
QC Batch Method: ASA 10-3.2 Analysis Description: ASA 10-3.2 pH saturated paste
Associated Lab Samples: 10163634006, 10163634008, 10163634010

SAMPLE DUPLICATE: 1017424

Parameter	Units	10163246004 Result	Dup Result	RPD	Max RPD	Qualifiers
pH, Saturated Paste	Std. Units	7.0	6.9	.7	20	

SAMPLE DUPLICATE: 1017425

Parameter	Units	10163645001 Result	Dup Result	RPD	Max RPD	Qualifiers
pH, Saturated Paste	Std. Units	6.9	6.7	2	20	

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QUALITY CONTROL DATA

Project: Black Pine Mine
Pace Project No.: 10163634

QC Batch: MT/6443 Analysis Method: ASA 24-5.4/SM4500
QC Batch Method: ASA 24-5.4/SM4500 Analysis Description: SM4500P-E, Total Phosphorus
Associated Lab Samples: 10163634006, 10163634008, 10163634010

METHOD BLANK: 1016645 Matrix: Solid
Associated Lab Samples: 10163634006, 10163634008, 10163634010

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Available Phosphorus	mg/kg	<1.0	1.0	07/25/11 14:30	

LABORATORY CONTROL SAMPLE: 1016646

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Available Phosphorus	mg/kg	10	8.0	80	56-144	

SAMPLE DUPLICATE: 1016647

Parameter	Units	10163246004 Result	Dup Result	RPD	Max RPD	Qualifiers
Available Phosphorus	mg/kg	2.8	3.1	9	30	

SAMPLE DUPLICATE: 1016648

Parameter	Units	10163644006 Result	Dup Result	RPD	Max RPD	Qualifiers
Available Phosphorus	mg/kg	1.4	1.4	3	30	

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QUALITY CONTROL DATA

Project: Black Pine Mine
Pace Project No.: 10163634

QC Batch: MT/6480 Analysis Method: Modified Sobek 3.2
QC Batch Method: Modified Sobek 3.2 Analysis Description: Sobek Acid Base Potential
Associated Lab Samples: 10163634006, 10163634008, 10163634010

METHOD BLANK: 1019986 Matrix: Solid
Associated Lab Samples: 10163634006, 10163634008, 10163634010

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Neutralization Potential	tons/1000	<0.5	0.50	07/29/11 00:00	

SAMPLE DUPLICATE: 1019631

Parameter	Units	10163606002 Result	Dup Result	RPD	Max RPD	Qualifiers
Neutralization Potential	tons/1000	1.5	1.7			

SAMPLE DUPLICATE: 1019632

Parameter	Units	10163246007 Result	Dup Result	RPD	Max RPD	Qualifiers
Neutralization Potential	tons/1000	4.0	5.7			

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QUALITY CONTROL DATA

Project: Black Pine Mine
Pace Project No.: 10163634

QC Batch: MT/6497 Analysis Method: Modified Sobek 3.2
QC Batch Method: Modified Sobek 3.2 Analysis Description: Sobek Acid Base Potential
Associated Lab Samples: 10163634001, 10163634002, 10163634003, 10163634005, 10163634007, 10163634009

METHOD BLANK: 1020551 Matrix: Solid
Associated Lab Samples: 10163634001, 10163634002, 10163634003, 10163634005, 10163634007, 10163634009

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Neutralization Potential	tons/1000	<0.5	0.50	08/01/11 00:00	

SAMPLE DUPLICATE: 1020552

Parameter	Units	10163634001 Result	Dup Result	RPD	Max RPD	Qualifiers
Neutralization Potential	tons/1000	0.73	2.2			

SAMPLE DUPLICATE: 1024994

Parameter	Units	10163640008 Result	Dup Result	RPD	Max RPD	Qualifiers
Neutralization Potential	tons/1000	2.4	5.6			

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QUALITY CONTROL DATA

Project: Black Pine Mine
Pace Project No.: 10163634

QC Batch: MT/6452 Analysis Method: Modified Sobek 3.2
QC Batch Method: Modified Sobek 3.2 Analysis Description: Sobek Extractable Sulfur
Associated Lab Samples: 10163634006, 10163634008, 10163634010

METHOD BLANK: 1017262 Matrix: Solid
Associated Lab Samples: 10163634006, 10163634008, 10163634010

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Total Sulfur	% (w/w)	<0.050	0.050	07/29/11 16:11	

SAMPLE DUPLICATE: 1017264

Parameter	Units	10163606002 Result	Dup Result	RPD	Max RPD	Qualifiers
Total Sulfur	% (w/w)	0.228	0.211	8		

SAMPLE DUPLICATE: 1017265

Parameter	Units	10163246007 Result	Dup Result	RPD	Max RPD	Qualifiers
Total Sulfur	% (w/w)	<0.050	<0.050			

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QUALITY CONTROL DATA

Project: Black Pine Mine
Pace Project No.: 10163634

QC Batch: MT/6488 Analysis Method: Modified Sobek 3.2
QC Batch Method: Modified Sobek 3.2 Analysis Description: Sobek Extractable Sulfur
Associated Lab Samples: 10163634001, 10163634002, 10163634003, 10163634005, 10163634007, 10163634009

METHOD BLANK: 1019974 Matrix: Solid
Associated Lab Samples: 10163634001, 10163634002, 10163634003, 10163634005, 10163634007, 10163634009

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Total Sulfur	% (w/w)	<0.050	0.050	08/08/11 14:36	

SAMPLE DUPLICATE: 1019976

Parameter	Units	10163634001 Result	Dup Result	RPD	Max RPD	Qualifiers
Total Sulfur	% (w/w)	<0.050	<0.050			

SAMPLE DUPLICATE: 1019977

Parameter	Units	10163643005 Result	Dup Result	RPD	Max RPD	Qualifiers
Total Sulfur	% (w/w)	0.0605	0.0697	14		

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QUALITY CONTROL DATA

Project: Black Pine Mine
Pace Project No.: 10163634

QC Batch: MT/6481 Analysis Method: Modified Sobek 3.2
QC Batch Method: Modified Sobek 3.2 Analysis Description: Sobek SMP Buffer pH
Associated Lab Samples: 10163634006, 10163634008, 10163634010

LABORATORY CONTROL SAMPLE: 1019634

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
SMP Buffer pH	Std. Units		7.0			

SAMPLE DUPLICATE: 1019635

Parameter	Units	10163606002 Result	Dup Result	RPD	Max RPD	Qualifiers
SMP Buffer pH	Std. Units	6.6	6.6	0	20	

SAMPLE DUPLICATE: 1019636

Parameter	Units	10163246007 Result	Dup Result	RPD	Max RPD	Qualifiers
SMP Buffer pH	Std. Units	6.8	6.8	.7	20	

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QUALITY CONTROL DATA

Project: Black Pine Mine
Pace Project No.: 10163634

QC Batch: MT/6543 Analysis Method: Modified Sobek 3.2
QC Batch Method: Modified Sobek 3.2 Analysis Description: Sobek SMP Buffer pH
Associated Lab Samples: 10163634001, 10163634002, 10163634003, 10163634005, 10163634007, 10163634009

SAMPLE DUPLICATE: 1022818

Parameter	Units	10163634001 Result	Dup Result	RPD	Max RPD	Qualifiers
SMP Buffer pH	Std. Units	7.3	7.2	.3	20	

SAMPLE DUPLICATE: 1026468

Parameter	Units	10163643005 Result	Dup Result	RPD	Max RPD	Qualifiers
SMP Buffer pH	Std. Units	7.1	7.1	.3	20	

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QUALITY CONTROL DATA

Project: Black Pine Mine
Pace Project No.: 10163634

QC Batch: MT/6547 — Analysis Method: ASA 10-3.3
QC Batch Method: ASA 10-3.3 — Analysis Description: ASA 10-3.3 Specific Conductance
Associated Lab Samples: 10163634010

METHOD BLANK: 1022940 — Matrix: Water
Associated Lab Samples: 10163634010

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Sp.Conductance Saturated Paste	mmhos/cm	<0.010	0.010	07/27/11 12:56	

LABORATORY CONTROL SAMPLE: 1022941

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Sp.Conductance Saturated Paste	mmhos/cm	.85	0.80	94	53-147	

SAMPLE DUPLICATE: 1022942

Parameter	Units	10163246004 Result	Dup Result	RPD	Max RPD	Qualifiers
Sp.Conductance Saturated Paste	mmhos/cm	0.091	0.088	3	20	

SAMPLE DUPLICATE: 1022943

Parameter	Units	10163645001 Result	Dup Result	RPD	Max RPD	Qualifiers
Sp.Conductance Saturated Paste	mmhos/cm	0.20	0.14	33	20	D6

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(406)254-7226

QUALITY CONTROL DATA

Project: Black Pine Mine
Pace Project No.: 10163634

QC Batch: MT/6575 Analysis Method: ASA 10-3.3
QC Batch Method: ASA 10-3.3 Analysis Description: ASA 10-3.3 Specific Conductance
Associated Lab Samples: 10163634006, 10163634008

METHOD BLANK: 1025145 Matrix: Water
Associated Lab Samples: 10163634006, 10163634008

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Sp.Conductance Saturated Paste	mmhos/cm	<0.010	0.010	08/03/11 19:49	

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QUALIFIERS

Project: Black Pine Mine
Pace Project No.: 10163634

DEFINITIONS

DF - Dilution Factor, if reported, represents the factor applied to the reported data due to changes in sample preparation, dilution of the sample aliquot, or moisture content.

ND - Not Detected at or above adjusted reporting limit.

J - Estimated concentration above the adjusted method detection limit and below the adjusted reporting limit.

MDL - Adjusted Method Detection Limit.

S - Surrogate

1,2-Diphenylhydrazine (8270 listed analyte) decomposes to Azobenzene.

Consistent with EPA guidelines, unrounded data are displayed and have been used to calculate % recovery and RPD values.

LCS(D) - Laboratory Control Sample (Duplicate)

MS(D) - Matrix Spike (Duplicate)

DUP - Sample Duplicate

RPD - Relative Percent Difference

NC - Not Calculable.

SG - Silica Gel - Clean-Up

U - Indicates the compound was analyzed for, but not detected.

N-Nitrosodiphenylamine decomposes and cannot be separated from Diphenylamine using Method 8270. The result reported for each analyte is a combined concentration.

LABORATORIES

PASI-K	Pace Analytical Services - Kansas City
PASI-M	Pace Analytical Services - Minneapolis
PASI-MT	Pace Analytical Services - Montana

ANALYTE QUALIFIERS

D6	The relative percent difference (RPD) between the sample and sample duplicate exceeded laboratory control limits.
M1	Matrix spike recovery exceeded QC limits. Batch accepted based on laboratory control sample (LCS) recovery.
M6	Matrix spike and Matrix spike duplicate recovery not evaluated against control limits due to sample dilution.

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QUALITY CONTROL DATA CROSS REFERENCE TABLE

Project: Black Pine Mine
Pace Project No.: 10163634

Lab ID	Sample ID	QC Batch Method	QC Batch	Analytical Method	Analytical Batch
10163634006	**BP-CMN-SS-07-06**	ASA 13-3.5.2.2	MPRP/27469	CLPICPAES	ICP/11638
10163634008	**BP-CMN-SS-08-03**	ASA 13-3.5.2.2	MPRP/27469	CLPICPAES	ICP/11638
10163634010	**BP-CMN-SS-09-04**	ASA 13-3.5.2.2	MPRP/27469	CLPICPAES	ICP/11638
10163634006	**BP-CMN-SS-07-06**	EPA 9081	ICP/14917	EPA 9081	ICP/13002
10163634008	**BP-CMN-SS-08-03**	EPA 9081	ICP/14917	EPA 9081	ICP/13002
10163634010	**BP-CMN-SS-09-04**	EPA 9081	ICP/14917	EPA 9081	ICP/13002
10163634001	**BP-CMN-SS-04-00**	EPA 3050	MPRP/27167	EPA 6020	ICPM/11153
10163634002	**BP-CMN-RS-04-02**	EPA 3050	MPRP/27167	EPA 6020	ICPM/11153
10163634003	**BP-CMN-RS-04-05**	EPA 3050	MPRP/27167	EPA 6020	ICPM/11153
10163634004	**BP-CMN-SS-04-08**	EPA 3050	MPRP/27167	EPA 6020	ICPM/11153
10163634005	**BP-CMN-SS-07-00**	EPA 3050	MPRP/27167	EPA 6020	ICPM/11153
10163634006	**BP-CMN-SS-07-06**	EPA 3050	MPRP/27167	EPA 6020	ICPM/11153
10163634007	**BP-CMN-SS-08-00**	EPA 3050	MPRP/27167	EPA 6020	ICPM/11153
10163634008	**BP-CMN-SS-08-03**	EPA 3050	MPRP/27167	EPA 6020	ICPM/11153
10163634009	**BP-CMN-SS-09-00**	EPA 3050	MPRP/27167	EPA 6020	ICPM/11153
10163634010	**BP-CMN-SS-09-04**	EPA 3050	MPRP/27167	EPA 6020	ICPM/11153
10163634001	**BP-CMN-SS-04-00**	EPA 7471	MERP/5649	EPA 7471	MERC/6495
10163634002	**BP-CMN-RS-04-02**	EPA 7471	MERP/5649	EPA 7471	MERC/6495
10163634003	**BP-CMN-RS-04-05**	EPA 7471	MERP/5649	EPA 7471	MERC/6495
10163634004	**BP-CMN-SS-04-08**	EPA 7471	MERP/5649	EPA 7471	MERC/6495
10163634005	**BP-CMN-SS-07-00**	EPA 7471	MERP/5649	EPA 7471	MERC/6495
10163634006	**BP-CMN-SS-07-06**	EPA 7471	MERP/5649	EPA 7471	MERC/6495
10163634007	**BP-CMN-SS-08-00**	EPA 7471	MERP/5649	EPA 7471	MERC/6495
10163634008	**BP-CMN-SS-08-03**	EPA 7471	MERP/5649	EPA 7471	MERC/6495
10163634009	**BP-CMN-SS-09-00**	EPA 7471	MERP/5650	EPA 7471	MERC/6493
10163634010	**BP-CMN-SS-09-04**	EPA 7471	MERP/5650	EPA 7471	MERC/6493
10163634001	**BP-CMN-SS-04-00**	% Moisture	MPRP/27290		
10163634002	**BP-CMN-RS-04-02**	% Moisture	MPRP/27290		
10163634003	**BP-CMN-RS-04-05**	% Moisture	MPRP/27290		
10163634004	**BP-CMN-SS-04-08**	% Moisture	MPRP/27290		
10163634005	**BP-CMN-SS-07-00**	% Moisture	MPRP/27290		
10163634006	**BP-CMN-SS-07-06**	% Moisture	MPRP/27293		
10163634007	**BP-CMN-SS-08-00**	% Moisture	MPRP/27293		
10163634008	**BP-CMN-SS-08-03**	% Moisture	MPRP/27293		
10163634009	**BP-CMN-SS-09-00**	% Moisture	MPRP/27293		
10163634010	**BP-CMN-SS-09-04**	% Moisture	MPRP/27293		
10163634006	**BP-CMN-SS-07-06**	ASA 33-3.2/EPA 353.2	MT/6442		
10163634008	**BP-CMN-SS-08-03**	ASA 33-3.2/EPA 353.2	MT/6442		
10163634010	**BP-CMN-SS-09-04**	ASA 33-3.2/EPA 353.2	MT/6442		
10163634006	**BP-CMN-SS-07-06**	ASTM D421	MT/6412		
10163634008	**BP-CMN-SS-08-03**	ASTM D421	MT/6412		
10163634010	**BP-CMN-SS-09-04**	ASTM D421	MT/6412		
10163634006	**BP-CMN-SS-07-06**	ASA 29-3.5.2	MT/6438		
10163634008	**BP-CMN-SS-08-03**	ASA 29-3.5.2	MT/6438		

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QUALITY CONTROL DATA CROSS REFERENCE TABLE

Project: Black Pine Mine
Pace Project No.: 10163634

Lab ID	Sample ID	QC Batch Method	QC Batch	Analytical Method	Analytical Batch
10163634010	**BP-CMN-SS-09-04**	ASA 29-3.5.2	MT/6438		
10163634006	**BP-CMN-SS-07-06**	ASA 10-3.2	MT/6426		
10163634008	**BP-CMN-SS-08-03**	ASA 10-3.2	MT/6426		
10163634010	**BP-CMN-SS-09-04**	ASA 10-3.2	MT/6426		
10163634006	**BP-CMN-SS-07-06**	ASA 24-5.4/SM4500	MT/6443		
10163634008	**BP-CMN-SS-08-03**	ASA 24-5.4/SM4500	MT/6443		
10163634010	**BP-CMN-SS-09-04**	ASA 24-5.4/SM4500	MT/6443		
10163634001	**BP-CMN-SS-04-00**	Modified Sobek 3.2	MT/6497		
10163634002	**BP-CMN-RS-04-02**	Modified Sobek 3.2	MT/6497		
10163634003	**BP-CMN-RS-04-05**	Modified Sobek 3.2	MT/6497		
10163634005	**BP-CMN-SS-07-00**	Modified Sobek 3.2	MT/6497		
10163634006	**BP-CMN-SS-07-06**	Modified Sobek 3.2	MT/6480		
10163634007	**BP-CMN-SS-08-00**	Modified Sobek 3.2	MT/6497		
10163634008	**BP-CMN-SS-08-03**	Modified Sobek 3.2	MT/6480		
10163634009	**BP-CMN-SS-09-00**	Modified Sobek 3.2	MT/6497		
10163634010	**BP-CMN-SS-09-04**	Modified Sobek 3.2	MT/6480		
10163634001	**BP-CMN-SS-04-00**	Modified Sobek 3.2	MT/6488		
10163634002	**BP-CMN-RS-04-02**	Modified Sobek 3.2	MT/6488		
10163634003	**BP-CMN-RS-04-05**	Modified Sobek 3.2	MT/6488		
10163634005	**BP-CMN-SS-07-00**	Modified Sobek 3.2	MT/6488		
10163634006	**BP-CMN-SS-07-06**	Modified Sobek 3.2	MT/6452		
10163634007	**BP-CMN-SS-08-00**	Modified Sobek 3.2	MT/6488		
10163634008	**BP-CMN-SS-08-03**	Modified Sobek 3.2	MT/6452		
10163634009	**BP-CMN-SS-09-00**	Modified Sobek 3.2	MT/6488		
10163634010	**BP-CMN-SS-09-04**	Modified Sobek 3.2	MT/6452		
10163634001	**BP-CMN-SS-04-00**	Modified Sobek 3.2	MT/6501		
10163634002	**BP-CMN-RS-04-02**	Modified Sobek 3.2	MT/6501		
10163634003	**BP-CMN-RS-04-05**	Modified Sobek 3.2	MT/6501		
10163634005	**BP-CMN-SS-07-00**	Modified Sobek 3.2	MT/6501		
10163634006	**BP-CMN-SS-07-06**	Modified Sobek 3.2	MT/6499		
10163634007	**BP-CMN-SS-08-00**	Modified Sobek 3.2	MT/6501		
10163634008	**BP-CMN-SS-08-03**	Modified Sobek 3.2	MT/6499		
10163634009	**BP-CMN-SS-09-00**	Modified Sobek 3.2	MT/6501		
10163634010	**BP-CMN-SS-09-04**	Modified Sobek 3.2	MT/6499		
10163634001	**BP-CMN-SS-04-00**	Modified Sobek 3.2	MT/6543		
10163634002	**BP-CMN-RS-04-02**	Modified Sobek 3.2	MT/6543		
10163634003	**BP-CMN-RS-04-05**	Modified Sobek 3.2	MT/6543		
10163634005	**BP-CMN-SS-07-00**	Modified Sobek 3.2	MT/6543		

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QUALITY CONTROL DATA CROSS REFERENCE TABLE

Project: Black Pine Mine
Pace Project No.: 10163634

Lab ID	Sample ID	QC Batch Method	QC Batch	Analytical Method	Analytical Batch
10163634006	**BP-CMN-SS-07-06**	Modified Sobek 3.2	MT/6481		
10163634007	**BP-CMN-SS-08-00**	Modified Sobek 3.2	MT/6543		
10163634008	**BP-CMN-SS-08-03**	Modified Sobek 3.2	MT/6481		
10163634009	**BP-CMN-SS-09-00**	Modified Sobek 3.2	MT/6543		
10163634010	**BP-CMN-SS-09-04**	Modified Sobek 3.2	MT/6481		
10163634006	**BP-CMN-SS-07-06**	ASA 10-3.3	MT/6575		
10163634008	**BP-CMN-SS-08-03**	ASA 10-3.3	MT/6575		
10163634010	**BP-CMN-SS-09-04**	ASA 10-3.3	MT/6547		

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CHAIN-OF-CUSTODY / Analytical Request Document

The Chain-of-Custody is a LEGAL DOCUMENT. All relevant fields must be completed accurately.

Page: 1 of 1

1429998

Section A Required Client Information:

Company: Herrera	
Address:	
Email To:	
Phone:	Fax:
Requested Due Date/TAT:	

Section B Required Project Information:

Report To:	Raven Houck
Copy To:	Mark Donner
Purchase Order No.:	
Project Name:	Black Pine Mine
Project Number:	

Section C Invoice Information:

Attention:	
Company Name:	DEQ
Address:	
Pace Quote Reference:	
Pace Project Manager:	
Pace Profile #:	

REGULATORY AGENCY

☐ NPDES ☐ GROUND WATER ☐ DRINKING WATER
☐ UST ☐ RCRA ☐ OTHER _____

Site Location STATE: _____

Section D Required Client Information

SAMPLE ID (A-Z, 0-9 / ,-) Sample IDs MUST BE UNIQUE

Matrix Codes MATRIX / CODE

Drinking Water	DW
Water	WT
Waste Water	WW
Product	P
Soil/Solid	SL
Oil	OL
Wipe	WP
Air	AR
Tissue	TS
Other	OT

Requested Analysis Filtered (Y/N)

ITEM #	SAMPLE ID	MATRIX CODE (see valid codes to left)	SAMPLE TYPE (G=GRAB C=COMP)	COLLECTED COMPOSITE START DATE	COLLECTED COMPOSITE START TIME	COLLECTED COMPOSITE END/GRAB DATE	COLLECTED COMPOSITE END/GRAB TIME	SAMPLE TEMP AT COLLECTION	# OF CONTAINERS	Preservatives: Unpreserved	H_2SO_4	HNO_3	HCl	NaOH	$Na_2S_2O_3$	Methanol	Other	Y/N	Analysis Test ↓: Total Recoverable Metals	ABA	Moisture Content	Agriculture	Residual Chlorine (Y/N)	Pace Project No./ Lab I.D.
1	BP-CMN-SS-04-00	SL	C	7/14/11	1245	"	"		2	X									X	X	X			001
2	BP-CMN-RS-04-02	SL	C	7/14/11	1235				2	X									X	X	X			002
3	BP-CMN-RS-04-05	SL	C	7/14/11	1240				2	X									X	X	X			003
4	BP-CMN-SS-04-08	SL	G	7/14/11	1230				1	X									X	X	X			004
5	BP-CMN-SS-07-00	SL	G	7/14/11	1335				2	X									X	X				005
6	BP-CMN-SS-07-06	SL	G	7/14/11	1340				2	X									X		X			006
7	BP-CMN-SS-08-00	SL	G	7/14/11	1405				2	X									X	X				007
8	BP-CMN-SS-08-03	SL	G	7/14/11	1410				2	X									X		X			008
9	BP-CMN-SS-09-00	SL	G	7/14/11	1430				2	X									X	X				009
10	BP-CMN-SS-09-04	SL	G	7/14/11	1435				2	X									X		X			010
11																								
12																								

ADDITIONAL COMMENTS	RELINQUISHED BY / AFFILIATION	DATE	TIME	ACCEPTED BY / AFFILIATION	DATE	TIME	SAMPLE CONDITIONS
	D Cates/Herrera	7/14/11	1540	Blake Noe	7/14/11	3:43	
	Blake	7/14/11	9:00	Norma C Trimble/Pace	7/14/11	2100	
							3.6 / Y / N / Y

Temp In °C | Received on Ice (Y/N) | Custody Sealed Cooler (Y/N) | Samples Intact (Y/N)

ORIGINAL

SAMPLER NAME AND SIGNATURE

PRINT Name of SAMPLER:

SIGNATURE of SAMPLER: | DATE Signed (MM/DD/YY):

*Important Note: By signing this form you are accepting Pace's NET 30 day payment terms and agreeing to late charges of 1.5% per month for any invoices not paid within 30 days.

F-ALL-Q-020rev.07, 15-May-2007

Sample Condition Upon Receipt

Pace Analytical

Client Name: Herrera Project # 10163634

Courier: ☐ Fed Ex ☐ UPS ☐ USPS ☐ Client ☐ Commercial ☒ Pace Other _____

Tracking #: BN Dropped off

Custody Seal on Cooler/Box Present: ☐ yes ☒ no Seals intact: ☐ yes ☒ no

Packing Material: ☑ Bubble Wrap ☐ Bubble Bags ☐ None ☐ Other _____ Temp Blank: Yes ✓ No _____

Thermometer Used: 1383045 or 135 Type of Ice: (Wet) Blue None ☒ Samples on ice, cooling process has begun

Cooler Temperature: 3.6 ° Biological Tissue is Frozen: Yes (No)

Temp should be above freezing to 6°C

Date and Initials of person examining contents: BN 7/16/11

Comments:

Chain of Custody Present:	☑Yes ☐No ☐N/A	1.
Chain of Custody Filled Out:	☑Yes ☐No ☐N/A	2.
Chain of Custody Relinquished:	☑Yes ☐No ☐N/A	3.
Sampler Name & Signature on COC:	☐Yes ☑No ☐N/A	4.
Samples Arrived within Hold Time:	☑Yes ☐No ☐N/A	5.
Short Hold Time Analysis (<72hr):	☐Yes ☐No ☑N/A	6.
Rush Turn Around Time Requested:	☐Yes ☐No ☑N/A	7.
Sufficient Volume:	☑Yes ☐No ☐N/A	8.
Correct Containers Used:	☑Yes ☐No ☐N/A	9. PB
-Pace Containers Used:	☑Yes ☐No ☐N/A	
Containers Intact:	☑Yes ☐No ☐N/A	10.
Filtered volume received for Dissolved tests	☐Yes ☐No ☑N/A	11.
Sample Labels match COC:	☑Yes ☐No ☐N/A	12.
-Includes date/time/ID/Analysis Matrix: SL		
All containers needing acid/base preservation have been checked. Noncompliance are noted in 13.	☐Yes ☐No ☑N/A	13. ☐ HNO3 ☐ H2SO4 ☐ NaOH ☐ HCl Samp #
All containers needing preservation are found to be in compliance with EPA recommendation.	☐Yes ☐No ☑N/A	
Exceptions: VOA,Coliform, TOC, Oil and Grease, WI-DRO (water)	☐Yes ☑No NP	Initial when completed / Lot # of added preservative
Samples checked for dechlorination:	☐Yes ☐No ☑N/A	14.
Headspace in VOA Vials (>6mm):	☐Yes ☐No ☑N/A	15.
Trip Blank Present:	☐Yes ☐No ☑N/A	16.
Trip Blank Custody Seals Present	☐Yes ☐No ☑N/A	
Pace Trip Blank Lot # (if purchased): N A		

Client Notification/ Resolution: Field Data Required? Y / N

Person Contacted: _____ Date/Time: _____

Comments/ Resolution: _____

Project Manager Review: Sally Kugler **Date:** 7/16/11

Note: Whenever there is a discrepancy affecting North Carolina compliance samples, a copy of this form will be sent to the North Carolina DEHNR Certification Office (i.e out of hold, incorrect preservative, out of temp, incorrect containers)

Pace Analytical Services, Inc.
602 S 25th Street
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(406)254-7226

August 09, 2011

Kevin Houck
Herrera Environmental Consultants
101 East Broadway, Suite 610
Missoula, MT 59802

RE: Project: Black Pine Mine
Pace Project No.: 10163635

Dear Kevin Houck:
Enclosed are the analytical results for sample(s) received by the laboratory on July 14, 2011. The results relate only to the samples included in this report.

If you have any questions concerning this report, please feel free to contact me.

Sincerely,

Sally Heinje

sally.heinje@pacelabs.com
Project Manager

Enclosures

cc: Devin Clary, Montana Dept. of Environmental Quality
Mark Donner, Trihydro

REPORT OF LABORATORY ANALYSIS

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CERTIFICATIONS

Project: Black Pine Mine
Pace Project No.: 10163635

Minnesota Certification IDs

1700 Elm Street SE Suite 200, Minneapolis, MN 55414
A2LA Certification #: 2926.01
Alaska Certification #: UST-078
Alaska Certification #MN00064
Arizona Certification #: AZ-0014
Arkansas Certification #: 88-0680
California Certification #: 01155CA
EPA Region 8 Certification #: Pace
Florida/NELAP Certification #: E87605
Georgia Certification #: 959
Idaho Certification #: MN00064
Illinois Certification #: 200011
Iowa Certification #: 368
Kansas Certification #: E-10167
Louisiana Certification #: 03086
Louisiana Certification #: LA080009
Maine Certification #: 2007029
Maryland Certification #: 322
Michigan DEQ Certification #: 9909
Minnesota Certification #: 027-053-137
Mississippi Certification #: Pace
Montana Certification #: MT CERT0092
Nebraska Certification #: Pace
Nevada Certification #: MN_00064
New Jersey Certification #: MN-002
New Mexico Certification #: Pace
New York Certification #: 11647
North Carolina Certification #: 530
North Dakota Certification #: R-036
North Dakota Certification #: R-036A
Ohio VAP Certification #: CL101
Oklahoma Certification #: D9921
Oklahoma Certification #: 9507
Oregon Certification #: MN200001
Pennsylvania Certification #: 68-00563
Puerto Rico Certification
Tennessee Certification #: 02818
Texas Certification #: T104704192
Washington Certification #: C754
Wisconsin Certification #: 999407970

Montana Certification IDs

602 South 25th Street, Billings, MT 59101
EPA Region 8 Certification #: 8TMS-Q
Idaho Certification #: MT00012
Montana Certification #: MT CERT0040
NVLAP Certification #: 101292-0
Minnesota Dept of Health Certification #: 030-999-442

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SAMPLE SUMMARY

Project: Black Pine Mine
Pace Project No.: 10163635

Lab ID	Sample ID	Matrix	Date Collected	Date Received
10163635001	**CMN-SS-15**	Solid	07/13/11 13:45	07/14/11 21:00
10163635002	**CMN-SS-16**	Solid	07/13/11 13:55	07/14/11 21:00
10163635003	**HM-SS-10**	Solid	07/13/11 14:25	07/14/11 21:00
10163635004	**HM-SS-09**	Solid	07/13/11 14:40	07/14/11 21:00
10163635005	**HM-SS-12**	Solid	07/13/11 15:00	07/14/11 21:00
10163635006	**HM-SS-11**	Solid	07/13/11 15:10	07/14/11 21:00
10163635007	**HM-SS-13**	Solid	07/14/11 08:45	07/14/11 21:00
10163635008	**HM-SS-14**	Solid	07/14/11 08:15	07/14/11 21:00
10163635009	**HM-SS-16**	Solid	07/14/11 10:35	07/14/11 21:00

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SAMPLE ANALYTE COUNT

Project: Black Pine Mine
Pace Project No.: 10163635

Lab ID	Sample ID	Method	Analysts	Analytes Reported	Laboratory
10163635001	**CMN-SS-15**	EPA 6020	CJS	12	PASI-M
		EPA 7471	TEM	1	PASI-M
		% Moisture	JDL	1	PASI-M
10163635002	**CMN-SS-16**	EPA 6020	CJS	12	PASI-M
		EPA 7471	TEM	1	PASI-M
		% Moisture	JDL	1	PASI-M
10163635003	**HM-SS-10**	EPA 6020	CJS	12	PASI-M
		EPA 7471	TEM	1	PASI-M
		% Moisture	JDL	1	PASI-M
		Modified Sobek 3.2	JH1	1	PASI-MT
		Modified Sobek 3.2	JH1	5	PASI-MT
		Modified Sobek 3.2	JH1	4	PASI-MT
		Modified Sobek 3.2	JH1	1	PASI-MT
10163635004	**HM-SS-09**	EPA 6020	CJS	12	PASI-M
		EPA 7471	TEM	1	PASI-M
		% Moisture	JDL	1	PASI-M
		Modified Sobek 3.2	JH1	1	PASI-MT
		Modified Sobek 3.2	JH1	5	PASI-MT
		Modified Sobek 3.2	JH1	4	PASI-MT
		Modified Sobek 3.2	JH1	1	PASI-MT
10163635005	**HM-SS-12**	EPA 6020	CJS	12	PASI-M
		EPA 7471	TEM	1	PASI-M
		% Moisture	JDL	1	PASI-M
		Modified Sobek 3.2	JH1	1	PASI-MT
		Modified Sobek 3.2	JH1	5	PASI-MT
		Modified Sobek 3.2	JH1	4	PASI-MT
		Modified Sobek 3.2	JH1	1	PASI-MT
10163635006	**HM-SS-11**	EPA 6020	CJS	12	PASI-M
		EPA 7471	TEM	1	PASI-M
		% Moisture	JDL	1	PASI-M
		Modified Sobek 3.2	JH1	1	PASI-MT
		Modified Sobek 3.2	SA1	5	PASI-MT
		Modified Sobek 3.2	JH1	4	PASI-MT
		Modified Sobek 3.2	JH1	1	PASI-MT
10163635007	**HM-SS-13**	EPA 6020	CJS	12	PASI-M
		EPA 7471	TEM	1	PASI-M
		% Moisture	JDL	1	PASI-M

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SAMPLE ANALYTE COUNT

Project: Black Pine Mine
Pace Project No.: 10163635

Lab ID	Sample ID	Method	Analysts	Analytes Reported	Laboratory
		Modified Sobek 3.2	JH1	1	PASI-MT
		Modified Sobek 3.2	SA1	5	PASI-MT
		Modified Sobek 3.2	JH1	4	PASI-MT
		Modified Sobek 3.2	JH1	1	PASI-MT
10163635008	**HM-SS-14**	EPA 6020	CJS	12	PASI-M
		EPA 7471	TEM	1	PASI-M
		% Moisture	JDL	1	PASI-M
		Modified Sobek 3.2	JH1	1	PASI-MT
		Modified Sobek 3.2	JH1	5	PASI-MT
		Modified Sobek 3.2	JH1	4	PASI-MT
		Modified Sobek 3.2	JH1	1	PASI-MT
10163635009	**HM-SS-16**	EPA 6020	CJS	12	PASI-M
		EPA 7471	TEM	1	PASI-M
		% Moisture	JDL	1	PASI-M
		Modified Sobek 3.2	JH1	1	PASI-MT
		Modified Sobek 3.2	SA1	5	PASI-MT
		Modified Sobek 3.2	JH1	4	PASI-MT
		Modified Sobek 3.2	JH1	1	PASI-MT

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PROJECT NARRATIVE

Project: Black Pine Mine
Pace Project No.: 10163635

Method: **EPA 6020**
Description: 6020 MET ICPMS
Client: Montana Dept. of Environmental Quality
Date: August 09, 2011

General Information:
9 samples were analyzed for EPA 6020. All samples were received in acceptable condition with any exceptions noted below.

Hold Time:
The samples were analyzed within the method required hold times with any exceptions noted below.

Sample Preparation:
The samples were prepared in accordance with EPA 3050 with any exceptions noted below.

Initial Calibrations (including MS Tune as applicable):
All criteria were within method requirements with any exceptions noted below.

Continuing Calibration:
All criteria were within method requirements with any exceptions noted below.

Internal Standards:
All internal standards were within QC limits with any exceptions noted below.

Method Blank:
All analytes were below the report limit in the method blank with any exceptions noted below.

QC Batch: MPRP/27162

P8: Analyte was detected in the method blank. All associated samples had concentrations of at least ten times greater than the blank or were below the reporting limit.

- BLANK (Lab ID: 1014828)
  - Lead

Laboratory Control Spike:
All laboratory control spike compounds were within QC limits with any exceptions noted below.

Matrix Spikes:
All percent recoveries and relative percent differences (RPDs) were within acceptance criteria with any exceptions noted below.

QC Batch: MPRP/27162

A matrix spike and matrix spike duplicate (MS/MSD) were performed on the following sample(s): 10163635001,258469017

M6: Matrix spike and Matrix spike duplicate recovery not evaluated against control limits due to sample dilution.

- MS (Lab ID: 1014830)
  - Barium
  - Copper
  - Iron
  - Lead
  - Manganese
  - Zinc
- MS (Lab ID: 1014832)

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PROJECT NARRATIVE

Project: Black Pine Mine
Pace Project No.: 10163635

Method: **EPA 6020**
Description: 6020 MET ICPMS
Client: Montana Dept. of Environmental Quality
Date: August 09, 2011

QC Batch: MPRP/27162

A matrix spike and matrix spike duplicate (MS/MSD) were performed on the following sample(s): 10163635001,258469017

M6: Matrix spike and Matrix spike duplicate recovery not evaluated against control limits due to sample dilution.

- Antimony
- Arsenic
- Copper
- Iron
- Manganese
- Zinc

• MSD (Lab ID: 1014831)

- Barium
- Copper
- Iron
- Lead
- Manganese
- Zinc

Duplicate Sample:
All duplicate sample results were within method acceptance criteria with any exceptions noted below.

Additional Comments:

Analyte Comments:

QC Batch: MPRP/27162

P8: Analyte was detected in the method blank. All associated samples had concentrations of at least ten times greater than the blank or were below the reporting limit.

• BLANK (Lab ID: 1014828)

- Lead

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PROJECT NARRATIVE

Project: Black Pine Mine
Pace Project No.: 10163635

Method: **EPA 7471**
Description: 7471 Mercury
Client: Montana Dept. of Environmental Quality
Date: August 09, 2011

General Information:
9 samples were analyzed for EPA 7471. All samples were received in acceptable condition with any exceptions noted below.

Hold Time:
The samples were analyzed within the method required hold times with any exceptions noted below.

Sample Preparation:
The samples were prepared in accordance with EPA 7471 with any exceptions noted below.

Initial Calibrations (including MS Tune as applicable):
All criteria were within method requirements with any exceptions noted below.

Continuing Calibration:
All criteria were within method requirements with any exceptions noted below.

Method Blank:
All analytes were below the report limit in the method blank with any exceptions noted below.

Laboratory Control Spike:
All laboratory control spike compounds were within QC limits with any exceptions noted below.

Matrix Spikes:
All percent recoveries and relative percent differences (RPDs) were within acceptance criteria with any exceptions noted below.

QC Batch: MERP/5648

A matrix spike and matrix spike duplicate (MS/MSD) were performed on the following sample(s): 10163606001,10163635009

M1: Matrix spike recovery exceeded QC limits. Batch accepted based on laboratory control sample (LCS) recovery.

- MS (Lab ID: 1016597)
  - Mercury
- MSD (Lab ID: 1016598)
  - Mercury

M6: Matrix spike and Matrix spike duplicate recovery not evaluated against control limits due to sample dilution.

- MS (Lab ID: 1016599)
  - Mercury

Duplicate Sample:
All duplicate sample results were within method acceptance criteria with any exceptions noted below.

Additional Comments:

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PROJECT NARRATIVE

Project: Black Pine Mine
Pace Project No.: 10163635

Method: **Modified Sobek 3.2**
Description: Sobek Acid Base Potential
Client: Montana Dept. of Environmental Quality
Date: August 09, 2011

General Information:
7 samples were analyzed for Modified Sobek 3.2. All samples were received in acceptable condition with any exceptions noted below.

Hold Time:
The samples were analyzed within the method required hold times with any exceptions noted below.

Initial Calibrations (including MS Tune as applicable):
All criteria were within method requirements with any exceptions noted below.

Continuing Calibration:
All criteria were within method requirements with any exceptions noted below.

Internal Standards:
All internal standards were within QC limits with any exceptions noted below.

Surrogates:
All surrogates were within QC limits with any exceptions noted below.

Method Blank:
All analytes were below the report limit in the method blank with any exceptions noted below.

Laboratory Control Spike:
All laboratory control spike compounds were within QC limits with any exceptions noted below.

Matrix Spikes:
All percent recoveries and relative percent differences (RPDs) were within acceptance criteria with any exceptions noted below.

Duplicate Sample:
All duplicate sample results were within method acceptance criteria with any exceptions noted below.

Additional Comments:

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PROJECT NARRATIVE

Project: Black Pine Mine
Pace Project No.: 10163635

Method: **Modified Sobek 3.2**
Description: Sobek Extractable Sulfur
Client: Montana Dept. of Environmental Quality
Date: August 09, 2011

General Information:
7 samples were analyzed for Modified Sobek 3.2. All samples were received in acceptable condition with any exceptions noted below.

Hold Time:
The samples were analyzed within the method required hold times with any exceptions noted below.

Initial Calibrations (including MS Tune as applicable):
All criteria were within method requirements with any exceptions noted below.

Continuing Calibration:
All criteria were within method requirements with any exceptions noted below.

Internal Standards:
All internal standards were within QC limits with any exceptions noted below.

Surrogates:
All surrogates were within QC limits with any exceptions noted below.

Method Blank:
All analytes were below the report limit in the method blank with any exceptions noted below.

Laboratory Control Spike:
All laboratory control spike compounds were within QC limits with any exceptions noted below.

Matrix Spikes:
All percent recoveries and relative percent differences (RPDs) were within acceptance criteria with any exceptions noted below.

Duplicate Sample:
All duplicate sample results were within method acceptance criteria with any exceptions noted below.

Additional Comments:

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PROJECT NARRATIVE

Project: Black Pine Mine
Pace Project No.: 10163635

Method: **Modified Sobek 3.2**
Description: Sobek Calculations
Client: Montana Dept. of Environmental Quality
Date: August 09, 2011

General Information:
7 samples were analyzed for Modified Sobek 3.2. All samples were received in acceptable condition with any exceptions noted below.

Hold Time:
The samples were analyzed within the method required hold times with any exceptions noted below.

Initial Calibrations (including MS Tune as applicable):
All criteria were within method requirements with any exceptions noted below.

Continuing Calibration:
All criteria were within method requirements with any exceptions noted below.

Internal Standards:
All internal standards were within QC limits with any exceptions noted below.

Surrogates:
All surrogates were within QC limits with any exceptions noted below.

Method Blank:
All analytes were below the report limit in the method blank with any exceptions noted below.

Laboratory Control Spike:
All laboratory control spike compounds were within QC limits with any exceptions noted below.

Matrix Spikes:
All percent recoveries and relative percent differences (RPDs) were within acceptance criteria with any exceptions noted below.

Duplicate Sample:
All duplicate sample results were within method acceptance criteria with any exceptions noted below.

Additional Comments:

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PROJECT NARRATIVE

Project: Black Pine Mine
Pace Project No.: 10163635

Method: **Modified Sobek 3.2**
Description: Sobek SMP Buffer pH
Client: Montana Dept. of Environmental Quality
Date: August 09, 2011

General Information:
7 samples were analyzed for Modified Sobek 3.2. All samples were received in acceptable condition with any exceptions noted below.

Hold Time:
The samples were analyzed within the method required hold times with any exceptions noted below.

Initial Calibrations (including MS Tune as applicable):
All criteria were within method requirements with any exceptions noted below.

Continuing Calibration:
All criteria were within method requirements with any exceptions noted below.

Internal Standards:
All internal standards were within QC limits with any exceptions noted below.

Surrogates:
All surrogates were within QC limits with any exceptions noted below.

Method Blank:
All analytes were below the report limit in the method blank with any exceptions noted below.

Laboratory Control Spike:
All laboratory control spike compounds were within QC limits with any exceptions noted below.

Matrix Spikes:
All percent recoveries and relative percent differences (RPDs) were within acceptance criteria with any exceptions noted below.

Duplicate Sample:
All duplicate sample results were within method acceptance criteria with any exceptions noted below.

Additional Comments:

This data package has been reviewed for quality and completeness and is approved for release.

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ANALYTICAL RESULTS

Project: Black Pine Mine
Pace Project No.: 10163635

Sample: CMN-SS-15 **Lab ID: 10163635001** Collected: 07/13/11 13:45 Received: 07/14/11 21:00 Matrix: Solid

Results reported on a "dry-weight" basis

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
6020 MET ICPMS	Analytical Method: EPA 6020 Preparation Method: EPA 3050							
Antimony	**6.6**	mg/kg	0.53	20	07/25/11 08:21	07/29/11 01:03	7440-36-0	
Arsenic	**11.5**	mg/kg	0.53	20	07/25/11 08:21	07/29/11 01:03	7440-38-2	
Barium	**63.6**	mg/kg	0.32	20	07/25/11 08:21	07/29/11 01:03	7440-39-3	M6
Cadmium	**0.60**	mg/kg	0.084	20	07/25/11 08:21	07/29/11 01:03	7440-43-9	
Chromium	**3.2**	mg/kg	0.53	20	07/25/11 08:21	07/29/11 01:03	7440-47-3	
Copper	**88.5**	mg/kg	0.53	20	07/25/11 08:21	07/29/11 01:03	7440-50-8	M6
Iron	**4490**	mg/kg	52.7	20	07/25/11 08:21	07/29/11 01:03	7439-89-6	M6
Lead	**62.1**	mg/kg	0.11	20	07/25/11 08:21	07/29/11 01:03	7439-92-1	M6
Manganese	**226**	mg/kg	0.53	20	07/25/11 08:21	07/29/11 01:03	7439-96-5	M6
Nickel	**2.6**	mg/kg	0.53	20	07/25/11 08:21	07/29/11 01:03	7440-02-0	
Silver	**<0.53**	mg/kg	0.53	20	07/25/11 08:21	07/29/11 01:03	7440-22-4	
Zinc	**55.4**	mg/kg	5.3	20	07/25/11 08:21	07/29/11 01:03	7440-66-6	M6
7471 Mercury	Analytical Method: EPA 7471 Preparation Method: EPA 7471							
Mercury	**0.093**	mg/kg	0.023	1	07/22/11 14:30	07/27/11 14:06	7439-97-6	
Dry Weight	Analytical Method: % Moisture							
Percent Moisture	**21.6**	%	0.10	1		07/21/11 00:00		

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ANALYTICAL RESULTS

Project: Black Pine Mine
Pace Project No.: 10163635

Sample: CMN-SS-16 **Lab ID: 10163635002** Collected: 07/13/11 13:55 Received: 07/14/11 21:00 Matrix: Solid

Results reported on a "dry-weight" basis

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
6020 MET ICPMS	Analytical Method: EPA 6020 Preparation Method: EPA 3050							
Antimony	**36.7**	mg/kg	0.51	20	07/25/11 08:21	07/29/11 01:21	7440-36-0	
Arsenic	**31.7**	mg/kg	0.51	20	07/25/11 08:21	07/29/11 01:21	7440-38-2	
Barium	**89.9**	mg/kg	0.31	20	07/25/11 08:21	07/29/11 01:21	7440-39-3	
Cadmium	**2.9**	mg/kg	0.082	20	07/25/11 08:21	07/29/11 01:21	7440-43-9	
Chromium	**5.0**	mg/kg	0.51	20	07/25/11 08:21	07/29/11 01:21	7440-47-3	
Copper	**295**	mg/kg	0.51	20	07/25/11 08:21	07/29/11 01:21	7440-50-8	
Iron	**7450**	mg/kg	51.0	20	07/25/11 08:21	07/29/11 01:21	7439-89-6	
Lead	**182**	mg/kg	0.10	20	07/25/11 08:21	07/29/11 01:21	7439-92-1	
Manganese	**556**	mg/kg	2.5	100	07/25/11 08:21	07/29/11 01:26	7439-96-5	
Nickel	**4.9**	mg/kg	0.51	20	07/25/11 08:21	07/29/11 01:21	7440-02-0	
Silver	**3.2**	mg/kg	0.51	20	07/25/11 08:21	07/29/11 01:21	7440-22-4	
Zinc	**148**	mg/kg	5.1	20	07/25/11 08:21	07/29/11 01:21	7440-66-6	
7471 Mercury	Analytical Method: EPA 7471 Preparation Method: EPA 7471							
Mercury	**0.25**	mg/kg	0.024	1	07/22/11 14:30	07/27/11 14:08	7439-97-6	
Dry Weight	Analytical Method: % Moisture							
Percent Moisture	**20.2**	%	0.10	1		07/21/11 00:00		

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ANALYTICAL RESULTS

Project: Black Pine Mine
Pace Project No.: 10163635

Sample: HM-SS-10 **Lab ID: 10163635003** Collected: 07/13/11 14:25 Received: 07/14/11 21:00 Matrix: Solid

Results reported on a "dry-weight" basis

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
6020 MET ICPMS	Analytical Method: EPA 6020 Preparation Method: EPA 3050							
Antimony	**5.0**	mg/kg	0.58	20	07/25/11 08:21	07/29/11 01:30	7440-36-0	
Arsenic	**8.6**	mg/kg	0.58	20	07/25/11 08:21	07/29/11 01:30	7440-38-2	
Barium	**241**	mg/kg	0.35	20	07/25/11 08:21	07/29/11 01:30	7440-39-3	
Cadmium	**1.6**	mg/kg	0.093	20	07/25/11 08:21	07/29/11 01:30	7440-43-9	
Chromium	**10.9**	mg/kg	0.58	20	07/25/11 08:21	07/29/11 01:30	7440-47-3	
Copper	**2080**	mg/kg	2.9	100	07/25/11 08:21	07/29/11 01:35	7440-50-8	
Iron	**13800**	mg/kg	58.4	20	07/25/11 08:21	07/29/11 01:30	7439-89-6	
Lead	**99.6**	mg/kg	0.12	20	07/25/11 08:21	07/29/11 01:30	7439-92-1	
Manganese	**1400**	mg/kg	2.9	100	07/25/11 08:21	07/29/11 01:35	7439-96-5	
Nickel	**10.7**	mg/kg	0.58	20	07/25/11 08:21	07/29/11 01:30	7440-02-0	
Silver	**<0.58**	mg/kg	0.58	20	07/25/11 08:21	07/29/11 01:30	7440-22-4	
Zinc	**122**	mg/kg	5.8	20	07/25/11 08:21	07/29/11 01:30	7440-66-6	
7471 Mercury	Analytical Method: EPA 7471 Preparation Method: EPA 7471							
Mercury	**0.029**	mg/kg	0.019	1	07/22/11 14:30	07/27/11 14:10	7439-97-6	
Dry Weight	Analytical Method: % Moisture							
Percent Moisture	**17.7**	%	0.10	1		07/21/11 00:00		
Sobek Acid Base Potential	Analytical Method: Modified Sobek 3.2							
Neutralization Potential	**<0.5**	tons/1000	0.50	1		08/02/11 00:00		
Sobek Extractable Sulfur	Analytical Method: Modified Sobek 3.2							
Sulfur, HCl Extractable	**<0.050**	% (w/w)	0.050	1		08/01/11 13:19		
Sulfur, HNO3 Extractable	**<0.050**	% (w/w)	0.050	1		08/01/11 13:19		
Sulfur, Hot Water Extractable	**<0.050**	% (w/w)	0.050	1		08/01/11 13:19		
Sulfur, Residual	**<0.050**	% (w/w)	0.050	1		08/01/11 13:19		
Total Sulfur	**<0.050**	% (w/w)	0.050	1		08/01/11 13:19		
Sobek Calculations	Analytical Method: Modified Sobek 3.2							
Acid/Base Potential	**0**	tons/1000		1		08/02/11 00:00		
Acid Potential	**<4.3**	tons/1000	4.3	1		08/02/11 00:00		
Lime Requirement	**<5.4**	tons/1000	5.4	1		08/02/11 00:00		
SMP Lime Requirement	**3.9**	tons/1000	0.0	1		08/02/11 00:00		
Sobek SMP Buffer pH	Analytical Method: Modified Sobek 3.2							
SMP Buffer pH	**6.4**	Std. Units	0.10	1		07/26/11 09:40		

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ANALYTICAL RESULTS

Project: Black Pine Mine
Pace Project No.: 10163635

Sample: HM-SS-09 **Lab ID: 10163635004** Collected: 07/13/11 14:40 Received: 07/14/11 21:00 Matrix: Solid

Results reported on a "dry-weight" basis

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
6020 MET ICPMS	Analytical Method: EPA 6020 Preparation Method: EPA 3050							
Antimony	**20.6**	mg/kg	0.43	20	07/25/11 08:21	07/29/11 01:53	7440-36-0	
Arsenic	**33.8**	mg/kg	0.43	20	07/25/11 08:21	07/29/11 01:53	7440-38-2	
Barium	**179**	mg/kg	0.26	20	07/25/11 08:21	07/29/11 01:53	7440-39-3	
Cadmium	**2.2**	mg/kg	0.069	20	07/25/11 08:21	07/29/11 01:53	7440-43-9	
Chromium	**9.5**	mg/kg	0.43	20	07/25/11 08:21	07/29/11 01:53	7440-47-3	
Copper	**1390**	mg/kg	2.1	100	07/25/11 08:21	07/29/11 01:57	7440-50-8	
Iron	**13000**	mg/kg	42.8	20	07/25/11 08:21	07/29/11 01:53	7439-89-6	
Lead	**375**	mg/kg	0.086	20	07/25/11 08:21	07/29/11 01:53	7439-92-1	
Manganese	**782**	mg/kg	2.1	100	07/25/11 08:21	07/29/11 01:57	7439-96-5	
Nickel	**10.4**	mg/kg	0.43	20	07/25/11 08:21	07/29/11 01:53	7440-02-0	
Silver	**5.0**	mg/kg	0.43	20	07/25/11 08:21	07/29/11 01:53	7440-22-4	
Zinc	**136**	mg/kg	4.3	20	07/25/11 08:21	07/29/11 01:53	7440-66-6	
7471 Mercury	Analytical Method: EPA 7471 Preparation Method: EPA 7471							
Mercury	**0.57**	mg/kg	0.021	1	07/22/11 14:30	07/27/11 14:12	7439-97-6	
Dry Weight	Analytical Method: % Moisture							
Percent Moisture	**17.2**	%	0.10	1		07/21/11 00:00		
Sobek Acid Base Potential	Analytical Method: Modified Sobek 3.2							
Neutralization Potential	**<0.5**	tons/1000	0.50	1		08/02/11 00:00		
Sobek Extractable Sulfur	Analytical Method: Modified Sobek 3.2							
Sulfur, HCl Extractable	**<0.050**	% (w/w)	0.050	1		08/01/11 13:51		
Sulfur, HNO3 Extractable	**<0.050**	% (w/w)	0.050	1		08/01/11 13:51		
Sulfur, Hot Water Extractable	**<0.050**	% (w/w)	0.050	1		08/01/11 13:51		
Sulfur, Residual	**<0.050**	% (w/w)	0.050	1		08/01/11 13:51		
Total Sulfur	**<0.050**	% (w/w)	0.050	1		08/01/11 13:51		
Sobek Calculations	Analytical Method: Modified Sobek 3.2							
Acid/Base Potential	**0**	tons/1000		1		08/02/11 00:00		
Acid Potential	**<4.3**	tons/1000	4.3	1		08/02/11 00:00		
Lime Requirement	**7.9**	tons/1000	5.4	1		08/02/11 00:00		
SMP Lime Requirement	**6.0**	tons/1000	0.0	1		08/02/11 00:00		
Sobek SMP Buffer pH	Analytical Method: Modified Sobek 3.2							
SMP Buffer pH	**6.0**	Std. Units	0.10	1		07/26/11 09:40		

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ANALYTICAL RESULTS

Project: Black Pine Mine
Pace Project No.: 10163635

Sample: HM-SS-12 **Lab ID: 10163635005** Collected: 07/13/11 15:00 Received: 07/14/11 21:00 Matrix: Solid

Results reported on a "dry-weight" basis

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
6020 MET ICPMS	Analytical Method: EPA 6020 Preparation Method: EPA 3050							
Antimony	**8.1**	mg/kg	0.55	20	07/25/11 08:21	07/29/11 02:02	7440-36-0	
Arsenic	**14.9**	mg/kg	0.55	20	07/25/11 08:21	07/29/11 02:02	7440-38-2	
Barium	**178**	mg/kg	0.33	20	07/25/11 08:21	07/29/11 02:02	7440-39-3	
Cadmium	**0.92**	mg/kg	0.088	20	07/25/11 08:21	07/29/11 02:02	7440-43-9	
Chromium	**7.4**	mg/kg	0.55	20	07/25/11 08:21	07/29/11 02:02	7440-47-3	
Copper	**389**	mg/kg	0.55	20	07/25/11 08:21	07/29/11 02:02	7440-50-8	
Iron	**9390**	mg/kg	55.1	20	07/25/11 08:21	07/29/11 02:02	7439-89-6	
Lead	**62.9**	mg/kg	0.11	20	07/25/11 08:21	07/29/11 02:02	7439-92-1	
Manganese	**463**	mg/kg	0.55	20	07/25/11 08:21	07/29/11 02:02	7439-96-5	
Nickel	**8.8**	mg/kg	0.55	20	07/25/11 08:21	07/29/11 02:02	7440-02-0	
Silver	**1.6**	mg/kg	0.55	20	07/25/11 08:21	07/29/11 02:02	7440-22-4	
Zinc	**69.3**	mg/kg	5.5	20	07/25/11 08:21	07/29/11 02:02	7440-66-6	
7471 Mercury	Analytical Method: EPA 7471 Preparation Method: EPA 7471							
Mercury	**0.024**	mg/kg	0.023	1	07/22/11 14:30	07/27/11 14:18	7439-97-6	
Dry Weight	Analytical Method: % Moisture							
Percent Moisture	**16.7**	%	0.10	1		07/21/11 00:00		
Sobek Acid Base Potential	Analytical Method: Modified Sobek 3.2							
Neutralization Potential	**<0.5**	tons/1000	0.50	1		08/02/11 00:00		
Sobek Extractable Sulfur	Analytical Method: Modified Sobek 3.2							
Sulfur, HCl Extractable	**<0.050**	% (w/w)	0.050	1		08/01/11 14:11		
Sulfur, HNO3 Extractable	**<0.050**	% (w/w)	0.050	1		08/01/11 14:11		
Sulfur, Hot Water Extractable	**<0.050**	% (w/w)	0.050	1		08/01/11 14:11		
Sulfur, Residual	**<0.050**	% (w/w)	0.050	1		08/01/11 14:11		
Total Sulfur	**<0.050**	% (w/w)	0.050	1		08/01/11 14:11		
Sobek Calculations	Analytical Method: Modified Sobek 3.2							
Acid/Base Potential	**0**	tons/1000		1		08/02/11 00:00		
Acid Potential	**<4.3**	tons/1000	4.3	1		08/02/11 00:00		
Lime Requirement	**<5.4**	tons/1000	5.4	1		08/02/11 00:00		
SMP Lime Requirement	**3.1**	tons/1000	0.0	1		08/02/11 00:00		
Sobek SMP Buffer pH	Analytical Method: Modified Sobek 3.2							
SMP Buffer pH	**6.5**	Std. Units	0.10	1		07/26/11 09:40		

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ANALYTICAL RESULTS

Project: Black Pine Mine
Pace Project No.: 10163635

Sample: HM-SS-11 **Lab ID: 10163635006** Collected: 07/13/11 15:10 Received: 07/14/11 21:00 Matrix: Solid

Results reported on a "dry-weight" basis

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
6020 MET ICPMS	Analytical Method: EPA 6020 Preparation Method: EPA 3050							
Antimony	**31.4**	mg/kg	0.55	20	07/25/11 08:21	07/29/11 02:11	7440-36-0	
Arsenic	**57.8**	mg/kg	0.55	20	07/25/11 08:21	07/29/11 02:11	7440-38-2	
Barium	**93.9**	mg/kg	0.33	20	07/25/11 08:21	07/29/11 02:11	7440-39-3	
Cadmium	**0.70**	mg/kg	0.088	20	07/25/11 08:21	07/29/11 02:11	7440-43-9	
Chromium	**4.6**	mg/kg	0.55	20	07/25/11 08:21	07/29/11 02:11	7440-47-3	
Copper	**283**	mg/kg	0.55	20	07/25/11 08:21	07/29/11 02:11	7440-50-8	
Iron	**6140**	mg/kg	54.9	20	07/25/11 08:21	07/29/11 02:11	7439-89-6	
Lead	**267**	mg/kg	0.11	20	07/25/11 08:21	07/29/11 02:11	7439-92-1	
Manganese	**254**	mg/kg	0.55	20	07/25/11 08:21	07/29/11 02:11	7439-96-5	
Nickel	**3.9**	mg/kg	0.55	20	07/25/11 08:21	07/29/11 02:11	7440-02-0	
Silver	**6.7**	mg/kg	0.55	20	07/25/11 08:21	07/29/11 02:11	7440-22-4	
Zinc	**32.0**	mg/kg	5.5	20	07/25/11 08:21	07/29/11 02:11	7440-66-6	
7471 Mercury	Analytical Method: EPA 7471 Preparation Method: EPA 7471							
Mercury	**0.89**	mg/kg	0.022	1	07/22/11 14:30	07/27/11 14:20	7439-97-6	
Dry Weight	Analytical Method: % Moisture							
Percent Moisture	**13.3**	%	0.10	1		07/21/11 00:00		
Sobek Acid Base Potential	Analytical Method: Modified Sobek 3.2							
Neutralization Potential	**<0.5**	tons/1000	0.50	1		08/02/11 00:00		
Sobek Extractable Sulfur	Analytical Method: Modified Sobek 3.2							
Sulfur, HCl Extractable	**<0.050**	% (w/w)	0.050	1		08/01/11 14:22		
Sulfur, HNO3 Extractable	**<0.050**	% (w/w)	0.050	1		08/01/11 14:22		
Sulfur, Hot Water Extractable	**<0.050**	% (w/w)	0.050	1		08/01/11 14:22		
Sulfur, Residual	**<0.050**	% (w/w)	0.050	1		08/01/11 14:22		
Total Sulfur	**<0.050**	% (w/w)	0.050	1		08/01/11 14:22		
Sobek Calculations	Analytical Method: Modified Sobek 3.2							
Acid/Base Potential	**0**	tons/1000		1		08/02/11 00:00		
Acid Potential	**<4.3**	tons/1000	4.3	1		08/02/11 00:00		
Lime Requirement	**7.7**	tons/1000	5.4	1		08/02/11 00:00		
SMP Lime Requirement	**5.3**	tons/1000	0.0	1		08/02/11 00:00		
Sobek SMP Buffer pH	Analytical Method: Modified Sobek 3.2							
SMP Buffer pH	**6.2**	Std. Units	0.10	1		07/26/11 09:40		

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ANALYTICAL RESULTS

Project: Black Pine Mine
Pace Project No.: 10163635

Sample: HM-SS-13 **Lab ID: 10163635007** Collected: 07/14/11 08:45 Received: 07/14/11 21:00 Matrix: Solid

Results reported on a "dry-weight" basis

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
6020 MET ICPMS	Analytical Method: EPA 6020 Preparation Method: EPA 3050							
Antimony	**254**	mg/kg	0.58	20	07/25/11 08:21	07/29/11 02:20	7440-36-0	
Arsenic	**316**	mg/kg	0.58	20	07/25/11 08:21	07/29/11 02:20	7440-38-2	
Barium	**305**	mg/kg	0.35	20	07/25/11 08:21	07/29/11 02:20	7440-39-3	
Cadmium	**6.6**	mg/kg	0.092	20	07/25/11 08:21	07/29/11 02:20	7440-43-9	
Chromium	**7.2**	mg/kg	0.58	20	07/25/11 08:21	07/29/11 02:20	7440-47-3	
Copper	**1420**	mg/kg	2.9	100	07/25/11 08:21	07/29/11 02:24	7440-50-8	
Iron	**15700**	mg/kg	57.6	20	07/25/11 08:21	07/29/11 02:20	7439-89-6	
Lead	**2210**	mg/kg	0.58	100	07/25/11 08:21	07/29/11 02:24	7439-92-1	
Manganese	**1240**	mg/kg	2.9	100	07/25/11 08:21	07/29/11 02:24	7439-96-5	
Nickel	**9.2**	mg/kg	0.58	20	07/25/11 08:21	07/29/11 02:20	7440-02-0	
Silver	**42.2**	mg/kg	0.58	20	07/25/11 08:21	07/29/11 02:20	7440-22-4	
Zinc	**181**	mg/kg	5.8	20	07/25/11 08:21	07/29/11 02:20	7440-66-6	
7471 Mercury	Analytical Method: EPA 7471 Preparation Method: EPA 7471							
Mercury	**1.0**	mg/kg	0.023	1	07/22/11 14:30	07/27/11 14:22	7439-97-6	
Dry Weight	Analytical Method: % Moisture							
Percent Moisture	**14.0**	%	0.10	1		07/21/11 00:00		
Sobek Acid Base Potential	Analytical Method: Modified Sobek 3.2							
Neutralization Potential	**2.9**	tons/1000	0.50	1		08/02/11 00:00		
Sobek Extractable Sulfur	Analytical Method: Modified Sobek 3.2							
Sulfur, HCl Extractable	**<0.050**	% (w/w)	0.050	1		08/01/11 14:36		
Sulfur, HNO3 Extractable	**<0.050**	% (w/w)	0.050	1		08/01/11 14:36		
Sulfur, Hot Water Extractable	**<0.050**	% (w/w)	0.050	1		08/01/11 14:36		
Sulfur, Residual	**<0.050**	% (w/w)	0.050	1		08/01/11 14:36		
Total Sulfur	**<0.050**	% (w/w)	0.050	1		08/01/11 14:36		
Sobek Calculations	Analytical Method: Modified Sobek 3.2							
Acid/Base Potential	**2.9**	tons/1000		1		08/02/11 00:00		
Acid Potential	**<4.3**	tons/1000	4.3	1		08/02/11 00:00		
Lime Requirement	**<5.4**	tons/1000	5.4	1		08/02/11 00:00		
SMP Lime Requirement	**2.4**	tons/1000	0.0	1		08/02/11 00:00		
Sobek SMP Buffer pH	Analytical Method: Modified Sobek 3.2							
SMP Buffer pH	**6.6**	Std. Units	0.10	1		07/26/11 09:40		

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ANALYTICAL RESULTS

Project: Black Pine Mine
Pace Project No.: 10163635

Sample: HM-SS-14 **Lab ID: 10163635008** Collected: 07/14/11 08:15 Received: 07/14/11 21:00 Matrix: Solid

Results reported on a "dry-weight" basis

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
6020 MET ICPMS	Analytical Method: EPA 6020 Preparation Method: EPA 3050							
Antimony	**149**	mg/kg	0.51	20	07/25/11 08:21	07/29/11 02:29	7440-36-0	
Arsenic	**141**	mg/kg	0.51	20	07/25/11 08:21	07/29/11 02:29	7440-38-2	
Barium	**254**	mg/kg	0.31	20	07/25/11 08:21	07/29/11 02:29	7440-39-3	
Cadmium	**2.3**	mg/kg	0.082	20	07/25/11 08:21	07/29/11 02:29	7440-43-9	
Chromium	**6.5**	mg/kg	0.51	20	07/25/11 08:21	07/29/11 02:29	7440-47-3	
Copper	**662**	mg/kg	2.6	100	07/25/11 08:21	07/29/11 02:33	7440-50-8	
Iron	**12800**	mg/kg	51.4	20	07/25/11 08:21	07/29/11 02:29	7439-89-6	
Lead	**857**	mg/kg	0.51	100	07/25/11 08:21	07/29/11 02:33	7439-92-1	
Manganese	**461**	mg/kg	0.51	20	07/25/11 08:21	07/29/11 02:29	7439-96-5	
Nickel	**10.4**	mg/kg	0.51	20	07/25/11 08:21	07/29/11 02:29	7440-02-0	
Silver	**30.5**	mg/kg	0.51	20	07/25/11 08:21	07/29/11 02:29	7440-22-4	
Zinc	**135**	mg/kg	5.1	20	07/25/11 08:21	07/29/11 02:29	7440-66-6	
7471 Mercury	Analytical Method: EPA 7471 Preparation Method: EPA 7471							
Mercury	**0.26**	mg/kg	0.021	1	07/22/11 14:30	07/27/11 14:24	7439-97-6	
Dry Weight	Analytical Method: % Moisture							
Percent Moisture	**14.7**	%	0.10	1		07/21/11 00:00		
Sobek Acid Base Potential	Analytical Method: Modified Sobek 3.2							
Neutralization Potential	**<0.5**	tons/1000	0.50	1		08/02/11 00:00		
Sobek Extractable Sulfur	Analytical Method: Modified Sobek 3.2							
Sulfur, HCl Extractable	**<0.050**	% (w/w)	0.050	1		08/01/11 14:57		
Sulfur, HNO3 Extractable	**<0.050**	% (w/w)	0.050	1		08/01/11 14:57		
Sulfur, Hot Water Extractable	**<0.050**	% (w/w)	0.050	1		08/01/11 14:57		
Sulfur, Residual	**<0.050**	% (w/w)	0.050	1		08/01/11 14:57		
Total Sulfur	**<0.050**	% (w/w)	0.050	1		08/01/11 14:57		
Sobek Calculations	Analytical Method: Modified Sobek 3.2							
Acid/Base Potential	**0**	tons/1000		1		08/02/11 00:00		
Acid Potential	**<4.3**	tons/1000	4.3	1		08/02/11 00:00		
Lime Requirement	**<5.4**	tons/1000	5.4	1		08/02/11 00:00		
SMP Lime Requirement	**3.1**	tons/1000	0.0	1		08/02/11 00:00		
Sobek SMP Buffer pH	Analytical Method: Modified Sobek 3.2							
SMP Buffer pH	**6.5**	Std. Units	0.10	1		07/26/11 09:40		

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ANALYTICAL RESULTS

Project: Black Pine Mine
Pace Project No.: 10163635

Sample: HM-SS-16 **Lab ID: 10163635009** Collected: 07/14/11 10:35 Received: 07/14/11 21:00 Matrix: Solid

Results reported on a "dry-weight" basis

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
6020 MET ICPMS	Analytical Method: EPA 6020 Preparation Method: EPA 3050							
Antimony	**1160**	mg/kg	1.9	100	07/25/11 08:21	07/29/11 02:55	7440-36-0	
Arsenic	**1140**	mg/kg	1.9	100	07/25/11 08:21	07/29/11 02:55	7440-38-2	
Barium	**228**	mg/kg	0.22	20	07/25/11 08:21	07/29/11 02:51	7440-39-3	
Cadmium	**11.4**	mg/kg	0.060	20	07/25/11 08:21	07/29/11 02:51	7440-43-9	
Chromium	**2.3**	mg/kg	0.37	20	07/25/11 08:21	07/29/11 02:51	7440-47-3	
Copper	**1530**	mg/kg	1.9	100	07/25/11 08:21	07/29/11 02:55	7440-50-8	
Iron	**53600**	mg/kg	187	100	07/25/11 08:21	07/29/11 02:55	7439-89-6	
Lead	**4900**	mg/kg	1.9	500	07/25/11 08:21	07/29/11 12:43	7439-92-1	
Manganese	**64.8**	mg/kg	0.37	20	07/25/11 08:21	07/29/11 02:51	7439-96-5	
Nickel	**1.1**	mg/kg	0.37	20	07/25/11 08:21	07/29/11 02:51	7440-02-0	
Silver	**140**	mg/kg	0.37	20	07/25/11 08:21	07/29/11 02:51	7440-22-4	
Zinc	**297**	mg/kg	3.7	20	07/25/11 08:21	07/29/11 02:51	7440-66-6	
7471 Mercury	Analytical Method: EPA 7471 Preparation Method: EPA 7471							
Mercury	**13.0**	mg/kg	0.46	25	07/22/11 14:30	07/27/11 14:53	7439-97-6	M6
Dry Weight	Analytical Method: % Moisture							
Percent Moisture	**6.9**	%	0.10	1		07/21/11 00:00		
Sobek Acid Base Potential	Analytical Method: Modified Sobek 3.2							
Neutralization Potential	**<0.5**	tons/1000	0.50	1		08/02/11 00:00		
Sobek Extractable Sulfur	Analytical Method: Modified Sobek 3.2							
Sulfur, HCl Extractable	**<0.050**	% (w/w)	0.050	1		08/01/11 15:27		
Sulfur, HNO3 Extractable	**0.255**	% (w/w)	0.050	1		08/01/11 15:27		
Sulfur, Hot Water Extractable	**0.312**	% (w/w)	0.050	1		08/01/11 15:27		
Sulfur, Residual	**<0.050**	% (w/w)	0.050	1		08/01/11 15:27		
Total Sulfur	**0.452**	% (w/w)	0.050	1		08/01/11 15:27		
Sobek Calculations	Analytical Method: Modified Sobek 3.2							
Acid/Base Potential	**-8.2**	tons/1000		1		08/02/11 00:00		
Acid Potential	**8.2**	tons/1000	4.3	1		08/02/11 00:00		
Lime Requirement	**16.9**	tons/1000	5.4	1		08/02/11 00:00		
SMP Lime Requirement	**5.3**	tons/1000	0.0	1		08/02/11 00:00		
Sobek SMP Buffer pH	Analytical Method: Modified Sobek 3.2							
SMP Buffer pH	**6.2**	Std. Units	0.10	1		07/26/11 09:40		

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QUALITY CONTROL DATA

Project: Black Pine Mine
Pace Project No.: 10163635

QC Batch: MPRP/27162 Analysis Method: EPA 6020
QC Batch Method: EPA 3050 Analysis Description: 6020 MET
Associated Lab Samples: 10163635001, 10163635002, 10163635003, 10163635004, 10163635005, 10163635006, 10163635007, 10163635008, 10163635009

METHOD BLANK: 1014828 Matrix: Solid
Associated Lab Samples: 10163635001, 10163635002, 10163635003, 10163635004, 10163635005, 10163635006, 10163635007, 10163635008, 10163635009

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Antimony	mg/kg	<0.50	0.50	07/29/11 00:55	
Arsenic	mg/kg	<0.50	0.50	07/29/11 00:55	
Barium	mg/kg	<0.30	0.30	07/29/11 00:55	
Cadmium	mg/kg	<0.079	0.079	07/29/11 00:55	
Chromium	mg/kg	<0.50	0.50	07/29/11 00:55	
Copper	mg/kg	<0.50	0.50	07/29/11 00:55	
Iron	mg/kg	<49.5	49.5	07/29/11 00:55	
Lead	mg/kg	0.17	0.099	07/29/11 00:55	P8
Manganese	mg/kg	<0.50	0.50	07/29/11 00:55	
Nickel	mg/kg	<0.50	0.50	07/29/11 00:55	
Silver	mg/kg	<0.50	0.50	07/29/11 00:55	
Zinc	mg/kg	<5.0	5.0	07/29/11 00:55	

LABORATORY CONTROL SAMPLE: 1014829

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Antimony	mg/kg	14.2	15.2	107	75-125	
Arsenic	mg/kg	14.2	15.1	106	75-125	
Barium	mg/kg	14.2	15.1	106	75-125	
Cadmium	mg/kg	14.2	15.2	108	75-125	
Chromium	mg/kg	14.2	15.7	110	75-125	
Copper	mg/kg	14.2	16.6	117	75-125	
Iron	mg/kg	177	197	111	75-125	
Lead	mg/kg	14.2	15.6	110	75-125	
Manganese	mg/kg	14.2	15.5	110	75-125	
Nickel	mg/kg	14.2	16.1	114	75-125	
Silver	mg/kg	14.2	16.0	113	75-125	
Zinc	mg/kg	14.2	16.4	116	75-125	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 1014830 1014831

Parameter	Units	10163635001 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Antimony	mg/kg	6.6	21.3	22.2	25.5	28.1	89	97	75-125	10	20	
Arsenic	mg/kg	11.5	21.3	22.2	34.9	36.6	110	113	75-125	5	20	
Barium	mg/kg	63.6	21.3	22.2	105	111	195	213	75-125	5	20	M6
Cadmium	mg/kg	0.60	21.3	22.2	22.8	24.5	105	108	75-125	7	20	
Chromium	mg/kg	3.2	21.3	22.2	27.3	29.2	113	117	75-125	7	20	

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Billings, MT 591014549
(406)254-7226

QUALITY CONTROL DATA

Project: Black Pine Mine
Pace Project No.: 10163635

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 1014830 1014831

Parameter	Units	10163635001 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Copper	mg/kg	88.5	21.3	22.2	95.8	90.7	34	10	75-125	5	20	M6
Iron	mg/kg	4490	265	277	5620	5330	422	302	75-125	5	20	M6
Lead	mg/kg	62.1	21.3	22.2	89.9	106	131	198	75-125	17	20	M6
Manganese	mg/kg	226	21.3	22.2	385	284	748	264	75-125	30	20	D6,M6
Nickel	mg/kg	2.6	21.3	22.2	26.9	28.5	114	117	75-125	6	20	
Silver	mg/kg	<0.53	21.3	22.2	23.3	25.5	107	113	75-125	9	20	
Zinc	mg/kg	55.4	21.3	22.2	90.6	88.4	165	148	75-125	3	20	M6

MATRIX SPIKE SAMPLE: 1014832

Parameter	Units	258469017 Result	Spike Conc.	MS Result	MS % Rec	% Rec Limits	Qualifiers
Antimony	mg/kg		23.9	16.3	64	75-125	M6
Arsenic	mg/kg		23.9	60.4	38	75-125	M6
Barium	mg/kg		23.9	83.7	104	75-125	
Cadmium	mg/kg		23.9	25.1	104	75-125	
Chromium	mg/kg		23.9	77.3	81	75-125	
Copper	mg/kg		23.9	118	-.4	75-125	M6
Iron	mg/kg		299	45400	-2770	75-125	M6
Lead	mg/kg	6530 ug/kg	23.9	30.3	100	75-125	
Manganese	mg/kg		23.9	1040	-232	75-125	M6
Nickel	mg/kg		23.9	61.1	83	75-125	
Silver	mg/kg		23.9	25.6	106	75-125	
Zinc	mg/kg	88700 ug/kg	23.9	105	68	75-125	M6

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QUALITY CONTROL DATA

Project: Black Pine Mine
Pace Project No.: 10163635

QC Batch: MERP/5648 Analysis Method: EPA 7471
QC Batch Method: EPA 7471 Analysis Description: 7471 Mercury
Associated Lab Samples: 10163635001, 10163635002, 10163635003, 10163635004, 10163635005, 10163635006, 10163635007, 10163635008, 10163635009

METHOD BLANK: 1016595 Matrix: Solid
Associated Lab Samples: 10163635001, 10163635002, 10163635003, 10163635004, 10163635005, 10163635006, 10163635007, 10163635008, 10163635009

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Mercury	mg/kg	<0.019	0.019	07/27/11 13:13	

LABORATORY CONTROL SAMPLE: 1016596

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Mercury	mg/kg	.47	0.51	108	80-120	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 1016597 1016598

Parameter	Units	10163606001 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Mercury	mg/kg	0.86	.54	.57	0.77	1.3	-16	75	80-120	50	20	D6,M1

MATRIX SPIKE SAMPLE: 1016599

Parameter	Units	10163635009 Result	Spike Conc.	MS Result	MS % Rec	% Rec Limits	Qualifiers
Mercury	mg/kg	13.0	.52	13.3	53	80-120	M6

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QUALITY CONTROL DATA

Project: Black Pine Mine
Pace Project No.: 10163635

QC Batch: MPRP/27258
QC Batch Method: % Moisture
Analysis Method: % Moisture
Analysis Description: Dry Weight/Percent Moisture
Associated Lab Samples: 10163635001, 10163635002, 10163635003, 10163635004, 10163635005, 10163635006, 10163635007, 10163635008, 10163635009

SAMPLE DUPLICATE: 1017623

Parameter	Units	10163606004 Result	Dup Result	RPD	Max RPD	Qualifiers
Percent Moisture	%	15.0	14.2	5	30	

SAMPLE DUPLICATE: 1017624

Parameter	Units	10163635009 Result	Dup Result	RPD	Max RPD	Qualifiers
Percent Moisture	%	6.9	7.6	9	30	

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QUALITY CONTROL DATA

Project: Black Pine Mine
Pace Project No.: 10163635

QC Batch: MT/6496 Analysis Method: Modified Sobek 3.2
QC Batch Method: Modified Sobek 3.2 Analysis Description: Sobek Acid Base Potential
Associated Lab Samples: 10163635003, 10163635004, 10163635005, 10163635006, 10163635007, 10163635008, 10163635009

METHOD BLANK: 1020547 Matrix: Solid
Associated Lab Samples: 10163635003, 10163635004, 10163635005, 10163635006, 10163635007, 10163635008, 10163635009

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Neutralization Potential	tons/1000	<0.5	0.50	08/02/11 00:00	

SAMPLE DUPLICATE: 1020546

Parameter	Units	10163635003 Result	Dup Result	RPD	Max RPD	Qualifiers
Neutralization Potential	tons/1000	<0.5	0.97			

SAMPLE DUPLICATE: 1020548

Parameter	Units	10163633009 Result	Dup Result	RPD	Max RPD	Qualifiers
Neutralization Potential	tons/1000	<0.5	6.5			

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QUALITY CONTROL DATA

Project: Black Pine Mine
Pace Project No.: 10163635

QC Batch: MT/6487 Analysis Method: Modified Sobek 3.2
QC Batch Method: Modified Sobek 3.2 Analysis Description: Sobek Extractable Sulfur
Associated Lab Samples: 10163635003, 10163635004, 10163635005, 10163635006, 10163635007, 10163635008, 10163635009

METHOD BLANK: 1019970 Matrix: Solid
Associated Lab Samples: 10163635003, 10163635004, 10163635005, 10163635006, 10163635007, 10163635008, 10163635009

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Total Sulfur	% (w/w)	<0.050	0.050	08/01/11 13:07	

SAMPLE DUPLICATE: 1019972

Parameter	Units	10163635003 Result	Dup Result	RPD	Max RPD	Qualifiers
Total Sulfur	% (w/w)	<0.050	<0.050			

SAMPLE DUPLICATE: 1019973

Parameter	Units	10163633008 Result	Dup Result	RPD	Max RPD	Qualifiers
Total Sulfur	% (w/w)	0.369	0.428	15		

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QUALITY CONTROL DATA

Project: Black Pine Mine
Pace Project No.: 10163635

QC Batch: MT/6542 Analysis Method: Modified Sobek 3.2
QC Batch Method: Modified Sobek 3.2 Analysis Description: Sobek SMP Buffer pH
Associated Lab Samples: 10163635003, 10163635004, 10163635005, 10163635006, 10163635007, 10163635008, 10163635009

SAMPLE DUPLICATE: 1022810

Parameter	Units	10163635003 Result	Dup Result	RPD	Max RPD	Qualifiers
SMP Buffer pH	Std. Units	6.4	6.4	.3	20	

SAMPLE DUPLICATE: 1026467

Parameter	Units	10163633008 Result	Dup Result	RPD	Max RPD	Qualifiers
SMP Buffer pH	Std. Units	7.4	7.4	.1	20	

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QUALIFIERS

Project: Black Pine Mine
Pace Project No.: 10163635

DEFINITIONS

DF - Dilution Factor, if reported, represents the factor applied to the reported data due to changes in sample preparation, dilution of the sample aliquot, or moisture content.

ND - Not Detected at or above adjusted reporting limit.

J - Estimated concentration above the adjusted method detection limit and below the adjusted reporting limit.

MDL - Adjusted Method Detection Limit.

S - Surrogate

1,2-Diphenylhydrazine (8270 listed analyte) decomposes to Azobenzene.

Consistent with EPA guidelines, unrounded data are displayed and have been used to calculate % recovery and RPD values.

LCS(D) - Laboratory Control Sample (Duplicate)

MS(D) - Matrix Spike (Duplicate)

DUP - Sample Duplicate

RPD - Relative Percent Difference

NC - Not Calculable.

SG - Silica Gel - Clean-Up

U - Indicates the compound was analyzed for, but not detected.

N-Nitrosodiphenylamine decomposes and cannot be separated from Diphenylamine using Method 8270. The result reported for each analyte is a combined concentration.

LABORATORIES

PASI-M	Pace Analytical Services - Minneapolis
PASI-MT	Pace Analytical Services - Montana

ANALYTE QUALIFIERS

D6	The relative percent difference (RPD) between the sample and sample duplicate exceeded laboratory control limits.
M1	Matrix spike recovery exceeded QC limits. Batch accepted based on laboratory control sample (LCS) recovery.
M6	Matrix spike and Matrix spike duplicate recovery not evaluated against control limits due to sample dilution.
P8	Analyte was detected in the method blank. All associated samples had concentrations of at least ten times greater than the blank or were below the reporting limit.

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QUALITY CONTROL DATA CROSS REFERENCE TABLE

Project: Black Pine Mine
Pace Project No.: 10163635

Lab ID	Sample ID	QC Batch Method	QC Batch	Analytical Method	Analytical Batch
10163635001	**CMN-SS-15**	EPA 3050	MPRP/27162	EPA 6020	ICPM/11086
10163635002	**CMN-SS-16**	EPA 3050	MPRP/27162	EPA 6020	ICPM/11086
10163635003	**HM-SS-10**	EPA 3050	MPRP/27162	EPA 6020	ICPM/11086
10163635004	**HM-SS-09**	EPA 3050	MPRP/27162	EPA 6020	ICPM/11086
10163635005	**HM-SS-12**	EPA 3050	MPRP/27162	EPA 6020	ICPM/11086
10163635006	**HM-SS-11**	EPA 3050	MPRP/27162	EPA 6020	ICPM/11086
10163635007	**HM-SS-13**	EPA 3050	MPRP/27162	EPA 6020	ICPM/11086
10163635008	**HM-SS-14**	EPA 3050	MPRP/27162	EPA 6020	ICPM/11086
10163635009	**HM-SS-16**	EPA 3050	MPRP/27162	EPA 6020	ICPM/11086
10163635001	**CMN-SS-15**	EPA 7471	MERP/5648	EPA 7471	MERC/6470
10163635002	**CMN-SS-16**	EPA 7471	MERP/5648	EPA 7471	MERC/6470
10163635003	**HM-SS-10**	EPA 7471	MERP/5648	EPA 7471	MERC/6470
10163635004	**HM-SS-09**	EPA 7471	MERP/5648	EPA 7471	MERC/6470
10163635005	**HM-SS-12**	EPA 7471	MERP/5648	EPA 7471	MERC/6470
10163635006	**HM-SS-11**	EPA 7471	MERP/5648	EPA 7471	MERC/6470
10163635007	**HM-SS-13**	EPA 7471	MERP/5648	EPA 7471	MERC/6470
10163635008	**HM-SS-14**	EPA 7471	MERP/5648	EPA 7471	MERC/6470
10163635009	**HM-SS-16**	EPA 7471	MERP/5648	EPA 7471	MERC/6470
10163635001	**CMN-SS-15**	% Moisture	MPRP/27258		
10163635002	**CMN-SS-16**	% Moisture	MPRP/27258		
10163635003	**HM-SS-10**	% Moisture	MPRP/27258		
10163635004	**HM-SS-09**	% Moisture	MPRP/27258		
10163635005	**HM-SS-12**	% Moisture	MPRP/27258		
10163635006	**HM-SS-11**	% Moisture	MPRP/27258		
10163635007	**HM-SS-13**	% Moisture	MPRP/27258		
10163635008	**HM-SS-14**	% Moisture	MPRP/27258		
10163635009	**HM-SS-16**	% Moisture	MPRP/27258		
10163635003	**HM-SS-10**	Modified Sobek 3.2	MT/6496		
10163635004	**HM-SS-09**	Modified Sobek 3.2	MT/6496		
10163635005	**HM-SS-12**	Modified Sobek 3.2	MT/6496		
10163635006	**HM-SS-11**	Modified Sobek 3.2	MT/6496		
10163635007	**HM-SS-13**	Modified Sobek 3.2	MT/6496		
10163635008	**HM-SS-14**	Modified Sobek 3.2	MT/6496		
10163635009	**HM-SS-16**	Modified Sobek 3.2	MT/6496		
10163635003	**HM-SS-10**	Modified Sobek 3.2	MT/6487		
10163635004	**HM-SS-09**	Modified Sobek 3.2	MT/6487		
10163635005	**HM-SS-12**	Modified Sobek 3.2	MT/6487		
10163635006	**HM-SS-11**	Modified Sobek 3.2	MT/6487		
10163635007	**HM-SS-13**	Modified Sobek 3.2	MT/6487		
10163635008	**HM-SS-14**	Modified Sobek 3.2	MT/6487		
10163635009	**HM-SS-16**	Modified Sobek 3.2	MT/6487		
10163635003	**HM-SS-10**	Modified Sobek 3.2	MT/6500		
10163635004	**HM-SS-09**	Modified Sobek 3.2	MT/6500		
10163635005	**HM-SS-12**	Modified Sobek 3.2	MT/6500		
10163635006	**HM-SS-11**	Modified Sobek 3.2	MT/6500		
10163635007	**HM-SS-13**	Modified Sobek 3.2	MT/6500		

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QUALITY CONTROL DATA CROSS REFERENCE TABLE

Project: Black Pine Mine
Pace Project No.: 10163635

Lab ID	Sample ID	QC Batch Method	QC Batch	Analytical Method	Analytical Batch
10163635008	**HM-SS-14**	Modified Sobek 3.2	MT/6500		
10163635009	**HM-SS-16**	Modified Sobek 3.2	MT/6500		
10163635003	**HM-SS-10**	Modified Sobek 3.2	MT/6542		
10163635004	**HM-SS-09**	Modified Sobek 3.2	MT/6542		
10163635005	**HM-SS-12**	Modified Sobek 3.2	MT/6542		
10163635006	**HM-SS-11**	Modified Sobek 3.2	MT/6542		
10163635007	**HM-SS-13**	Modified Sobek 3.2	MT/6542		
10163635008	**HM-SS-14**	Modified Sobek 3.2	MT/6542		
10163635009	**HM-SS-16**	Modified Sobek 3.2	MT/6542		

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CHAIN-OF-CUSTODY / Analytical Request Document

The Chain-of-Custody is a LEGAL DOCUMENT. All relevant fields must be completed accurately.

Page: 1 of 1

1429993

Section A Required Client Information:	Section B Required Project Information:	Section C Invoice Information:
Company: Herrera	Report To: Kevin Howe	Attention:
Address:	Copy To: Mark Donner	Company Name: DEQ
		Address:
Email To:	Purchase Order No.:	Pace Quote Reference:
Phone: Fax:	Project Name: Black Pine Mine	Pace Project Manager:
Requested Due Date/TAT:	Project Number:	Pace Profile #:

REGULATORY AGENCY

☐ NPDES ☐ GROUND WATER ☐ DRINKING WATER

☐ UST ☐ RCRA ☐ OTHER

Site Location STATE: ____

Requested Analysis Filtered (Y/N)

Section D Required Client Information

SAMPLE ID
(A-Z, 0-9 / ,-)
Sample IDs MUST BE UNIQUE

Matrix Codes — MATRIX / CODE
Drinking Water DW
Water WT
Waste Water WW
Product P
Soil/Solid SL
Oil OL
Wipe WP
Air AR
Tissue TS
Other OT

ITEM #	SAMPLE ID	MATRIX CODE (see valid codes to left)	SAMPLE TYPE (G=GRAB C=COMP)	COLLECTED COMPOSITE START DATE	COLLECTED COMPOSITE START TIME	COLLECTED COMPOSITE END/GRAB DATE	COLLECTED COMPOSITE END/GRAB TIME	SAMPLE TEMP AT COLLECTION	# OF CONTAINERS	Preservatives: Unpreserved	H_2SO_4	HNO_3	HCl	NaOH	$Na_2S_2O_3$	Methanol	Other	Analysis Test Y/N	Total Metals 1311	Residual Chlorine (Y/N)	Pace Project No./ Lab I.D.
1	CMW-SS-15	SL	G	7/13/11	1345				1	X								X	Y		001
2	CMW-SS-16			7/13/11	1355				1	X								X	Y		002
3	HM-SS-10				1425				2	X								X	Y		003
4	HM-SS-09				1440				2	X								X	Y		004
5	HM-SS-12			↓	1500				2	X								X	Y		005
6	HM-SS-11			7/13/11	1500				2	X								X	Y		006
7	HM-SS-13			7/14/11	0845				2	X								X	Y		007
8	HM-SS-14			7/14/11	0845				2	X								X	Y		008
9	HM-SS-16	↓	↓	7/14/11	1035				2	X								X	Y		009
10																					
11																					
12																					

ADDITIONAL COMMENTS	RELINQUISHED BY / AFFILIATION	DATE	TIME	ACCEPTED BY / AFFILIATION	DATE	TIME	SAMPLE CONDITIONS
	[signature] / Herrera	7/14/11	1540	[signature]	7/14/11	3:43	
	[signature]	7/14/11	9:00	Norma C. Trumble/Pace	7/14/11	2100	
							4.6 / Y / N / Y

Temp in °C | Received on Ice (Y/N) | Custody Sealed Cooler (Y/N) | Samples Intact (Y/N)

ORIGINAL

SAMPLER NAME AND SIGNATURE

PRINT Name of SAMPLER: Luke Dupree II

SIGNATURE of SAMPLER: [signature] DATE Signed (MM/DD/YY): 7/14/11

*Important Note: By signing this form you are accepting Pace's NET 30 day payment terms and agreeing to late charges of 1.5% per month for any invoices not paid within 30 days.

F-ALL-Q-020rev.07, 15-May-2007

Sample Condition Upon Receipt

Pace Analytical

Client Name: Herrera Project # 1683635

Courier: ☐ Fed Ex ☐ UPS ☐ USPS ☐ Client ☐ Commercial ☒ Pace Other _____

Tracking #: Walk in BA face

Custody Seal on Cooler/Box Present: ☐ yes ☒ no Seals intact: ☐ yes ☒ no

Packing Material: ☒ Bubble Wrap ☐ Bubble Bags ☐ None ☐ Other _____ Temp Blank: Yes ∞ No _____

Thermometer Used: 1383045 or 135 Type of Ice: (Wet) Blue None ☒ Samples on ice, cooling process has begun

Cooler Temperature: 4.6° Biological Tissue is Frozen: Yes No

Date and Initials of person examining contents: RW 7/16/11

Temp should be above freezing to 6°C

Comments:

Chain of Custody Present:	☒Yes	☐No	☐N/A
Chain of Custody Filled Out:	☒Yes	☐No	☐N/A
Chain of Custody Relinquished:	☒Yes	☐No	☐N/A
Sampler Name & Signature on COC:	☒Yes	☐No	☐N/A
Samples Arrived within Hold Time:	☒Yes	☐No	☐N/A
Short Hold Time Analysis (<72hr):	☐Yes	☒No	☐N/A
Rush Turn Around Time Requested:	☐Yes	☒No	☐N/A
Sufficient Volume:	☒Yes	☐No	☐N/A
Correct Containers Used:	☒Yes	☐No	☐N/A
-Pace Containers Used:	☒Yes	☐No	☐N/A
Containers Intact:	☒Yes	☐No	☐N/A
Filtered volume received for Dissolved tests	☐Yes	☐No	☒N/A
Sample Labels match COC: RW 7/16/11	☒Yes	☐No	☐N/A
-Includes date/time/ID/Analysis Matrix: WS SL			
All containers needing acid/base preservation have been checked. Noncompliance are noted in 13.	☐Yes	☐No	☒N/A
All containers needing preservation are found to be in compliance with EPA recommendation.	☐Yes	☐No	☒N/A
Exceptions: VOA,Coliform, TOC, Oil and Grease, WI-DRO (water)	☐Yes	☒No	N/A
Samples checked for dechlorination:	☐Yes	☐No	☒N/A
Headspace in VOA Vials (>6mm):	☐Yes	☐No	☒N/A
Trip Blank Present:	☐Yes	☐No	☒N/A
Trip Blank Custody Seals Present	☐Yes	☐No	☒N/A
Pace Trip Blank Lot # (if purchased): N/A			

1. 2. 3. 4. 5. 6. 7. 8.

9. PB

10. 11.

12. Missing ABA bags for samples 001 + 002

13. ☐ HNO3 ☐ H2SO4 ☐ NaOH ☐ HCl

Samp #

Initial when completed	Lot # of added preservative

14. 15. 16.

Client Notification/ Resolution: Field Data Required? Y / N

Person Contacted: Kevin Date/Time: 7/17/11 email

Comments/ Resolution:

Contacted Client about missing sample volume

Project Manager Review: Billy Hoyt **Date:** 7/17/11

Note: Whenever there is a discrepancy affecting North Carolina compliance samples, a copy of this form will be sent to the North Carolina DEHNR Certification Office (i.e out of hold, incorrect preservative, out of temp, incorrect containers)

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(406)254-7226

August 12, 2011

Kevin Houck
Herrera Environmental Consultants
101 East Broadway, Suite 610
Missoula, MT 59802

RE: Project: Black Pine Mine
Pace Project No.: 10163640

Dear Kevin Houck:
Enclosed are the analytical results for sample(s) received by the laboratory on July 17, 2011. The results relate only to the samples included in this report.

If you have any questions concerning this report, please feel free to contact me.

Sincerely,

Sally Heinje

sally.heinje@pacelabs.com
Project Manager

Enclosures

cc: Devin Clary, Montana Dept. of Environmental Quality
Mark Donner, Trihydro

REPORT OF LABORATORY ANALYSIS

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CERTIFICATIONS

Project: Black Pine Mine
Pace Project No.: 10163640

Minnesota Certification IDs

1700 Elm Street SE Suite 200, Minneapolis, MN 55414
A2LA Certification #: 2926.01
Alaska Certification #: UST-078
Alaska Certification #MN00064
Arizona Certification #: AZ-0014
Arkansas Certification #: 88-0680
California Certification #: 01155CA
EPA Region 8 Certification #: Pace
Florida/NELAP Certification #: E87605
Georgia Certification #: 959
Idaho Certification #: MN00064
Illinois Certification #: 200011
Iowa Certification #: 368
Kansas Certification #: E-10167
Louisiana Certification #: 03086
Louisiana Certification #: LA080009
Maine Certification #: 2007029
Maryland Certification #: 322
Michigan DEQ Certification #: 9909
Minnesota Certification #: 027-053-137
Mississippi Certification #: Pace
Montana Certification #: MT CERT0092
Nebraska Certification #: Pace
Nevada Certification #: MN_00064
New Jersey Certification #: MN-002
New Mexico Certification #: Pace
New York Certification #: 11647
North Carolina Certification #: 530
North Dakota Certification #: R-036
North Dakota Certification #: R-036A
Ohio VAP Certification #: CL101
Oklahoma Certification #: D9921
Oklahoma Certification #: 9507
Oregon Certification #: MN200001
Pennsylvania Certification #: 68-00563
Puerto Rico Certification
Tennessee Certification #: 02818
Texas Certification #: T104704192
Washington Certification #: C754
Wisconsin Certification #: 999407970

Montana Certification IDs

602 South 25th Street, Billings, MT 59101
EPA Region 8 Certification #: 8TMS-Q
Idaho Certification #: MT00012
Montana Certification #: MT CERT0040
NVLAP Certification #: 101292-0
Minnesota Dept of Health Certification #: 030-999-442

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SAMPLE SUMMARY

Project: Black Pine Mine
Pace Project No.: 10163640

Lab ID	Sample ID	Matrix	Date Collected	Date Received
10163640001	**BP-CML-TS-04-00**	Solid	07/15/11 11:05	07/17/11 19:19
10163640002	**BP-CML-TS-04-02**	Solid	07/15/11 11:07	07/17/11 19:19
10163640003	**BP-CML-SS-04-06**	Solid	07/15/11 11:10	07/17/11 19:19
10163640004	**BP-CML-TS-05-00**	Solid	07/15/11 11:33	07/17/11 19:19
10163640005	**BP-CML-TS-05-02**	Solid	07/15/11 11:35	07/17/11 19:19
10163640006	**BP-CML-SS-05-04**	Solid	07/15/11 11:40	07/17/11 19:19
10163640007	**BP-CML-TS-06-00**	Solid	07/15/11 12:10	07/17/11 19:19
10163640008	**BP-CML-TS-06-02**	Solid	07/15/11 12:13	07/17/11 19:19
10163640009	**BP-CML-SS-06-05**	Solid	07/15/11 12:15	07/17/11 19:19

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SAMPLE ANALYTE COUNT

Project: Black Pine Mine
Pace Project No.: 10163640

Lab ID	Sample ID	Method	Analysts	Analytes Reported	Laboratory
10163640001	**BP-CML-TS-04-00**	EPA 6020	RJS	12	PASI-M
		EPA 7471	TEM	1	PASI-M
		% Moisture	AMH	1	PASI-M
10163640002	**BP-CML-TS-04-02**	EPA 6020	RJS	12	PASI-M
		EPA 7471	TEM	1	PASI-M
		% Moisture	AMH	1	PASI-M
		Modified Sobek 3.2	JH1	1	PASI-MT
		Modified Sobek 3.2	JH1	5	PASI-MT
		Modified Sobek 3.2	JH1	4	PASI-MT
		Modified Sobek 3.2	JH1	1	PASI-MT
10163640003	**BP-CML-SS-04-06**	EPA 6020	RJS	12	PASI-M
		EPA 7471	TEM	1	PASI-M
		% Moisture	JDL	1	PASI-M
10163640004	**BP-CML-TS-05-00**	EPA 6020	RJS	12	PASI-M
		EPA 7471	TEM	1	PASI-M
		% Moisture	JDL	1	PASI-M
10163640005	**BP-CML-TS-05-02**	EPA 6020	CJS, TL1	12	PASI-M
		EPA 7471	TEM	1	PASI-M
		% Moisture	JDL	1	PASI-M
		Modified Sobek 3.2	JH1	1	PASI-MT
		Modified Sobek 3.2	JH1	5	PASI-MT
		Modified Sobek 3.2	JH1	4	PASI-MT
		Modified Sobek 3.2	JH1	1	PASI-MT
10163640006	**BP-CML-SS-05-04**	EPA 6020	CJS, TL1	12	PASI-M
		EPA 7471	TEM	1	PASI-M
		% Moisture	JDL	1	PASI-M
10163640007	**BP-CML-TS-06-00**	EPA 6020	CJS, TL1	12	PASI-M
		EPA 7471	TEM	1	PASI-M
		% Moisture	JDL	1	PASI-M
10163640008	**BP-CML-TS-06-02**	EPA 6020	CJS, TL1	12	PASI-M
		EPA 7471	TEM	1	PASI-M
		% Moisture	JDL	1	PASI-M
		Modified Sobek 3.2	JH1	1	PASI-MT
		Modified Sobek 3.2	JH1	5	PASI-MT
		Modified Sobek 3.2	JH1	4	PASI-MT
		Modified Sobek 3.2	JH1	1	PASI-MT
10163640009	**BP-CML-SS-06-05**	EPA 6020	CJS, TL1	12	PASI-M

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SAMPLE ANALYTE COUNT

Project: Black Pine Mine
Pace Project No.: 10163640

Lab ID	Sample ID	Method	Analysts	Analytes Reported	Laboratory
		EPA 7471	TEM	1	PASI-M
		% Moisture	JDL	1	PASI-M

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PROJECT NARRATIVE

Project: Black Pine Mine
Pace Project No.: 10163640

Method: **EPA 6020**
Description: 6020 MET ICPMS
Client: Montana Dept. of Environmental Quality
Date: August 12, 2011

General Information:
9 samples were analyzed for EPA 6020. All samples were received in acceptable condition with any exceptions noted below.

Hold Time:
The samples were analyzed within the method required hold times with any exceptions noted below.

Sample Preparation:
The samples were prepared in accordance with EPA 3050 with any exceptions noted below.

Initial Calibrations (including MS Tune as applicable):
All criteria were within method requirements with any exceptions noted below.

Continuing Calibration:
All criteria were within method requirements with any exceptions noted below.

Internal Standards:
All internal standards were within QC limits with any exceptions noted below.

Method Blank:
All analytes were below the report limit in the method blank with any exceptions noted below.

Laboratory Control Spike:
All laboratory control spike compounds were within QC limits with any exceptions noted below.

Matrix Spikes:
All percent recoveries and relative percent differences (RPDs) were within acceptance criteria with any exceptions noted below.

QC Batch: MPRP/27235

A matrix spike and matrix spike duplicate (MS/MSD) were performed on the following sample(s): 10163982001

M6: Matrix spike and Matrix spike duplicate recovery not evaluated against control limits due to sample dilution.

- MS (Lab ID: 1017007)
  - Copper
  - Iron
  - Lead
  - Manganese
  - Silver
  - Zinc
- MSD (Lab ID: 1017008)
  - Antimony
  - Barium
  - Copper
  - Iron
  - Lead
  - Manganese

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PROJECT NARRATIVE

Project: Black Pine Mine
Pace Project No.: 10163640

Method: **EPA 6020**
Description: 6020 MET ICPMS
Client: Montana Dept. of Environmental Quality
Date: August 12, 2011

QC Batch: MPRP/27235

A matrix spike and matrix spike duplicate (MS/MSD) were performed on the following sample(s): 10163982001

M6: Matrix spike and Matrix spike duplicate recovery not evaluated against control limits due to sample dilution.

- Zinc

QC Batch: MPRP/27167

A matrix spike and matrix spike duplicate (MS/MSD) were performed on the following sample(s): 10163483007,10163634007

M6: Matrix spike and Matrix spike duplicate recovery not evaluated against control limits due to sample dilution.

- MS (Lab ID: 1014855)
  - Antimony
  - Arsenic
  - Barium
  - Cadmium
  - Chromium
  - Copper
  - Iron
  - Lead
  - Manganese
  - Nickel
  - Zinc
- MS (Lab ID: 1014857)
  - Antimony
  - Arsenic
  - Barium
  - Cadmium
  - Chromium
  - Copper
  - Iron
  - Lead
  - Manganese
  - Nickel
  - Silver
  - Zinc
- MSD (Lab ID: 1014856)
  - Antimony
  - Arsenic
  - Barium
  - Cadmium
  - Chromium
  - Copper
  - Iron
  - Lead
  - Manganese
  - Nickel
  - Zinc

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PROJECT NARRATIVE

Project: Black Pine Mine
Pace Project No.: 10163640

Method: **EPA 6020**
Description: 6020 MET ICPMS
Client: Montana Dept. of Environmental Quality
Date: August 12, 2011

Duplicate Sample:
All duplicate sample results were within method acceptance criteria with any exceptions noted below.

Additional Comments:

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PROJECT NARRATIVE

Project: Black Pine Mine
Pace Project No.: 10163640

Method: **EPA 7471**
Description: 7471 Mercury
Client: Montana Dept. of Environmental Quality
Date: August 12, 2011

General Information:
9 samples were analyzed for EPA 7471. All samples were received in acceptable condition with any exceptions noted below.

Hold Time:
The samples were analyzed within the method required hold times with any exceptions noted below.

Sample Preparation:
The samples were prepared in accordance with EPA 7471 with any exceptions noted below.

Initial Calibrations (including MS Tune as applicable):
All criteria were within method requirements with any exceptions noted below.

Continuing Calibration:
All criteria were within method requirements with any exceptions noted below.

Method Blank:
All analytes were below the report limit in the method blank with any exceptions noted below.

Laboratory Control Spike:
All laboratory control spike compounds were within QC limits with any exceptions noted below.

Matrix Spikes:
All percent recoveries and relative percent differences (RPDs) were within acceptance criteria with any exceptions noted below.

QC Batch: MERP/5650

A matrix spike and matrix spike duplicate (MS/MSD) were performed on the following sample(s): 10163634009,10163643009

M1: Matrix spike recovery exceeded QC limits. Batch accepted based on laboratory control sample (LCS) recovery.

- MS (Lab ID: 1016609)
  - Mercury
- MSD (Lab ID: 1016610)
  - Mercury

M6: Matrix spike and Matrix spike duplicate recovery not evaluated against control limits due to sample dilution.

- MS (Lab ID: 1016611)
  - Mercury

Duplicate Sample:
All duplicate sample results were within method acceptance criteria with any exceptions noted below.

Additional Comments:

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PROJECT NARRATIVE

Project: Black Pine Mine
Pace Project No.: 10163640

Method: **Modified Sobek 3.2**
Description: Sobek Acid Base Potential
Client: Montana Dept. of Environmental Quality
Date: August 12, 2011

General Information:
3 samples were analyzed for Modified Sobek 3.2. All samples were received in acceptable condition with any exceptions noted below.

Hold Time:
The samples were analyzed within the method required hold times with any exceptions noted below.

Initial Calibrations (including MS Tune as applicable):
All criteria were within method requirements with any exceptions noted below.

Continuing Calibration:
All criteria were within method requirements with any exceptions noted below.

Internal Standards:
All internal standards were within QC limits with any exceptions noted below.

Surrogates:
All surrogates were within QC limits with any exceptions noted below.

Method Blank:
All analytes were below the report limit in the method blank with any exceptions noted below.

Laboratory Control Spike:
All laboratory control spike compounds were within QC limits with any exceptions noted below.

Matrix Spikes:
All percent recoveries and relative percent differences (RPDs) were within acceptance criteria with any exceptions noted below.

Duplicate Sample:
All duplicate sample results were within method acceptance criteria with any exceptions noted below.

Additional Comments:

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PROJECT NARRATIVE

Project: Black Pine Mine
Pace Project No.: 10163640

Method: **Modified Sobek 3.2**
Description: Sobek Extractable Sulfur
Client: Montana Dept. of Environmental Quality
Date: August 12, 2011

General Information:
3 samples were analyzed for Modified Sobek 3.2. All samples were received in acceptable condition with any exceptions noted below.

Hold Time:
The samples were analyzed within the method required hold times with any exceptions noted below.

Initial Calibrations (including MS Tune as applicable):
All criteria were within method requirements with any exceptions noted below.

Continuing Calibration:
All criteria were within method requirements with any exceptions noted below.

Internal Standards:
All internal standards were within QC limits with any exceptions noted below.

Surrogates:
All surrogates were within QC limits with any exceptions noted below.

Method Blank:
All analytes were below the report limit in the method blank with any exceptions noted below.

Laboratory Control Spike:
All laboratory control spike compounds were within QC limits with any exceptions noted below.

Matrix Spikes:
All percent recoveries and relative percent differences (RPDs) were within acceptance criteria with any exceptions noted below.

Duplicate Sample:
All duplicate sample results were within method acceptance criteria with any exceptions noted below.

Additional Comments:

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PROJECT NARRATIVE

Project: Black Pine Mine
Pace Project No.: 10163640

Method: **Modified Sobek 3.2**
Description: Sobek Calculations
Client: Montana Dept. of Environmental Quality
Date: August 12, 2011

General Information:
3 samples were analyzed for Modified Sobek 3.2. All samples were received in acceptable condition with any exceptions noted below.

Hold Time:
The samples were analyzed within the method required hold times with any exceptions noted below.

Initial Calibrations (including MS Tune as applicable):
All criteria were within method requirements with any exceptions noted below.

Continuing Calibration:
All criteria were within method requirements with any exceptions noted below.

Internal Standards:
All internal standards were within QC limits with any exceptions noted below.

Surrogates:
All surrogates were within QC limits with any exceptions noted below.

Method Blank:
All analytes were below the report limit in the method blank with any exceptions noted below.

Laboratory Control Spike:
All laboratory control spike compounds were within QC limits with any exceptions noted below.

Matrix Spikes:
All percent recoveries and relative percent differences (RPDs) were within acceptance criteria with any exceptions noted below.

Duplicate Sample:
All duplicate sample results were within method acceptance criteria with any exceptions noted below.

Additional Comments:

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PROJECT NARRATIVE

Project: Black Pine Mine
Pace Project No.: 10163640

Method: **Modified Sobek 3.2**
Description: Sobek SMP Buffer pH
Client: Montana Dept. of Environmental Quality
Date: August 12, 2011

General Information:
3 samples were analyzed for Modified Sobek 3.2. All samples were received in acceptable condition with any exceptions noted below.

Hold Time:
The samples were analyzed within the method required hold times with any exceptions noted below.

Initial Calibrations (including MS Tune as applicable):
All criteria were within method requirements with any exceptions noted below.

Continuing Calibration:
All criteria were within method requirements with any exceptions noted below.

Internal Standards:
All internal standards were within QC limits with any exceptions noted below.

Surrogates:
All surrogates were within QC limits with any exceptions noted below.

Method Blank:
All analytes were below the report limit in the method blank with any exceptions noted below.

Laboratory Control Spike:
All laboratory control spike compounds were within QC limits with any exceptions noted below.

Matrix Spikes:
All percent recoveries and relative percent differences (RPDs) were within acceptance criteria with any exceptions noted below.

Duplicate Sample:
All duplicate sample results were within method acceptance criteria with any exceptions noted below.

Additional Comments:

This data package has been reviewed for quality and completeness and is approved for release.

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ANALYTICAL RESULTS

Project: Black Pine Mine
Pace Project No.: 10163640

Sample: BP-CML-TS-04-00 **Lab ID: 10163640001** Collected: 07/15/11 11:05 Received: 07/17/11 19:19 Matrix: Solid

Results reported on a "dry-weight" basis

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
6020 MET ICPMS	Analytical Method: EPA 6020 Preparation Method: EPA 3050							
Antimony	**548**	mg/kg	60.4	2000	08/01/11 15:14	08/04/11 19:02	7440-36-0	
Arsenic	**390**	mg/kg	60.4	2000	08/01/11 15:14	08/04/11 19:02	7440-38-2	
Barium	**434**	mg/kg	0.36	20	08/01/11 15:14	08/04/11 18:58	7440-39-3	
Cadmium	**17.3**	mg/kg	0.097	20	08/01/11 15:14	08/04/11 18:58	7440-43-9	
Chromium	**9.8**	mg/kg	0.60	20	08/01/11 15:14	08/04/11 18:58	7440-47-3	
Copper	**3240**	mg/kg	60.4	2000	08/01/11 15:14	08/04/11 19:02	7440-50-8	
Iron	**17500**	mg/kg	60.4	20	08/01/11 15:14	08/04/11 18:58	7439-89-6	
Lead	**2460**	mg/kg	12.1	2000	08/01/11 15:14	08/04/11 19:02	7439-92-1	
Manganese	**143**	mg/kg	0.60	20	08/01/11 15:14	08/04/11 18:58	7439-96-5	
Nickel	**6.0**	mg/kg	0.60	20	08/01/11 15:14	08/04/11 18:58	7440-02-0	
Silver	**48.7**	mg/kg	0.60	20	08/01/11 15:14	08/04/11 18:58	7440-22-4	
Zinc	**278**	mg/kg	6.0	20	08/01/11 15:14	08/04/11 18:58	7440-66-6	
7471 Mercury	Analytical Method: EPA 7471 Preparation Method: EPA 7471							
Mercury	**0.24**	mg/kg	0.025	1	07/28/11 16:35	07/31/11 11:54	7439-97-6	
Dry Weight	Analytical Method: % Moisture							
Percent Moisture	**21.2**	%	0.10	1		07/21/11 16:45		

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ANALYTICAL RESULTS

Project: Black Pine Mine
Pace Project No.: 10163640

Sample: BP-CML-TS-04-02 **Lab ID: 10163640002** Collected: 07/15/11 11:07 Received: 07/17/11 19:19 Matrix: Solid

Results reported on a "dry-weight" basis

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
6020 MET ICPMS	Analytical Method: EPA 6020 Preparation Method: EPA 3050							
Antimony	**52.2**	mg/kg	0.61	20	08/01/11 15:14	08/04/11 19:19	7440-36-0	
Arsenic	**50.6**	mg/kg	0.61	20	08/01/11 15:14	08/04/11 19:19	7440-38-2	
Barium	**289**	mg/kg	0.37	20	08/01/11 15:14	08/04/11 19:19	7440-39-3	
Cadmium	**7.1**	mg/kg	0.098	20	08/01/11 15:14	08/04/11 19:19	7440-43-9	
Chromium	**11.8**	mg/kg	0.61	20	08/01/11 15:14	08/04/11 19:19	7440-47-3	
Copper	**846**	mg/kg	61.3	2000	08/01/11 15:14	08/04/11 19:23	7440-50-8	
Iron	**19000**	mg/kg	61.3	20	08/01/11 15:14	08/04/11 19:19	7439-89-6	
Lead	**181**	mg/kg	0.12	20	08/01/11 15:14	08/04/11 19:19	7439-92-1	
Manganese	**298**	mg/kg	0.61	20	08/01/11 15:14	08/04/11 19:19	7439-96-5	
Nickel	**8.5**	mg/kg	0.61	20	08/01/11 15:14	08/04/11 19:19	7440-02-0	
Silver	**4.2**	mg/kg	0.61	20	08/01/11 15:14	08/04/11 19:19	7440-22-4	
Zinc	**139**	mg/kg	6.1	20	08/01/11 15:14	08/04/11 19:19	7440-66-6	
7471 Mercury	Analytical Method: EPA 7471 Preparation Method: EPA 7471							
Mercury	**13.1**	mg/kg	0.63	25	07/28/11 16:35	07/31/11 10:01	7439-97-6	
Dry Weight	Analytical Method: % Moisture							
Percent Moisture	**20.8**	%	0.10	1		07/21/11 16:45		
Sobek Acid Base Potential	Analytical Method: Modified Sobek 3.2							
Neutralization Potential	**1.2**	tons/1000	0.50	1		08/01/11 00:00		
Sobek Extractable Sulfur	Analytical Method: Modified Sobek 3.2							
Sulfur, HCl Extractable	**<0.050**	% (w/w)	0.050	1		08/09/11 08:10		
Sulfur, HNO3 Extractable	**<0.050**	% (w/w)	0.050	1		08/09/11 08:10		
Sulfur, Hot Water Extractable	**<0.050**	% (w/w)	0.050	1		08/09/11 08:10		
Sulfur, Residual	**<0.050**	% (w/w)	0.050	1		08/09/11 08:10		
Total Sulfur	**<0.050**	% (w/w)	0.050	1		08/09/11 08:10		
Sobek Calculations	Analytical Method: Modified Sobek 3.2							
Acid/Base Potential	**1.2**	tons/1000		1		08/01/11 00:00		
Acid Potential	**<4.3**	tons/1000	4.3	1		08/01/11 00:00		
Lime Requirement	**11**	tons/1000	5.4	1		08/01/11 00:00		
SMP Lime Requirement	**8.1**	tons/1000	0.0	1		08/01/11 00:00		
Sobek SMP Buffer pH	Analytical Method: Modified Sobek 3.2							
SMP Buffer pH	**5.8**	Std. Units	0.10	1		07/29/11 13:24		

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ANALYTICAL RESULTS

Project: Black Pine Mine
Pace Project No.: 10163640

Sample: BP-CML-SS-04-06 **Lab ID: 10163640003** Collected: 07/15/11 11:10 Received: 07/17/11 19:19 Matrix: Solid

Results reported on a "dry-weight" basis

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
6020 MET ICPMS	Analytical Method: EPA 6020 Preparation Method: EPA 3050							
Antimony	**164**	mg/kg	0.63	20	08/01/11 15:14	08/04/11 19:27	7440-36-0	
Arsenic	**121**	mg/kg	0.63	20	08/01/11 15:14	08/04/11 19:27	7440-38-2	
Barium	**286**	mg/kg	0.38	20	08/01/11 15:14	08/04/11 19:27	7440-39-3	
Cadmium	**9.6**	mg/kg	0.10	20	08/01/11 15:14	08/04/11 19:27	7440-43-9	
Chromium	**9.5**	mg/kg	0.63	20	08/01/11 15:14	08/04/11 19:27	7440-47-3	
Copper	**1230**	mg/kg	62.6	2000	08/01/11 15:14	08/04/11 19:32	7440-50-8	
Iron	**10700**	mg/kg	62.6	20	08/01/11 15:14	08/04/11 19:27	7439-89-6	
Lead	**393**	mg/kg	12.5	2000	08/01/11 15:14	08/04/11 19:32	7439-92-1	
Manganese	**359**	mg/kg	0.63	20	08/01/11 15:14	08/04/11 19:27	7439-96-5	
Nickel	**9.2**	mg/kg	0.63	20	08/01/11 15:14	08/04/11 19:27	7440-02-0	
Silver	**10.1**	mg/kg	0.63	20	08/01/11 15:14	08/04/11 19:27	7440-22-4	
Zinc	**208**	mg/kg	6.3	20	08/01/11 15:14	08/04/11 19:27	7440-66-6	
7471 Mercury	Analytical Method: EPA 7471 Preparation Method: EPA 7471							
Mercury	**81.1**	mg/kg	6.2	250	07/28/11 16:35	07/31/11 10:09	7439-97-6	
Dry Weight	Analytical Method: % Moisture							
Percent Moisture	**24.6**	%	0.10	1		07/25/11 00:00		

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ANALYTICAL RESULTS

Project: Black Pine Mine
Pace Project No.: 10163640

Sample: BP-CML-TS-05-00 **Lab ID: 10163640004** Collected: 07/15/11 11:33 Received: 07/17/11 19:19 Matrix: Solid

Results reported on a "dry-weight" basis

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
6020 MET ICPMS	Analytical Method: EPA 6020 Preparation Method: EPA 3050							
Antimony	**409**	mg/kg	0.62	20	08/01/11 15:14	08/04/11 19:36	7440-36-0	
Arsenic	**353**	mg/kg	0.62	20	08/01/11 15:14	08/04/11 19:36	7440-38-2	
Barium	**421**	mg/kg	0.37	20	08/01/11 15:14	08/04/11 19:36	7440-39-3	
Cadmium	**13.6**	mg/kg	0.099	20	08/01/11 15:14	08/04/11 19:36	7440-43-9	
Chromium	**11.5**	mg/kg	0.62	20	08/01/11 15:14	08/04/11 19:36	7440-47-3	
Copper	**2020**	mg/kg	62.1	2000	08/01/11 15:14	08/04/11 19:40	7440-50-8	
Iron	**17300**	mg/kg	62.1	20	08/01/11 15:14	08/04/11 19:36	7439-89-6	
Lead	**1840**	mg/kg	12.4	2000	08/01/11 15:14	08/04/11 19:40	7439-92-1	
Manganese	**418**	mg/kg	0.62	20	08/01/11 15:14	08/04/11 19:36	7439-96-5	
Nickel	**8.2**	mg/kg	0.62	20	08/01/11 15:14	08/04/11 19:36	7440-02-0	
Silver	**28.4**	mg/kg	0.62	20	08/01/11 15:14	08/04/11 19:36	7440-22-4	
Zinc	**311**	mg/kg	6.2	20	08/01/11 15:14	08/04/11 19:36	7440-66-6	
7471 Mercury	Analytical Method: EPA 7471 Preparation Method: EPA 7471							
Mercury	**0.80**	mg/kg	0.65	25	07/28/11 16:35	07/31/11 10:16	7439-97-6	
Dry Weight	Analytical Method: % Moisture							
Percent Moisture	**23.3**	%	0.10	1		07/25/11 00:00		

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ANALYTICAL RESULTS

Project: Black Pine Mine
Pace Project No.: 10163640

Sample: BP-CML-TS-05-02 **Lab ID: 10163640005** Collected: 07/15/11 11:35 Received: 07/17/11 19:19 Matrix: Solid

Results reported on a "dry-weight" basis

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
6020 MET ICPMS	Analytical Method: EPA 6020 Preparation Method: EPA 3050							
Antimony	**1190**	mg/kg	24.9	1000	07/22/11 13:36	07/23/11 20:12	7440-36-0	
Arsenic	**1020**	mg/kg	24.9	1000	07/22/11 13:36	07/23/11 20:12	7440-38-2	
Barium	**615**	mg/kg	0.75	50	07/22/11 13:36	07/23/11 19:45	7440-39-3	
Cadmium	**21.0**	mg/kg	0.080	20	07/22/11 13:36	07/23/11 01:28	7440-43-9	
Chromium	**4.9**	mg/kg	0.50	20	07/22/11 13:36	07/23/11 01:28	7440-47-3	
Copper	**3690**	mg/kg	24.9	1000	07/22/11 13:36	07/23/11 20:12	7440-50-8	
Iron	**20600**	mg/kg	49.8	20	07/22/11 13:36	07/23/11 01:28	7439-89-6	
Lead	**10000**	mg/kg	5.0	1000	07/22/11 13:36	07/26/11 20:59	7439-92-1	
Manganese	**172**	mg/kg	0.50	20	07/22/11 13:36	07/23/11 01:28	7439-96-5	
Nickel	**2.7**	mg/kg	0.50	20	07/22/11 13:36	07/23/11 01:28	7440-02-0	
Silver	**79.9**	mg/kg	1.2	50	07/22/11 13:36	07/23/11 19:45	7440-22-4	
Zinc	**654**	mg/kg	12.4	50	07/22/11 13:36	07/23/11 19:45	7440-66-6	
7471 Mercury	Analytical Method: EPA 7471 Preparation Method: EPA 7471							
Mercury	**2.5**	mg/kg	0.63	25	07/28/11 16:35	07/31/11 10:18	7439-97-6	
Dry Weight	Analytical Method: % Moisture							
Percent Moisture	**23.3**	%	0.10	1		07/25/11 00:00		
Sobek Acid Base Potential	Analytical Method: Modified Sobek 3.2							
Neutralization Potential	**<0.5**	tons/1000	0.50	1		08/01/11 00:00		
Sobek Extractable Sulfur	Analytical Method: Modified Sobek 3.2							
Sulfur, HCl Extractable	**<0.050**	% (w/w)	0.050	1		08/09/11 08:21		
Sulfur, HNO3 Extractable	**0.0507**	% (w/w)	0.050	1		08/09/11 08:21		
Sulfur, Hot Water Extractable	**0.106**	% (w/w)	0.050	1		08/09/11 08:21		
Sulfur, Residual	**<0.050**	% (w/w)	0.050	1		08/09/11 08:21		
Total Sulfur	**0.155**	% (w/w)	0.050	1		08/09/11 08:21		
Sobek Calculations	Analytical Method: Modified Sobek 3.2							
Acid/Base Potential	**-1.6**	tons/1000		1		08/01/11 00:00		
Acid Potential	**1.6**	tons/1000	4.3	1		08/01/11 00:00		
Lime Requirement	**5.0**	tons/1000	5.4	1		08/01/11 00:00		
SMP Lime Requirement	**2.4**	tons/1000	0.0	1		08/01/11 00:00		
Sobek SMP Buffer pH	Analytical Method: Modified Sobek 3.2							
SMP Buffer pH	**6.6**	Std. Units	0.10	1		07/29/11 13:24		

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ANALYTICAL RESULTS

Project: Black Pine Mine
Pace Project No.: 10163640

Sample: BP-CML-SS-05-04 **Lab ID: 10163640006** Collected: 07/15/11 11:40 Received: 07/17/11 19:19 Matrix: Solid

Results reported on a "dry-weight" basis

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
6020 MET ICPMS	Analytical Method: EPA 6020 Preparation Method: EPA 3050							
Antimony	**1260**	mg/kg	1.4	50	07/22/11 13:36	07/23/11 20:09	7440-36-0	
Arsenic	**1030**	mg/kg	1.4	50	07/22/11 13:36	07/23/11 20:09	7440-38-2	
Barium	**495**	mg/kg	0.34	20	07/22/11 13:36	07/23/11 01:31	7440-39-3	
Cadmium	**23.1**	mg/kg	0.092	20	07/22/11 13:36	07/23/11 01:31	7440-43-9	
Chromium	**4.8**	mg/kg	0.57	20	07/22/11 13:36	07/23/11 01:31	7440-47-3	
Copper	**5600**	mg/kg	28.6	1000	07/22/11 13:36	07/23/11 20:16	7440-50-8	
Iron	**18900**	mg/kg	57.2	20	07/22/11 13:36	07/23/11 01:31	7439-89-6	
Lead	**8010**	mg/kg	5.7	1000	07/22/11 13:36	07/26/11 21:03	7439-92-1	
Manganese	**155**	mg/kg	0.57	20	07/22/11 13:36	07/23/11 01:31	7439-96-5	
Nickel	**3.0**	mg/kg	0.57	20	07/22/11 13:36	07/23/11 01:31	7440-02-0	
Silver	**101**	mg/kg	1.4	50	07/22/11 13:36	07/23/11 20:09	7440-22-4	
Zinc	**371**	mg/kg	5.7	20	07/22/11 13:36	07/23/11 01:31	7440-66-6	
7471 Mercury	Analytical Method: EPA 7471 Preparation Method: EPA 7471							
Mercury	**24.7**	mg/kg	0.66	25	07/28/11 16:35	07/31/11 10:20	7439-97-6	
Dry Weight	Analytical Method: % Moisture							
Percent Moisture	**36.7**	%	0.10	1		07/25/11 00:00		

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ANALYTICAL RESULTS

Project: Black Pine Mine
Pace Project No.: 10163640

Sample: BP-CML-TS-06-00 **Lab ID: 10163640007** Collected: 07/15/11 12:10 Received: 07/17/11 19:19 Matrix: Solid

Results reported on a "dry-weight" basis

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
6020 MET ICPMS	Analytical Method: EPA 6020 Preparation Method: EPA 3050							
Antimony	**1040**	mg/kg	20.9	1000	07/22/11 13:36	07/23/11 20:22	7440-36-0	
Arsenic	**830**	mg/kg	1.0	50	07/22/11 13:36	07/23/11 20:19	7440-38-2	
Barium	**463**	mg/kg	0.63	50	07/22/11 13:36	07/23/11 20:19	7440-39-3	
Cadmium	**30.7**	mg/kg	0.067	20	07/22/11 13:36	07/23/11 01:35	7440-43-9	
Chromium	**5.8**	mg/kg	0.42	20	07/22/11 13:36	07/23/11 01:35	7440-47-3	
Copper	**1740**	mg/kg	20.9	1000	07/22/11 13:36	07/23/11 20:22	7440-50-8	
Iron	**15600**	mg/kg	41.9	20	07/22/11 13:36	07/23/11 01:35	7439-89-6	
Lead	**6790**	mg/kg	4.2	1000	07/22/11 13:36	07/26/11 21:06	7439-92-1	
Manganese	**190**	mg/kg	0.42	20	07/22/11 13:36	07/23/11 01:35	7439-96-5	
Nickel	**4.1**	mg/kg	0.42	20	07/22/11 13:36	07/23/11 01:35	7440-02-0	
Silver	**128**	mg/kg	1.0	50	07/22/11 13:36	07/23/11 20:19	7440-22-4	
Zinc	**220**	mg/kg	4.2	20	07/22/11 13:36	07/23/11 01:35	7440-66-6	
7471 Mercury	Analytical Method: EPA 7471 Preparation Method: EPA 7471							
Mercury	**0.40**	mg/kg	0.025	1	07/28/11 16:35	07/31/11 11:56	7439-97-6	
Dry Weight	Analytical Method: % Moisture							
Percent Moisture	**19.8**	%	0.10	1		07/25/11 00:00		

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ANALYTICAL RESULTS

Project: Black Pine Mine
Pace Project No.: 10163640

Sample: BP-CML-TS-06-02 **Lab ID: 10163640008** Collected: 07/15/11 12:13 Received: 07/17/11 19:19 Matrix: Solid

Results reported on a "dry-weight" basis

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
6020 MET ICPMS	Analytical Method: EPA 6020 Preparation Method: EPA 3050							
Antimony	**1410**	mg/kg	26.9	1000	07/22/11 13:36	07/23/11 20:29	7440-36-0	
Arsenic	**1070**	mg/kg	1.3	50	07/22/11 13:36	07/23/11 20:26	7440-38-2	
Barium	**397**	mg/kg	0.32	20	07/22/11 13:36	07/23/11 01:38	7440-39-3	
Cadmium	**22.0**	mg/kg	0.086	20	07/22/11 13:36	07/23/11 01:38	7440-43-9	
Chromium	**4.1**	mg/kg	0.54	20	07/22/11 13:36	07/23/11 01:38	7440-47-3	
Copper	**4040**	mg/kg	26.9	1000	07/22/11 13:36	07/23/11 20:29	7440-50-8	
Iron	**22600**	mg/kg	53.9	20	07/22/11 13:36	07/23/11 01:38	7439-89-6	
Lead	**6960**	mg/kg	5.4	1000	07/22/11 13:36	07/26/11 21:09	7439-92-1	
Manganese	**246**	mg/kg	0.54	20	07/22/11 13:36	07/23/11 01:38	7439-96-5	
Nickel	**2.4**	mg/kg	0.54	20	07/22/11 13:36	07/23/11 01:38	7440-02-0	
Silver	**99.9**	mg/kg	1.3	50	07/22/11 13:36	07/23/11 20:26	7440-22-4	
Zinc	**334**	mg/kg	5.4	20	07/22/11 13:36	07/23/11 01:38	7440-66-6	
7471 Mercury	Analytical Method: EPA 7471 Preparation Method: EPA 7471							
Mercury	**46.1**	mg/kg	5.1	250	07/28/11 16:35	07/31/11 10:29	7439-97-6	
Dry Weight	Analytical Method: % Moisture							
Percent Moisture	**16.4**	%	0.10	1		07/25/11 00:00		
Sobek Acid Base Potential	Analytical Method: Modified Sobek 3.2							
Neutralization Potential	**2.4**	tons/1000	0.50	1		08/01/11 00:00		
Sobek Extractable Sulfur	Analytical Method: Modified Sobek 3.2							
Sulfur, HCl Extractable	**<0.050**	% (w/w)	0.050	1		08/09/11 08:40		
Sulfur, HNO3 Extractable	**<0.050**	% (w/w)	0.050	1		08/09/11 08:40		
Sulfur, Hot Water Extractable	**<0.050**	% (w/w)	0.050	1		08/09/11 08:40		
Sulfur, Residual	**<0.050**	% (w/w)	0.050	1		08/09/11 08:40		
Total Sulfur	**0.0970**	% (w/w)	0.050	1		08/09/11 08:40		
Sobek Calculations	Analytical Method: Modified Sobek 3.2							
Acid/Base Potential	**2.4**	tons/1000		1		08/01/11 00:00		
Acid Potential	**<4.3**	tons/1000	4.3	1		08/01/11 00:00		
Lime Requirement	**<5.4**	tons/1000	5.4	1		08/01/11 00:00		
SMP Lime Requirement	**0**	tons/1000	0.0	1		08/01/11 00:00		
Sobek SMP Buffer pH	Analytical Method: Modified Sobek 3.2							
SMP Buffer pH	**7.3**	Std. Units	0.10	1		07/29/11 13:24		

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ANALYTICAL RESULTS

Project: Black Pine Mine
Pace Project No.: 10163640

Sample: BP-CML-SS-06-05 **Lab ID: 10163640009** Collected: 07/15/11 12:15 Received: 07/17/11 19:19 Matrix: Solid

Results reported on a "dry-weight" basis

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
6020 MET ICPMS	Analytical Method: EPA 6020 Preparation Method: EPA 3050							
Antimony	**19.2**	mg/kg	0.86	20	07/22/11 13:36	07/23/11 01:41	7440-36-0	
Arsenic	**176**	mg/kg	0.86	20	07/22/11 13:36	07/23/11 01:41	7440-38-2	
Barium	**427**	mg/kg	0.52	20	07/22/11 13:36	07/23/11 01:41	7440-39-3	
Cadmium	**63.1**	mg/kg	0.14	20	07/22/11 13:36	07/23/11 01:41	7440-43-9	
Chromium	**22.6**	mg/kg	0.86	20	07/22/11 13:36	07/23/11 01:41	7440-47-3	
Copper	**367**	mg/kg	0.86	20	07/22/11 13:36	07/23/11 01:41	7440-50-8	
Iron	**14600**	mg/kg	86.0	20	07/22/11 13:36	07/23/11 01:41	7439-89-6	
Lead	**77.1**	mg/kg	0.17	20	07/22/11 13:36	07/23/11 01:41	7439-92-1	
Manganese	**165**	mg/kg	0.86	20	07/22/11 13:36	07/23/11 01:41	7439-96-5	
Nickel	**19.9**	mg/kg	0.86	20	07/22/11 13:36	07/23/11 01:41	7440-02-0	
Silver	**3.7**	mg/kg	2.1	50	07/22/11 13:36	07/23/11 20:33	7440-22-4	
Zinc	**576**	mg/kg	8.6	20	07/22/11 13:36	07/23/11 01:41	7440-66-6	
7471 Mercury	Analytical Method: EPA 7471 Preparation Method: EPA 7471							
Mercury	**79.3**	mg/kg	7.9	250	07/28/11 16:35	07/31/11 10:36	7439-97-6	
Dry Weight	Analytical Method: % Moisture							
Percent Moisture	**42.4**	%	0.10	1		07/25/11 00:00		

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QUALITY CONTROL DATA

Project: Black Pine Mine
Pace Project No.: 10163640

QC Batch: MPRP/27167 Analysis Method: EPA 6020
QC Batch Method: EPA 3050 Analysis Description: 6020 MET
Associated Lab Samples: 10163640001, 10163640002, 10163640003, 10163640004

METHOD BLANK: 1014853 Matrix: Solid
Associated Lab Samples: 10163640001, 10163640002, 10163640003, 10163640004

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Antimony	mg/kg	<0.49	0.49	08/04/11 03:04	
Arsenic	mg/kg	<0.49	0.49	08/04/11 03:04	
Barium	mg/kg	<0.29	0.29	08/04/11 03:04	
Cadmium	mg/kg	<0.078	0.078	08/04/11 03:04	
Chromium	mg/kg	<0.49	0.49	08/04/11 03:04	
Copper	mg/kg	<0.49	0.49	08/04/11 03:04	
Iron	mg/kg	<49.0	49.0	08/04/11 03:04	
Lead	mg/kg	<0.098	0.098	08/04/11 03:04	
Manganese	mg/kg	<0.49	0.49	08/04/11 03:04	
Nickel	mg/kg	<0.49	0.49	08/04/11 03:04	
Silver	mg/kg	<0.49	0.49	08/04/11 03:04	
Zinc	mg/kg	<4.9	4.9	08/04/11 03:04	

LABORATORY CONTROL SAMPLE: 1014854

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Antimony	mg/kg	20	18.2	91	75-125	
Arsenic	mg/kg	20	18.3	92	75-125	
Barium	mg/kg	20	18.1	90	75-125	
Cadmium	mg/kg	20	18.4	92	75-125	
Chromium	mg/kg	20	18.8	94	75-125	
Copper	mg/kg	20	18.9	94	75-125	
Iron	mg/kg	250	233	93	75-125	
Lead	mg/kg	20	18.8	94	75-125	
Manganese	mg/kg	20	18.4	92	75-125	
Nickel	mg/kg	20	18.8	94	75-125	
Silver	mg/kg	20	20.4	102	75-125	
Zinc	mg/kg	20	18.8	94	75-125	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 1014855 1014856

Parameter	Units	10163483007 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Antimony	mg/kg	219	21.7	21.7	178	148	-190	-328	75-125	18	20	M6
Arsenic	mg/kg	118	21.7	21.7	202	156	386	173	75-125	26	20	D6,M6
Barium	mg/kg	49.3	21.7	21.7	115	113	302	293	75-125	2	20	M6
Cadmium	mg/kg	0.12	21.7	21.7	54.2	53.7	249	246	75-125	.9	20	M6
Chromium	mg/kg	5.4	21.7	21.7	61.4	62.0	258	260	75-125	1	20	M6
Copper	mg/kg	31.3	21.7	21.7	88.5	89.2	263	266	75-125	.8	20	M6
Iron	mg/kg	17000	272	272	15300	15900	-622	-408	75-125	4	20	M6

REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL DATA

Project: Black Pine Mine
Pace Project No.: 10163640

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 1014855 1014856

Parameter	Units	10163483007 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Lead	mg/kg	162	21.7	21.7	230	269	311	490	75-125	16	20	M6
Manganese	mg/kg	67.6	21.7	21.7	169	115	467	220	75-125	38	20	D6,M6
Nickel	mg/kg	4.9	21.7	21.7	57.6	57.7	243	243	75-125	.04	20	M6
Silver	mg/kg	13.5	21.7	21.7	39.6	38.2	120	114	75-125	3	20	
Zinc	mg/kg	18.6	21.7	21.7	76.5	80.9	266	287	75-125	6	20	M6

MATRIX SPIKE SAMPLE: 1014857

Parameter	Units	10163634007 Result	Spike Conc.	MS Result	MS % Rec	% Rec Limits	Qualifiers
Antimony	mg/kg	3.3	19.6	41.0	192	75-125	M6
Arsenic	mg/kg	14.4	19.6	69.2	279	75-125	M6
Barium	mg/kg	64.7	19.6	230	841	75-125	M6
Cadmium	mg/kg	1.6	19.6	59.5	295	75-125	M6
Chromium	mg/kg	7.6	19.6	69.5	316	75-125	M6
Copper	mg/kg	220	19.6	263	220	75-125	M6
Iron	mg/kg	11000	245	13400	1010	75-125	M6
Lead	mg/kg	24.4	19.6	96.1	365	75-125	M6
Manganese	mg/kg	419	19.6	838	2130	75-125	M6
Nickel	mg/kg	4.8	19.6	62.7	295	75-125	M6
Silver	mg/kg	<0.60	19.6	28.8	144	75-125	M6
Zinc	mg/kg	101	19.6	169	345	75-125	M6

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QUALITY CONTROL DATA

Project: Black Pine Mine
Pace Project No.: 10163640

QC Batch: MPRP/27235 Analysis Method: EPA 6020
QC Batch Method: EPA 3050 Analysis Description: 6020 MET
Associated Lab Samples: 10163640005, 10163640006, 10163640007, 10163640008, 10163640009

METHOD BLANK: 1017005 Matrix: Solid
Associated Lab Samples: 10163640005, 10163640006, 10163640007, 10163640008, 10163640009

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Antimony	mg/kg	<0.49	0.49	07/23/11 00:44	
Arsenic	mg/kg	<0.49	0.49	07/23/11 00:44	
Barium	mg/kg	<0.29	0.29	07/23/11 00:44	
Cadmium	mg/kg	<0.078	0.078	07/23/11 00:44	
Chromium	mg/kg	<0.49	0.49	07/23/11 00:44	
Copper	mg/kg	<0.49	0.49	07/23/11 00:44	
Iron	mg/kg	<49.0	49.0	07/23/11 00:44	
Lead	mg/kg	<0.098	0.098	07/23/11 00:44	
Manganese	mg/kg	<0.49	0.49	07/23/11 00:44	
Nickel	mg/kg	<0.49	0.49	07/23/11 00:44	
Silver	mg/kg	<0.49	0.49	07/23/11 00:44	
Zinc	mg/kg	<4.9	4.9	07/23/11 00:44	

LABORATORY CONTROL SAMPLE: 1017006

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Antimony	mg/kg	16.7	15.8	95	75-125	
Arsenic	mg/kg	16.7	16.4	98	75-125	
Barium	mg/kg	16.7	17.3	104	75-125	
Cadmium	mg/kg	16.7	17.8	107	75-125	
Chromium	mg/kg	16.7	18.9	113	75-125	
Copper	mg/kg	16.7	18.7	112	75-125	
Iron	mg/kg	208	243	117	75-125	
Lead	mg/kg	16.7	19.6	118	75-125	
Manganese	mg/kg	16.7	17.9	108	75-125	
Nickel	mg/kg	16.7	19.5	117	75-125	
Silver	mg/kg	16.7	16.2	97	75-125	
Zinc	mg/kg	16.7	18.8	113	75-125	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 1017007 1017008

Parameter	Units	10163982001 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Antimony	mg/kg	59.0	17.1	20.6	74.1	85.5	88	129	75-125	14	20	M6
Arsenic	mg/kg	35.6	17.1	20.6	49.7	59.7	82	117	75-125	18	20	
Barium	mg/kg	78.6	17.1	20.6	96.1	109	102	148	75-125	13	20	M6
Cadmium	mg/kg	2.7	17.1	20.6	17.3	22.3	85	95	75-125	25	20	D6
Chromium	mg/kg	8.7	17.1	20.6	23.8	30.5	88	106	75-125	25	20	D6
Copper	mg/kg	182	17.1	20.6	216	236	197	262	75-125	9	20	M6
Iron	mg/kg	65100	214	257	62600	71100	-1140	2340	75-125	13	20	M6

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QUALITY CONTROL DATA

Project: Black Pine Mine
Pace Project No.: 10163640

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 1017007 1017008

Parameter	Units	10163982001 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Lead	mg/kg	13800	17.1	20.6	11600	13200	-13000	-3080	75-125	13	20	M6
Manganese	mg/kg	1750	17.1	20.6	1910	2240	928	2420	75-125	16	20	M6
Nickel	mg/kg	7.4	17.1	20.6	20.4	26.9	76	95	75-125	28	20	D6
Silver	mg/kg	43.3	17.1	20.6	74.4	68.2	182	121	75-125	9	20	M6
Zinc	mg/kg	967	17.1	20.6	936	917	-181	-243	75-125	2	20	M6

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QUALITY CONTROL DATA

Project: Black Pine Mine
Pace Project No.: 10163640

QC Batch: MERP/5650 Analysis Method: EPA 7471
QC Batch Method: EPA 7471 Analysis Description: 7471 Mercury
Associated Lab Samples: 10163640001, 10163640002, 10163640003, 10163640004, 10163640005, 10163640006, 10163640007, 10163640008, 10163640009

METHOD BLANK: 1016607 Matrix: Solid
Associated Lab Samples: 10163640001, 10163640002, 10163640003, 10163640004, 10163640005, 10163640006, 10163640007, 10163640008, 10163640009

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Mercury	mg/kg	<0.020	0.020	07/31/11 09:25	

LABORATORY CONTROL SAMPLE: 1016608

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Mercury	mg/kg	.44	0.45	103	80-120	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 1016609 1016610

Parameter	Units	10163634009 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Mercury	mg/kg	0.12	.45	.54	0.23	0.31	25	35	80-120	27	20	D6,M1

MATRIX SPIKE SAMPLE: 1016611

Parameter	Units	10163643009 Result	Spike Conc.	MS Result	MS % Rec	% Rec Limits	Qualifiers
Mercury	mg/kg	137	.6	137	14	80-120	M6

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QUALITY CONTROL DATA

Project: Black Pine Mine
Pace Project No.: 10163640

QC Batch: MPRP/27259
QC Batch Method: % Moisture
Analysis Method: % Moisture
Analysis Description: Dry Weight/Percent Moisture
Associated Lab Samples: 10163640001, 10163640002

SAMPLE DUPLICATE: 1017674

Parameter	Units	10164076001 Result	Dup Result	RPD	Max RPD	Qualifiers
Percent Moisture	%	8.0	8.4	5	30	

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QUALITY CONTROL DATA

Project: Black Pine Mine
Pace Project No.: 10163640

QC Batch: MPRP/27293 Analysis Method: % Moisture
QC Batch Method: % Moisture Analysis Description: Dry Weight/Percent Moisture
Associated Lab Samples: 10163640003, 10163640004, 10163640005, 10163640006, 10163640007, 10163640008, 10163640009

SAMPLE DUPLICATE: 1019403

Parameter	Units	10163634006 Result	Dup Result	RPD	Max RPD	Qualifiers
Percent Moisture	%	10.3	11.1	7	30	

SAMPLE DUPLICATE: 1019404

Parameter	Units	10163643008 Result	Dup Result	RPD	Max RPD	Qualifiers
Percent Moisture	%	18.6	18.3	2	30	

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QUALITY CONTROL DATA

Project: Black Pine Mine
Pace Project No.: 10163640

QC Batch: MT/6497 Analysis Method: Modified Sobek 3.2
QC Batch Method: Modified Sobek 3.2 Analysis Description: Sobek Acid Base Potential
Associated Lab Samples: 10163640002, 10163640005, 10163640008

METHOD BLANK: 1020551 Matrix: Solid
Associated Lab Samples: 10163640002, 10163640005, 10163640008

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Neutralization Potential	tons/1000	<0.5	0.50	08/01/11 00:00	

SAMPLE DUPLICATE: 1020552

Parameter	Units	10163634001 Result	Dup Result	RPD	Max RPD	Qualifiers
Neutralization Potential	tons/1000	0.73	2.2			

SAMPLE DUPLICATE: 1024994

Parameter	Units	10163640008 Result	Dup Result	RPD	Max RPD	Qualifiers
Neutralization Potential	tons/1000	2.4	5.6			

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QUALITY CONTROL DATA

Project: Black Pine Mine
Pace Project No.: 10163640

QC Batch: MT/6488 Analysis Method: Modified Sobek 3.2
QC Batch Method: Modified Sobek 3.2 Analysis Description: Sobek Extractable Sulfur
Associated Lab Samples: 10163640002, 10163640005, 10163640008

METHOD BLANK: 1019974 Matrix: Solid
Associated Lab Samples: 10163640002, 10163640005, 10163640008

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Total Sulfur	% (w/w)	<0.050	0.050	08/08/11 14:36	

SAMPLE DUPLICATE: 1019976

Parameter	Units	10163634001 Result	Dup Result	RPD	Max RPD	Qualifiers
Total Sulfur	% (w/w)	<0.050	<0.050			

SAMPLE DUPLICATE: 1019977

Parameter	Units	10163643005 Result	Dup Result	RPD	Max RPD	Qualifiers
Total Sulfur	% (w/w)	0.0605	0.0697	14		

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QUALITY CONTROL DATA

Project: Black Pine Mine
Pace Project No.: 10163640

QC Batch: MT/6543 Analysis Method: Modified Sobek 3.2
QC Batch Method: Modified Sobek 3.2 Analysis Description: Sobek SMP Buffer pH
Associated Lab Samples: 10163640002, 10163640005, 10163640008

SAMPLE DUPLICATE: 1022818

Parameter	Units	10163634001 Result	Dup Result	RPD	Max RPD	Qualifiers
SMP Buffer pH	Std. Units	7.3	7.2	.3	20	

SAMPLE DUPLICATE: 1026468

Parameter	Units	10163643005 Result	Dup Result	RPD	Max RPD	Qualifiers
SMP Buffer pH	Std. Units	7.1	7.1	.3	20	

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QUALIFIERS

Project: Black Pine Mine
Pace Project No.: 10163640

DEFINITIONS

DF - Dilution Factor, if reported, represents the factor applied to the reported data due to changes in sample preparation, dilution of the sample aliquot, or moisture content.

ND - Not Detected at or above adjusted reporting limit.

J - Estimated concentration above the adjusted method detection limit and below the adjusted reporting limit.

MDL - Adjusted Method Detection Limit.

S - Surrogate

1,2-Diphenylhydrazine (8270 listed analyte) decomposes to Azobenzene.

Consistent with EPA guidelines, unrounded data are displayed and have been used to calculate % recovery and RPD values.

LCS(D) - Laboratory Control Sample (Duplicate)

MS(D) - Matrix Spike (Duplicate)

DUP - Sample Duplicate

RPD - Relative Percent Difference

NC - Not Calculable.

SG - Silica Gel - Clean-Up

U - Indicates the compound was analyzed for, but not detected.

N-Nitrosodiphenylamine decomposes and cannot be separated from Diphenylamine using Method 8270. The result reported for each analyte is a combined concentration.

LABORATORIES

PASI-M	Pace Analytical Services - Minneapolis
PASI-MT	Pace Analytical Services - Montana

ANALYTE QUALIFIERS

D6	The relative percent difference (RPD) between the sample and sample duplicate exceeded laboratory control limits.
M1	Matrix spike recovery exceeded QC limits. Batch accepted based on laboratory control sample (LCS) recovery.
M6	Matrix spike and Matrix spike duplicate recovery not evaluated against control limits due to sample dilution.

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QUALITY CONTROL DATA CROSS REFERENCE TABLE

Project: Black Pine Mine
Pace Project No.: 10163640

Lab ID	Sample ID	QC Batch Method	QC Batch	Analytical Method	Analytical Batch
10163640001	**BP-CML-TS-04-00**	EPA 3050	MPRP/27167	EPA 6020	ICPM/11153
10163640002	**BP-CML-TS-04-02**	EPA 3050	MPRP/27167	EPA 6020	ICPM/11153
10163640003	**BP-CML-SS-04-06**	EPA 3050	MPRP/27167	EPA 6020	ICPM/11153
10163640004	**BP-CML-TS-05-00**	EPA 3050	MPRP/27167	EPA 6020	ICPM/11153
10163640005	**BP-CML-TS-05-02**	EPA 3050	MPRP/27235	EPA 6020	ICPM/11082
10163640006	**BP-CML-SS-05-04**	EPA 3050	MPRP/27235	EPA 6020	ICPM/11082
10163640007	**BP-CML-TS-06-00**	EPA 3050	MPRP/27235	EPA 6020	ICPM/11082
10163640008	**BP-CML-TS-06-02**	EPA 3050	MPRP/27235	EPA 6020	ICPM/11082
10163640009	**BP-CML-SS-06-05**	EPA 3050	MPRP/27235	EPA 6020	ICPM/11082
10163640001	**BP-CML-TS-04-00**	EPA 7471	MERP/5650	EPA 7471	MERC/6493
10163640002	**BP-CML-TS-04-02**	EPA 7471	MERP/5650	EPA 7471	MERC/6493
10163640003	**BP-CML-SS-04-06**	EPA 7471	MERP/5650	EPA 7471	MERC/6493
10163640004	**BP-CML-TS-05-00**	EPA 7471	MERP/5650	EPA 7471	MERC/6493
10163640005	**BP-CML-TS-05-02**	EPA 7471	MERP/5650	EPA 7471	MERC/6493
10163640006	**BP-CML-SS-05-04**	EPA 7471	MERP/5650	EPA 7471	MERC/6493
10163640007	**BP-CML-TS-06-00**	EPA 7471	MERP/5650	EPA 7471	MERC/6493
10163640008	**BP-CML-TS-06-02**	EPA 7471	MERP/5650	EPA 7471	MERC/6493
10163640009	**BP-CML-SS-06-05**	EPA 7471	MERP/5650	EPA 7471	MERC/6493
10163640001	**BP-CML-TS-04-00**	% Moisture	MPRP/27259		
10163640002	**BP-CML-TS-04-02**	% Moisture	MPRP/27259		
10163640003	**BP-CML-SS-04-06**	% Moisture	MPRP/27293		
10163640004	**BP-CML-TS-05-00**	% Moisture	MPRP/27293		
10163640005	**BP-CML-TS-05-02**	% Moisture	MPRP/27293		
10163640006	**BP-CML-SS-05-04**	% Moisture	MPRP/27293		
10163640007	**BP-CML-TS-06-00**	% Moisture	MPRP/27293		
10163640008	**BP-CML-TS-06-02**	% Moisture	MPRP/27293		
10163640009	**BP-CML-SS-06-05**	% Moisture	MPRP/27293		
10163640002	**BP-CML-TS-04-02**	Modified Sobek 3.2	MT/6497		
10163640005	**BP-CML-TS-05-02**	Modified Sobek 3.2	MT/6497		
10163640008	**BP-CML-TS-06-02**	Modified Sobek 3.2	MT/6497		
10163640002	**BP-CML-TS-04-02**	Modified Sobek 3.2	MT/6488		
10163640005	**BP-CML-TS-05-02**	Modified Sobek 3.2	MT/6488		
10163640008	**BP-CML-TS-06-02**	Modified Sobek 3.2	MT/6488		
10163640002	**BP-CML-TS-04-02**	Modified Sobek 3.2	MT/6501		
10163640005	**BP-CML-TS-05-02**	Modified Sobek 3.2	MT/6501		
10163640008	**BP-CML-TS-06-02**	Modified Sobek 3.2	MT/6501		
10163640002	**BP-CML-TS-04-02**	Modified Sobek 3.2	MT/6543		
10163640005	**BP-CML-TS-05-02**	Modified Sobek 3.2	MT/6543		
10163640008	**BP-CML-TS-06-02**	Modified Sobek 3.2	MT/6543		

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CHAIN-OF-CUSTODY / Analytical Request Document

The Chain-of-Custody is a LEGAL DOCUMENT. All relevant fields must be completed accurately.

Page: 1 of 1

1429909

Section A Required Client Information:

Company:	Herrera
Address:	
Email To:	
Phone:	Fax:
Requested Due Date/TAT:	

Section B Required Project Information:

Report To:	Kevin Hauck
Copy To:	
Purchase Order No.:	
Project Name:	Black Pine Mine
Project Number:	

Section C Invoice Information:

Attention:	
Company Name:	DEQ
Address:	
Pace Quote Reference:	
Pace Project Manager:	
Pace Profile #:	

REGULATORY AGENCY

☐ NPDES ☐ GROUND WATER ☐ DRINKING WATER
☐ UST ☐ RCRA ☐ OTHER _____

Site Location STATE: _____

Section D Required Client Information

SAMPLE ID (A-Z, 0-9 / ,-) Sample IDs MUST BE UNIQUE

Matrix Codes MATRIX / CODE

Drinking Water	DW
Water	WT
Waste Water	WW
Product	P
Soil/Solid	SL
Oil	OL
Wipe	WP
Air	AR
Tissue	TS
Other	OT

Requested Analysis Filtered (Y/N)

ITEM #	SAMPLE ID	MATRIX CODE (see valid codes to left)	SAMPLE TYPE (G=GRAB C=COMP)	COLLECTED COMPOSITE START DATE	COLLECTED COMPOSITE START TIME	COLLECTED COMPOSITE END/GRAB DATE	COLLECTED COMPOSITE END/GRAB TIME	SAMPLE TEMP AT COLLECTION	# OF CONTAINERS	Preservatives: Unpreserved	H_2SO_4	HNO_3	HCl	NaOH	$Na_2S_2O_3$	Methanol	Other	Y/N	Analysis Test: Tot. Rec. Mct.	ABA	Moisture Content	Residual Chlorine (Y/N)	Pace Project No./ Lab I.D.
1	BP-CML-TS-04-00	SL	G			7/15/11	1105		1	X									X		X		001
2	BP-CML-TS-04-02	↓	↓			↓	1107		2	X									X	X	X		002
3	BP-CML-SS-04-06	↓	↓			↓	1110		1	X									X				003
4	BP-CML-TS-05-00	SL	G			7/15/11	1133		1	X									X		X		004
5	BP-CML-TS-05-02	↓	↓			↓	1135		2	X									X	X	X		005
6	BP-CML-SS-05-04	↓	↓			↓	1140		1	X									X				006
7	BP-CML-TS-06-00	SL	G			7/15/11	1210		1	X									X		X		007
8	BP-CML-TS-06-02	↓	↓			↓	1213		2	X									X	X	X		008
9	BP-CML-SS-06-05	↓	↓			↓	1215		1	X									X				009
10																							
11																							
12																							

10163640

Pace Project No./ Lab I.D.

ADDITIONAL COMMENTS	RELINQUISHED BY / AFFILIATION	DATE	TIME	ACCEPTED BY / AFFILIATION	DATE	TIME	SAMPLE CONDITIONS			
	Fedex BU pickup (E)	7/16/11	1130	[signature] Pace	7/16/11	1130	5.4	Y	Y	Y

ORIGINAL

SAMPLER NAME AND SIGNATURE

PRINT Name of SAMPLER: ALEX SWENSEN

SIGNATURE of SAMPLER: [signature] DATE Signed (MM/DD/YY): 7/15/11

Temp in °C | Received on Ice (Y/N) | Custody Sealed Cooler (Y/N) | Samples Intact (Y/N)

*Important Note: By signing this form you are accepting Pace's NET 30 day payment terms and agreeing to late charges of 1.5% per month for any invoices not paid within 30 days.

F-ALL-Q-020rev.07, 15-May-2007

Sample Condition Upon Receipt

Pace Analytical

Client Name: MDEQ - BLACK PINE Project # 10163640

Courier: [X] Fed Ex [ ] UPS [ ] USPS [ ] Client [ ] Commercial [ ] Pace Other _____

Tracking #: 876249308789

Custody Seal on Cooler/Box Present: [X] yes [ ] no Seals intact: [X] yes [ ] no

Packing Material: [ ] Bubble Wrap [X] Bubble Bags [ ] None [ ] Other _____ Temp Blank: Yes [X] No [ ]

Thermometer Used 383045 or 135 Type of Ice: (Wet) Blue None [X] Samples on ice, cooling process has begun

Cooler Temperature 5.8° Biological Tissue is Frozen: Yes No

Temp should be above freezing to 6°C

Date and Initials of person examining contents: NCT 7/17/14

Comments:

Chain of Custody Present:	[X]Yes [ ]No [ ]N/A	1.
Chain of Custody Filled Out:	[X]Yes [ ]No [ ]N/A	2.
Chain of Custody Relinquished:	[X]Yes [ ]No [ ]N/A	3.
Sampler Name & Signature on COC:	[X]Yes [ ]No [ ]N/A	4.
Samples Arrived within Hold Time:	[X]Yes [ ]No [ ]N/A	5.
Short Hold Time Analysis (<72hr):	[ ]Yes [X]No [ ]N/A	6.
Rush Turn Around Time Requested:	[ ]Yes [X]No [ ]N/A	7.
Sufficient Volume:	[X]Yes [ ]No [ ]N/A	8.
Correct Containers Used:	[X]Yes [ ]No [ ]N/A	9.
-Pace Containers Used:	[X]Yes [ ]No [ ]N/A	
Containers Intact:	[X]Yes [ ]No [ ]N/A	10.
Filtered volume received for Dissolved tests	[ ]Yes [ ]No [X]N/A	11.
Sample Labels match COC:	[X]Yes [ ]No [ ]N/A	12.
-Includes date/time/ID/Analysis Matrix: SOIL		
All containers needing acid/base preservation have been checked. Noncompliance are noted in 13.	[ ]Yes [ ]No [X]N/A	13. [ ] HNO3 [ ] H2SO4 [ ] NaOH [ ] HCl
All containers needing preservation are found to be in compliance with EPA recommendation.	[ ]Yes [ ]No [X]N/A	Samp #
Exceptions: VOA,Coliform, TOC, Oil and Grease, WI-DRO (water)	[ ]Yes [X]No	Initial when completed / Lot # of added preservative
Samples checked for dechlorination:	[ ]Yes [ ]No [X]N/A	14.
Headspace in VOA Vials (>6mm):	[ ]Yes [ ]No [X]N/A	15.
Trip Blank Present:	[ ]Yes [ ]No [X]N/A	16.
Trip Blank Custody Seals Present	[ ]Yes [ ]No [X]N/A	
Pace Trip Blank Lot # (if purchased):		

Client Notification/ Resolution: Field Data Required? Y / N

Person Contacted: _____ Date/Time: _____

Comments/ Resolution: _____

Project Manager Review: _____ **Date:** 7/17/14

Note: Whenever there is a discrepancy affecting North Carolina compliance samples, a copy of this form will be sent to the North Carolina DEHNR Certification Office (i.e out of hold, incorrect preservative, out of temp, incorrect containers)

Pace Analytical Services, Inc.
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Billings, MT 591014549
(406)254-7226

August 12, 2011

Kevin Houck
Herrera Environmental Consultants
101 East Broadway, Suite 610
Missoula, MT 59802

RE: Project: Black Pine Mine
Pace Project No.: 10163643

Dear Kevin Houck:
Enclosed are the analytical results for sample(s) received by the laboratory on July 16, 2011. The results relate only to the samples included in this report.

If you have any questions concerning this report, please feel free to contact me.

Sincerely,

Sally Heinje

sally.heinje@pacelabs.com
Project Manager

Enclosures

cc: Devin Clary, Montana Dept. of Environmental Quality
Mark Donner, Trihydro

REPORT OF LABORATORY ANALYSIS

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CERTIFICATIONS

Project: Black Pine Mine
Pace Project No.: 10163643

Minnesota Certification IDs

1700 Elm Street SE Suite 200, Minneapolis, MN 55414
A2LA Certification #: 2926.01
Alaska Certification #: UST-078
Alaska Certification #MN00064
Arizona Certification #: AZ-0014
Arkansas Certification #: 88-0680
California Certification #: 01155CA
EPA Region 8 Certification #: Pace
Florida/NELAP Certification #: E87605
Georgia Certification #: 959
Idaho Certification #: MN00064
Illinois Certification #: 200011
Iowa Certification #: 368
Kansas Certification #: E-10167
Louisiana Certification #: 03086
Louisiana Certification #: LA080009
Maine Certification #: 2007029
Maryland Certification #: 322
Michigan DEQ Certification #: 9909
Minnesota Certification #: 027-053-137
Mississippi Certification #: Pace
Montana Certification #: MT CERT0092
Nebraska Certification #: Pace
Nevada Certification #: MN_00064
New Jersey Certification #: MN-002
New Mexico Certification #: Pace
New York Certification #: 11647
North Carolina Certification #: 530
North Dakota Certification #: R-036
North Dakota Certification #: R-036A
Ohio VAP Certification #: CL101
Oklahoma Certification #: D9921
Oklahoma Certification #: 9507
Oregon Certification #: MN200001
Pennsylvania Certification #: 68-00563
Puerto Rico Certification
Tennessee Certification #: 02818
Texas Certification #: T104704192
Washington Certification #: C754
Wisconsin Certification #: 999407970

Montana Certification IDs

602 South 25th Street, Billings, MT 59101
EPA Region 8 Certification #: 8TMS-Q
Idaho Certification #: MT00012
Montana Certification #: MT CERT0040
NVLAP Certification #: 101292-0
Minnesota Dept of Health Certification #: 030-999-442

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SAMPLE SUMMARY

Project: Black Pine Mine
Pace Project No.: 10163643

Lab ID	Sample ID	Matrix	Date Collected	Date Received
10163643001	**BP-CML-TS-07-00**	Solid	07/15/11 12:32	07/16/11 11:30
10163643002	**BP-CML-TS-07-02**	Solid	07/15/11 12:35	07/16/11 11:30
10163643003	**BP-CML-SS-07-05**	Solid	07/15/11 12:37	07/16/11 11:30
10163643004	**BP-CML-TS-08-00**	Solid	07/15/11 12:55	07/16/11 11:30
10163643005	**BP-CML-TS-08-05**	Solid	07/15/11 12:58	07/16/11 11:30
10163643006	**BP-CML-SS-08-07**	Solid	07/15/11 13:00	07/16/11 11:30
10163643007	**BP-CML-TS-09-00**	Solid	07/15/11 13:35	07/16/11 11:30
10163643008	**BP-CML-TS-09-02**	Solid	07/15/11 13:37	07/16/11 11:30
10163643009	**BP-CML-TS-09-04**	Solid	07/15/11 13:39	07/16/11 11:30
10163643010	**BP-CML-TS-09-06**	Solid	07/15/11 13:40	07/16/11 11:30

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SAMPLE ANALYTE COUNT

Project: Black Pine Mine
Pace Project No.: 10163643

Lab ID	Sample ID	Method	Analysts	Analytes Reported	Laboratory
10163643001	**BP-CML-TS-07-00**	EPA 6020	TL1	12	PASI-M
		EPA 7471	TEM	1	PASI-M
		% Moisture	JDL	1	PASI-M
10163643002	**BP-CML-TS-07-02**	EPA 6020	TL1	12	PASI-M
		EPA 7471	TEM	1	PASI-M
		% Moisture	JDL	1	PASI-M
		Modified Sobek 3.2	JH1	1	PASI-MT
		Modified Sobek 3.2	JH1	5	PASI-MT
		Modified Sobek 3.2	JH1	4	PASI-MT
		Modified Sobek 3.2	JH1	1	PASI-MT
10163643003	**BP-CML-SS-07-05**	EPA 6020	TL1	12	PASI-M
		EPA 7471	TEM	1	PASI-M
		% Moisture	JDL	1	PASI-M
10163643004	**BP-CML-TS-08-00**	EPA 6020	TL1	12	PASI-M
		EPA 7471	TEM	1	PASI-M
		% Moisture	JDL	1	PASI-M
10163643005	**BP-CML-TS-08-05**	EPA 6020	TL1	12	PASI-M
		EPA 7471	TEM	1	PASI-M
		% Moisture	JDL	1	PASI-M
		Modified Sobek 3.2	JH1	1	PASI-MT
		Modified Sobek 3.2	JH1	5	PASI-MT
		Modified Sobek 3.2	JH1	4	PASI-MT
		Modified Sobek 3.2	JH1	1	PASI-MT
10163643006	**BP-CML-SS-08-07**	EPA 6020	TL1	12	PASI-M
		EPA 7471	TEM	1	PASI-M
		% Moisture	JDL	1	PASI-M
10163643007	**BP-CML-TS-09-00**	EPA 6020	CJS, TL1	12	PASI-M
		EPA 7471	TEM	1	PASI-M
		% Moisture	JDL	1	PASI-M
10163643008	**BP-CML-TS-09-02**	EPA 6020	TL1	12	PASI-M
		EPA 7471	TEM	1	PASI-M
		% Moisture	JDL	1	PASI-M
10163643009	**BP-CML-TS-09-04**	EPA 6020	TL1	12	PASI-M
		EPA 7471	TEM	1	PASI-M
		% Moisture	JDL	1	PASI-M
10163643010	**BP-CML-TS-09-06**	EPA 6020	TL1	12	PASI-M
		EPA 7471	TEM	1	PASI-M

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SAMPLE ANALYTE COUNT

Project: Black Pine Mine
Pace Project No.: 10163643

Lab ID	Sample ID	Method	Analysts	Analytes Reported	Laboratory
		% Moisture	JDL	1	PASI-M

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PROJECT NARRATIVE

Project: Black Pine Mine
Pace Project No.: 10163643

Method: **EPA 6020**
Description: 6020 MET ICPMS
Client: Montana Dept. of Environmental Quality
Date: August 12, 2011

General Information:
10 samples were analyzed for EPA 6020. All samples were received in acceptable condition with any exceptions noted below.

Hold Time:
The samples were analyzed within the method required hold times with any exceptions noted below.

Sample Preparation:
The samples were prepared in accordance with EPA 3050 with any exceptions noted below.

Initial Calibrations (including MS Tune as applicable):
All criteria were within method requirements with any exceptions noted below.

Continuing Calibration:
All criteria were within method requirements with any exceptions noted below.

Internal Standards:
All internal standards were within QC limits with any exceptions noted below.

Method Blank:
All analytes were below the report limit in the method blank with any exceptions noted below.

Laboratory Control Spike:
All laboratory control spike compounds were within QC limits with any exceptions noted below.

Matrix Spikes:
All percent recoveries and relative percent differences (RPDs) were within acceptance criteria with any exceptions noted below.

QC Batch: MPRP/27164

A matrix spike and matrix spike duplicate (MS/MSD) were performed on the following sample(s): 10163643001,10163644001

M6: Matrix spike and Matrix spike duplicate recovery not evaluated against control limits due to sample dilution.

- MS (Lab ID: 1014840)
  - Antimony
  - Arsenic
  - Barium
  - Copper
  - Iron
  - Lead
  - Manganese
  - Zinc
- MS (Lab ID: 1014842)
  - Antimony
  - Arsenic
  - Barium
  - Copper

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PROJECT NARRATIVE

Project: Black Pine Mine
Pace Project No.: 10163643

Method: **EPA 6020**
Description: 6020 MET ICPMS
Client: Montana Dept. of Environmental Quality
Date: August 12, 2011

QC Batch: MPRP/27164

A matrix spike and matrix spike duplicate (MS/MSD) were performed on the following sample(s): 10163643001,10163644001

M6: Matrix spike and Matrix spike duplicate recovery not evaluated against control limits due to sample dilution.

- Iron
- Lead
- Manganese
- Zinc

- MSD (Lab ID: 1014841)
  - Antimony
  - Arsenic
  - Barium
  - Copper
  - Iron
  - Lead
  - Manganese
  - Nickel
  - Zinc

Duplicate Sample:
All duplicate sample results were within method acceptance criteria with any exceptions noted below.

Additional Comments:

Analyte Comments:

QC Batch: MPRP/27164

E: Analyte concentration exceeded the calibration range. The reported result is estimated.

- MS (Lab ID: 1014840)
  - Copper
  - Lead
- MSD (Lab ID: 1014841)
  - Lead

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PROJECT NARRATIVE

Project: Black Pine Mine
Pace Project No.: 10163643

Method: **EPA 7471**
Description: 7471 Mercury
Client: Montana Dept. of Environmental Quality
Date: August 12, 2011

General Information:
10 samples were analyzed for EPA 7471. All samples were received in acceptable condition with any exceptions noted below.

Hold Time:
The samples were analyzed within the method required hold times with any exceptions noted below.

Sample Preparation:
The samples were prepared in accordance with EPA 7471 with any exceptions noted below.

Initial Calibrations (including MS Tune as applicable):
All criteria were within method requirements with any exceptions noted below.

Continuing Calibration:
All criteria were within method requirements with any exceptions noted below.

Method Blank:
All analytes were below the report limit in the method blank with any exceptions noted below.

Laboratory Control Spike:
All laboratory control spike compounds were within QC limits with any exceptions noted below.

Matrix Spikes:
All percent recoveries and relative percent differences (RPDs) were within acceptance criteria with any exceptions noted below.

QC Batch: MERP/5651

A matrix spike and matrix spike duplicate (MS/MSD) were performed on the following sample(s): 10163643010,10163645009

M1: Matrix spike recovery exceeded QC limits. Batch accepted based on laboratory control sample (LCS) recovery.

- MS (Lab ID: 1016616)
  - Mercury

M6: Matrix spike and Matrix spike duplicate recovery not evaluated against control limits due to sample dilution.

- MS (Lab ID: 1016614)
  - Mercury
- MSD (Lab ID: 1016615)
  - Mercury

QC Batch: MERP/5650

A matrix spike and matrix spike duplicate (MS/MSD) were performed on the following sample(s): 10163634009,10163643009

M1: Matrix spike recovery exceeded QC limits. Batch accepted based on laboratory control sample (LCS) recovery.

- MS (Lab ID: 1016609)
  - Mercury
- MSD (Lab ID: 1016610)
  - Mercury

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PROJECT NARRATIVE

Project: Black Pine Mine
Pace Project No.: 10163643

Method: **EPA 7471**
Description: 7471 Mercury
Client: Montana Dept. of Environmental Quality
Date: August 12, 2011

QC Batch: MERP/5650

A matrix spike and matrix spike duplicate (MS/MSD) were performed on the following sample(s): 10163634009,10163643009

M6: Matrix spike and Matrix spike duplicate recovery not evaluated against control limits due to sample dilution.

- MS (Lab ID: 1016611)
  - Mercury

Duplicate Sample:
All duplicate sample results were within method acceptance criteria with any exceptions noted below.

Additional Comments:

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PROJECT NARRATIVE

Project: Black Pine Mine
Pace Project No.: 10163643

Method: **Modified Sobek 3.2**
Description: Sobek Acid Base Potential
Client: Montana Dept. of Environmental Quality
Date: August 12, 2011

General Information:
2 samples were analyzed for Modified Sobek 3.2. All samples were received in acceptable condition with any exceptions noted below.

Hold Time:
The samples were analyzed within the method required hold times with any exceptions noted below.

Initial Calibrations (including MS Tune as applicable):
All criteria were within method requirements with any exceptions noted below.

Continuing Calibration:
All criteria were within method requirements with any exceptions noted below.

Internal Standards:
All internal standards were within QC limits with any exceptions noted below.

Surrogates:
All surrogates were within QC limits with any exceptions noted below.

Method Blank:
All analytes were below the report limit in the method blank with any exceptions noted below.

Laboratory Control Spike:
All laboratory control spike compounds were within QC limits with any exceptions noted below.

Matrix Spikes:
All percent recoveries and relative percent differences (RPDs) were within acceptance criteria with any exceptions noted below.

Duplicate Sample:
All duplicate sample results were within method acceptance criteria with any exceptions noted below.

Additional Comments:

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PROJECT NARRATIVE

Project: Black Pine Mine
Pace Project No.: 10163643

Method: **Modified Sobek 3.2**
Description: Sobek Extractable Sulfur
Client: Montana Dept. of Environmental Quality
Date: August 12, 2011

General Information:
2 samples were analyzed for Modified Sobek 3.2. All samples were received in acceptable condition with any exceptions noted below.

Hold Time:
The samples were analyzed within the method required hold times with any exceptions noted below.

Initial Calibrations (including MS Tune as applicable):
All criteria were within method requirements with any exceptions noted below.

Continuing Calibration:
All criteria were within method requirements with any exceptions noted below.

Internal Standards:
All internal standards were within QC limits with any exceptions noted below.

Surrogates:
All surrogates were within QC limits with any exceptions noted below.

Method Blank:
All analytes were below the report limit in the method blank with any exceptions noted below.

Laboratory Control Spike:
All laboratory control spike compounds were within QC limits with any exceptions noted below.

Matrix Spikes:
All percent recoveries and relative percent differences (RPDs) were within acceptance criteria with any exceptions noted below.

Duplicate Sample:
All duplicate sample results were within method acceptance criteria with any exceptions noted below.

Additional Comments:

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PROJECT NARRATIVE

Project: Black Pine Mine
Pace Project No.: 10163643

Method: **Modified Sobek 3.2**
Description: Sobek Calculations
Client: Montana Dept. of Environmental Quality
Date: August 12, 2011

General Information:
2 samples were analyzed for Modified Sobek 3.2. All samples were received in acceptable condition with any exceptions noted below.

Hold Time:
The samples were analyzed within the method required hold times with any exceptions noted below.

Initial Calibrations (including MS Tune as applicable):
All criteria were within method requirements with any exceptions noted below.

Continuing Calibration:
All criteria were within method requirements with any exceptions noted below.

Internal Standards:
All internal standards were within QC limits with any exceptions noted below.

Surrogates:
All surrogates were within QC limits with any exceptions noted below.

Method Blank:
All analytes were below the report limit in the method blank with any exceptions noted below.

Laboratory Control Spike:
All laboratory control spike compounds were within QC limits with any exceptions noted below.

Matrix Spikes:
All percent recoveries and relative percent differences (RPDs) were within acceptance criteria with any exceptions noted below.

Duplicate Sample:
All duplicate sample results were within method acceptance criteria with any exceptions noted below.

Additional Comments:

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PROJECT NARRATIVE

Project: Black Pine Mine
Pace Project No.: 10163643

Method: **Modified Sobek 3.2**
Description: Sobek SMP Buffer pH
Client: Montana Dept. of Environmental Quality
Date: August 12, 2011

General Information:
2 samples were analyzed for Modified Sobek 3.2. All samples were received in acceptable condition with any exceptions noted below.

Hold Time:
The samples were analyzed within the method required hold times with any exceptions noted below.

Initial Calibrations (including MS Tune as applicable):
All criteria were within method requirements with any exceptions noted below.

Continuing Calibration:
All criteria were within method requirements with any exceptions noted below.

Internal Standards:
All internal standards were within QC limits with any exceptions noted below.

Surrogates:
All surrogates were within QC limits with any exceptions noted below.

Method Blank:
All analytes were below the report limit in the method blank with any exceptions noted below.

Laboratory Control Spike:
All laboratory control spike compounds were within QC limits with any exceptions noted below.

Matrix Spikes:
All percent recoveries and relative percent differences (RPDs) were within acceptance criteria with any exceptions noted below.

Duplicate Sample:
All duplicate sample results were within method acceptance criteria with any exceptions noted below.

Additional Comments:

This data package has been reviewed for quality and completeness and is approved for release.

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ANALYTICAL RESULTS

Project: Black Pine Mine
Pace Project No.: 10163643

Sample: BP-CML-TS-07-00 **Lab ID: 10163643001** Collected: 07/15/11 12:32 Received: 07/16/11 11:30 Matrix: Solid

Results reported on a "dry-weight" basis

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
6020 MET ICPMS	Analytical Method: EPA 6020 Preparation Method: EPA 3050							
Antimony	**529**	mg/kg	2.5	100	07/25/11 09:00	07/29/11 19:03	7440-36-0	M6
Arsenic	**496**	mg/kg	2.5	100	07/25/11 09:00	07/29/11 19:03	7440-38-2	M6
Barium	**289**	mg/kg	0.30	20	07/25/11 09:00	07/29/11 18:59	7440-39-3	M6
Cadmium	**7.5**	mg/kg	0.080	20	07/25/11 09:00	07/29/11 18:59	7440-43-9	
Chromium	**3.7**	mg/kg	0.50	20	07/25/11 09:00	07/29/11 18:59	7440-47-3	
Copper	**1110**	mg/kg	2.5	100	07/25/11 09:00	07/29/11 19:03	7440-50-8	M6
Iron	**27600**	mg/kg	249	100	07/25/11 09:00	07/29/11 19:03	7439-89-6	M6
Lead	**2650**	mg/kg	1.0	200	07/25/11 09:00	07/30/11 19:59	7439-92-1	M6
Manganese	**315**	mg/kg	0.50	20	07/25/11 09:00	07/29/11 18:59	7439-96-5	M6
Nickel	**9.3**	mg/kg	2.5	100	07/25/11 09:00	07/29/11 19:03	7440-02-0	M6
Silver	**52.5**	mg/kg	0.50	20	07/25/11 09:00	07/29/11 18:59	7440-22-4	
Zinc	**250**	mg/kg	24.9	100	07/25/11 09:00	07/29/11 19:03	7440-66-6	M6
7471 Mercury	Analytical Method: EPA 7471 Preparation Method: EPA 7471							
Mercury	**215**	mg/kg	6.1	250	07/28/11 16:35	07/31/11 10:43	7439-97-6	
Dry Weight	Analytical Method: % Moisture							
Percent Moisture	**20.4**	%	0.10	1		07/25/11 00:00		

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ANALYTICAL RESULTS

Project: Black Pine Mine
Pace Project No.: 10163643

Sample: BP-CML-TS-07-02 **Lab ID: 10163643002** Collected: 07/15/11 12:35 Received: 07/16/11 11:30 Matrix: Solid

Results reported on a "dry-weight" basis

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
6020 MET ICPMS	Analytical Method: EPA 6020 Preparation Method: EPA 3050							
Antimony	**690**	mg/kg	2.6	100	07/25/11 09:00	07/29/11 19:10	7440-36-0	
Arsenic	**633**	mg/kg	2.6	100	07/25/11 09:00	07/29/11 19:10	7440-38-2	
Barium	**207**	mg/kg	0.31	20	07/25/11 09:00	07/29/11 19:06	7440-39-3	
Cadmium	**12.5**	mg/kg	0.084	20	07/25/11 09:00	07/29/11 19:06	7440-43-9	
Chromium	**<0.52**	mg/kg	0.52	20	07/25/11 09:00	07/29/11 19:06	7440-47-3	
Copper	**941**	mg/kg	2.6	100	07/25/11 09:00	07/29/11 19:10	7440-50-8	
Iron	**15500**	mg/kg	52.4	20	07/25/11 09:00	07/29/11 19:06	7439-89-6	
Lead	**3290**	mg/kg	1.0	200	07/25/11 09:00	07/30/11 20:03	7439-92-1	
Manganese	**289**	mg/kg	0.52	20	07/25/11 09:00	07/29/11 19:06	7439-96-5	
Nickel	**1.6**	mg/kg	0.52	20	07/25/11 09:00	07/29/11 19:06	7440-02-0	
Silver	**96.2**	mg/kg	0.52	20	07/25/11 09:00	07/29/11 19:06	7440-22-4	
Zinc	**334**	mg/kg	5.2	20	07/25/11 09:00	07/29/11 19:06	7440-66-6	
7471 Mercury	Analytical Method: EPA 7471 Preparation Method: EPA 7471							
Mercury	**221**	mg/kg	5.4	250	07/28/11 16:35	07/31/11 10:55	7439-97-6	
Dry Weight	Analytical Method: % Moisture							
Percent Moisture	**8.2**	%	0.10	1		07/25/11 00:00		
Sobek Acid Base Potential	Analytical Method: Modified Sobek 3.2							
Neutralization Potential	**0.73**	tons/1000	0.50	1		08/01/11 00:00		
Sobek Extractable Sulfur	Analytical Method: Modified Sobek 3.2							
Sulfur, HCl Extractable	**<0.050**	% (w/w)	0.050	1		08/09/11 09:58		
Sulfur, HNO3 Extractable	**<0.050**	% (w/w)	0.050	1		08/09/11 09:58		
Sulfur, Hot Water Extractable	**<0.050**	% (w/w)	0.050	1		08/09/11 09:58		
Sulfur, Residual	**<0.050**	% (w/w)	0.050	1		08/09/11 09:58		
Total Sulfur	**0.0530**	% (w/w)	0.050	1		08/09/11 09:58		
Sobek Calculations	Analytical Method: Modified Sobek 3.2							
Acid/Base Potential	**0.73**	tons/1000		1		08/01/11 00:00		
Acid Potential	**<4.3**	tons/1000	4.3	1		08/01/11 00:00		
Lime Requirement	**<5.4**	tons/1000	5.4	1		08/01/11 00:00		
SMP Lime Requirement	**0**	tons/1000	0.0	1		08/01/11 00:00		
Sobek SMP Buffer pH	Analytical Method: Modified Sobek 3.2							
SMP Buffer pH	**7.3**	Std. Units	0.10	1		07/29/11 13:24		

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ANALYTICAL RESULTS

Project: Black Pine Mine
Pace Project No.: 10163643

Sample: BP-CML-SS-07-05 **Lab ID: 10163643003** Collected: 07/15/11 12:37 Received: 07/16/11 11:30 Matrix: Solid

Results reported on a "dry-weight" basis

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
6020 MET ICPMS	Analytical Method: EPA 6020 Preparation Method: EPA 3050							
Antimony	**30.3**	mg/kg	0.43	20	07/25/11 09:00	07/29/11 19:13	7440-36-0	
Arsenic	**39.5**	mg/kg	0.43	20	07/25/11 09:00	07/29/11 19:13	7440-38-2	
Barium	**151**	mg/kg	0.26	20	07/25/11 09:00	07/29/11 19:13	7440-39-3	
Cadmium	**1.5**	mg/kg	0.069	20	07/25/11 09:00	07/29/11 19:13	7440-43-9	
Chromium	**5.2**	mg/kg	0.43	20	07/25/11 09:00	07/29/11 19:13	7440-47-3	
Copper	**231**	mg/kg	0.43	20	07/25/11 09:00	07/29/11 19:13	7440-50-8	
Iron	**22400**	mg/kg	216	100	07/25/11 09:00	07/29/11 19:17	7439-89-6	
Lead	**167**	mg/kg	0.086	20	07/25/11 09:00	07/29/11 19:13	7439-92-1	
Manganese	**1600**	mg/kg	2.2	100	07/25/11 09:00	07/29/11 19:17	7439-96-5	
Nickel	**8.0**	mg/kg	0.43	20	07/25/11 09:00	07/29/11 19:13	7440-02-0	
Silver	**2.4**	mg/kg	0.43	20	07/25/11 09:00	07/29/11 19:13	7440-22-4	
Zinc	**80.7**	mg/kg	4.3	20	07/25/11 09:00	07/29/11 19:13	7440-66-6	
7471 Mercury	Analytical Method: EPA 7471 Preparation Method: EPA 7471							
Mercury	**67.5**	mg/kg	5.2	250	07/28/11 16:35	07/31/11 11:02	7439-97-6	
Dry Weight	Analytical Method: % Moisture							
Percent Moisture	**13.1**	%	0.10	1		07/25/11 00:00		

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ANALYTICAL RESULTS

Project: Black Pine Mine
Pace Project No.: 10163643

Sample: BP-CML-TS-08-00 **Lab ID: 10163643004** Collected: 07/15/11 12:55 Received: 07/16/11 11:30 Matrix: Solid

Results reported on a "dry-weight" basis

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
6020 MET ICPMS	Analytical Method: EPA 6020 Preparation Method: EPA 3050							
Antimony	**233**	mg/kg	0.47	20	07/25/11 09:00	07/29/11 19:41	7440-36-0	
Arsenic	**188**	mg/kg	0.47	20	07/25/11 09:00	07/29/11 19:41	7440-38-2	
Barium	**146**	mg/kg	0.28	20	07/25/11 09:00	07/29/11 19:41	7440-39-3	
Cadmium	**4.3**	mg/kg	0.075	20	07/25/11 09:00	07/29/11 19:41	7440-43-9	
Chromium	**2.8**	mg/kg	0.47	20	07/25/11 09:00	07/29/11 19:41	7440-47-3	
Copper	**687**	mg/kg	1.2	50	07/25/11 09:00	07/30/11 20:06	7440-50-8	
Iron	**16000**	mg/kg	46.9	20	07/25/11 09:00	07/29/11 19:41	7439-89-6	
Lead	**1290**	mg/kg	0.47	100	07/25/11 09:00	07/29/11 19:45	7439-92-1	
Manganese	**183**	mg/kg	0.47	20	07/25/11 09:00	07/29/11 19:41	7439-96-5	
Nickel	**3.4**	mg/kg	0.47	20	07/25/11 09:00	07/29/11 19:41	7440-02-0	
Silver	**20.8**	mg/kg	0.47	20	07/25/11 09:00	07/29/11 19:41	7440-22-4	
Zinc	**118**	mg/kg	4.7	20	07/25/11 09:00	07/29/11 19:41	7440-66-6	
7471 Mercury	Analytical Method: EPA 7471 Preparation Method: EPA 7471							
Mercury	**10.8**	mg/kg	0.56	25	07/28/11 16:35	07/31/11 11:04	7439-97-6	
Dry Weight	Analytical Method: % Moisture							
Percent Moisture	**25.4**	%	0.10	1		07/25/11 00:00		

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ANALYTICAL RESULTS

Project: Black Pine Mine
Pace Project No.: 10163643

Sample: BP-CML-TS-08-05 **Lab ID: 10163643005** Collected: 07/15/11 12:58 Received: 07/16/11 11:30 Matrix: Solid

Results reported on a "dry-weight" basis

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
6020 MET ICPMS	Analytical Method: EPA 6020 Preparation Method: EPA 3050							
Antimony	**360**	mg/kg	0.52	20	07/25/11 09:00	07/29/11 19:48	7440-36-0	
Arsenic	**340**	mg/kg	0.52	20	07/25/11 09:00	07/29/11 19:48	7440-38-2	
Barium	**337**	mg/kg	0.31	20	07/25/11 09:00	07/29/11 19:48	7440-39-3	
Cadmium	**8.2**	mg/kg	0.083	20	07/25/11 09:00	07/29/11 19:48	7440-43-9	
Chromium	**<0.52**	mg/kg	0.52	20	07/25/11 09:00	07/29/11 19:48	7440-47-3	
Copper	**1610**	mg/kg	5.2	200	07/25/11 09:00	07/30/11 20:13	7440-50-8	
Iron	**26600**	mg/kg	520	200	07/25/11 09:00	07/30/11 20:13	7439-89-6	
Lead	**2990**	mg/kg	1.0	200	07/25/11 09:00	07/30/11 20:13	7439-92-1	
Manganese	**1120**	mg/kg	5.2	200	07/25/11 09:00	07/30/11 20:13	7439-96-5	
Nickel	**3.7**	mg/kg	0.52	20	07/25/11 09:00	07/29/11 19:48	7440-02-0	
Silver	**113**	mg/kg	0.52	20	07/25/11 09:00	07/29/11 19:48	7440-22-4	
Zinc	**194**	mg/kg	5.2	20	07/25/11 09:00	07/29/11 19:48	7440-66-6	
7471 Mercury	Analytical Method: EPA 7471 Preparation Method: EPA 7471							
Mercury	**7.4**	mg/kg	0.76	25	07/28/11 16:35	07/31/11 11:06	7439-97-6	
Dry Weight	Analytical Method: % Moisture							
Percent Moisture	**34.5**	%	0.10	1		07/25/11 00:00		
Sobek Acid Base Potential	Analytical Method: Modified Sobek 3.2							
Neutralization Potential	**8.3**	tons/1000	0.50	1		08/01/11 00:00		
Sobek Extractable Sulfur	Analytical Method: Modified Sobek 3.2							
Sulfur, HCl Extractable	**<0.050**	% (w/w)	0.050	1		08/09/11 10:34		
Sulfur, HNO3 Extractable	**<0.050**	% (w/w)	0.050	1		08/09/11 10:34		
Sulfur, Hot Water Extractable	**<0.050**	% (w/w)	0.050	1		08/09/11 10:34		
Sulfur, Residual	**<0.050**	% (w/w)	0.050	1		08/09/11 10:34		
Total Sulfur	**0.0605**	% (w/w)	0.050	1		08/09/11 10:34		
Sobek Calculations	Analytical Method: Modified Sobek 3.2							
Acid/Base Potential	**8.3**	tons/1000		1		08/01/11 00:00		
Acid Potential	**<4.3**	tons/1000	4.3	1		08/01/11 00:00		
Lime Requirement	**<5.4**	tons/1000	5.4	1		08/01/11 00:00		
SMP Lime Requirement	**0**	tons/1000	0.0	1		08/01/11 00:00		
Sobek SMP Buffer pH	Analytical Method: Modified Sobek 3.2							
SMP Buffer pH	**7.1**	Std. Units	0.10	1		07/29/11 13:24		

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ANALYTICAL RESULTS

Project: Black Pine Mine
Pace Project No.: 10163643

Sample: BP-CML-SS-08-07 **Lab ID: 10163643006** Collected: 07/15/11 13:00 Received: 07/16/11 11:30 Matrix: Solid

Results reported on a "dry-weight" basis

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
6020 MET ICPMS	Analytical Method: EPA 6020 Preparation Method: EPA 3050							
Antimony	**1.9**	mg/kg	0.56	20	07/25/11 09:00	07/29/11 19:55	7440-36-0	
Arsenic	**8.3**	mg/kg	0.56	20	07/25/11 09:00	07/29/11 19:55	7440-38-2	
Barium	**156**	mg/kg	0.33	20	07/25/11 09:00	07/29/11 19:55	7440-39-3	
Cadmium	**0.12**	mg/kg	0.089	20	07/25/11 09:00	07/29/11 19:55	7440-43-9	
Chromium	**5.4**	mg/kg	0.56	20	07/25/11 09:00	07/29/11 19:55	7440-47-3	
Copper	**35.1**	mg/kg	0.56	20	07/25/11 09:00	07/29/11 19:55	7440-50-8	
Iron	**18800**	mg/kg	55.5	20	07/25/11 09:00	07/29/11 19:55	7439-89-6	
Lead	**20.1**	mg/kg	0.11	20	07/25/11 09:00	07/29/11 19:55	7439-92-1	
Manganese	**457**	mg/kg	0.56	20	07/25/11 09:00	07/29/11 19:55	7439-96-5	
Nickel	**7.0**	mg/kg	0.56	20	07/25/11 09:00	07/29/11 19:55	7440-02-0	
Silver	**7.1**	mg/kg	5.6	200	07/25/11 09:00	07/30/11 20:17	7440-22-4	
Zinc	**178**	mg/kg	5.6	20	07/25/11 09:00	07/29/11 19:55	7440-66-6	
7471 Mercury	Analytical Method: EPA 7471 Preparation Method: EPA 7471							
Mercury	**130**	mg/kg	6.5	250	07/28/11 16:35	07/31/11 11:14	7439-97-6	
Dry Weight	Analytical Method: % Moisture							
Percent Moisture	**23.7**	%	0.10	1		07/25/11 00:00		

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ANALYTICAL RESULTS

Project: Black Pine Mine
Pace Project No.: 10163643

Sample: BP-CML-TS-09-00 **Lab ID: 10163643007** Collected: 07/15/11 13:35 Received: 07/16/11 11:30 Matrix: Solid

Results reported on a "dry-weight" basis

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
6020 MET ICPMS	Analytical Method: EPA 6020 Preparation Method: EPA 3050							
Antimony	**3210**	mg/kg	6.4	200	07/25/11 09:00	07/30/11 20:20	7440-36-0	
Arsenic	**2440**	mg/kg	3.2	100	07/25/11 09:00	07/29/11 20:06	7440-38-2	
Barium	**424**	mg/kg	0.39	20	07/25/11 09:00	07/29/11 20:02	7440-39-3	
Cadmium	**49.2**	mg/kg	0.10	20	07/25/11 09:00	07/29/11 20:02	7440-43-9	
Chromium	**<0.64**	mg/kg	0.64	20	07/25/11 09:00	07/29/11 20:02	7440-47-3	
Copper	**6630**	mg/kg	12.8	400	07/25/11 09:00	07/31/11 14:39	7440-50-8	
Iron	**52500**	mg/kg	321	100	07/25/11 09:00	07/29/11 20:06	7439-89-6	
Lead	**9520**	mg/kg	2.6	400	07/25/11 09:00	07/31/11 14:39	7439-92-1	
Manganese	**439**	mg/kg	0.64	20	07/25/11 09:00	07/29/11 20:02	7439-96-5	
Nickel	**6.2**	mg/kg	0.64	20	07/25/11 09:00	07/29/11 20:02	7440-02-0	
Silver	**168**	mg/kg	0.64	20	07/25/11 09:00	07/29/11 20:02	7440-22-4	
Zinc	**1110**	mg/kg	32.1	100	07/25/11 09:00	07/29/11 20:06	7440-66-6	
7471 Mercury	Analytical Method: EPA 7471 Preparation Method: EPA 7471							
Mercury	**<0.024**	mg/kg	0.024	1	07/28/11 16:35	07/31/11 11:30	7439-97-6	
Dry Weight	Analytical Method: % Moisture							
Percent Moisture	**34.5**	%	0.10	1		07/25/11 00:00		

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ANALYTICAL RESULTS

Project: Black Pine Mine
Pace Project No.: 10163643

Sample: BP-CML-TS-09-02 **Lab ID: 10163643008** Collected: 07/15/11 13:37 Received: 07/16/11 11:30 Matrix: Solid

Results reported on a "dry-weight" basis

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
6020 MET ICPMS	Analytical Method: EPA 6020 Preparation Method: EPA 3050							
Antimony	**1280**	mg/kg	2.5	100	07/25/11 09:00	07/29/11 20:13	7440-36-0	
Arsenic	**5140**	mg/kg	9.8	400	07/25/11 09:00	07/30/11 20:24	7440-38-2	
Barium	**464**	mg/kg	1.5	100	07/25/11 09:00	07/29/11 20:13	7440-39-3	
Cadmium	**13.2**	mg/kg	0.079	20	07/25/11 09:00	07/29/11 20:09	7440-43-9	
Chromium	**<0.49**	mg/kg	0.49	20	07/25/11 09:00	07/29/11 20:09	7440-47-3	
Copper	**3120**	mg/kg	9.8	400	07/25/11 09:00	07/30/11 20:24	7440-50-8	
Iron	**60700**	mg/kg	246	100	07/25/11 09:00	07/29/11 20:13	7439-89-6	
Lead	**23600**	mg/kg	4.9	1000	07/25/11 09:00	07/30/11 20:27	7439-92-1	
Manganese	**84.4**	mg/kg	0.49	20	07/25/11 09:00	07/29/11 20:09	7439-96-5	
Nickel	**3.6**	mg/kg	0.49	20	07/25/11 09:00	07/29/11 20:09	7440-02-0	
Silver	**119**	mg/kg	0.49	20	07/25/11 09:00	07/29/11 20:09	7440-22-4	
Zinc	**122**	mg/kg	4.9	20	07/25/11 09:00	07/29/11 20:09	7440-66-6	
7471 Mercury	Analytical Method: EPA 7471 Preparation Method: EPA 7471							
Mercury	**0.64**	mg/kg	0.54	25	07/28/11 16:35	07/31/11 11:32	7439-97-6	
Dry Weight	Analytical Method: % Moisture							
Percent Moisture	**18.6**	%	0.10	1		07/25/11 00:00		

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ANALYTICAL RESULTS

Project: Black Pine Mine
Pace Project No.: 10163643

Sample: BP-CML-TS-09-04 **Lab ID: 10163643009** Collected: 07/15/11 13:39 Received: 07/16/11 11:30 Matrix: Solid

Results reported on a "dry-weight" basis

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
6020 MET ICPMS	Analytical Method: EPA 6020 Preparation Method: EPA 3050							
Antimony	**2540**	mg/kg	10.7	400	07/25/11 09:00	07/30/11 20:31	7440-36-0	
Arsenic	**4980**	mg/kg	10.7	400	07/25/11 09:00	07/30/11 20:31	7440-38-2	
Barium	**315**	mg/kg	0.32	20	07/25/11 09:00	07/29/11 20:27	7440-39-3	
Cadmium	**35.2**	mg/kg	0.086	20	07/25/11 09:00	07/29/11 20:27	7440-43-9	
Chromium	**<0.54**	mg/kg	0.54	20	07/25/11 09:00	07/29/11 20:27	7440-47-3	
Copper	**5580**	mg/kg	10.7	400	07/25/11 09:00	07/30/11 20:31	7440-50-8	
Iron	**67700**	mg/kg	269	100	07/25/11 09:00	07/29/11 20:30	7439-89-6	
Lead	**15100**	mg/kg	5.4	1000	07/25/11 09:00	07/30/11 20:55	7439-92-1	
Manganese	**234**	mg/kg	0.54	20	07/25/11 09:00	07/29/11 20:27	7439-96-5	
Nickel	**2.2**	mg/kg	0.54	20	07/25/11 09:00	07/29/11 20:27	7440-02-0	
Silver	**108**	mg/kg	0.54	20	07/25/11 09:00	07/29/11 20:27	7440-22-4	
Zinc	**273**	mg/kg	5.4	20	07/25/11 09:00	07/29/11 20:27	7440-66-6	
7471 Mercury	Analytical Method: EPA 7471 Preparation Method: EPA 7471							
Mercury	**137**	mg/kg	5.1	250	07/28/11 16:35	07/31/11 11:40	7439-97-6	M6
Dry Weight	Analytical Method: % Moisture							
Percent Moisture	**16.2**	%	0.10	1		07/25/11 00:00		

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ANALYTICAL RESULTS

Project: Black Pine Mine
Pace Project No.: 10163643

Sample: BP-CML-TS-09-06 **Lab ID: 10163643010** Collected: 07/15/11 13:40 Received: 07/16/11 11:30 Matrix: Solid

Results reported on a "dry-weight" basis

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
6020 MET ICPMS	Analytical Method: EPA 6020 Preparation Method: EPA 3050							
Antimony	**15700**	mg/kg	27.8	1000	07/25/11 09:00	07/30/11 21:02	7440-36-0	
Arsenic	**4200**	mg/kg	11.1	400	07/25/11 09:00	07/30/11 20:59	7440-38-2	
Barium	**390**	mg/kg	0.33	20	07/25/11 09:00	07/29/11 20:34	7440-39-3	
Cadmium	**99.9**	mg/kg	0.089	20	07/25/11 09:00	07/29/11 20:34	7440-43-9	
Chromium	**<0.56**	mg/kg	0.56	20	07/25/11 09:00	07/29/11 20:34	7440-47-3	
Copper	**22700**	mg/kg	27.8	1000	07/25/11 09:00	07/30/11 21:02	7440-50-8	
Iron	**50700**	mg/kg	278	100	07/25/11 09:00	07/29/11 20:37	7439-89-6	
Lead	**12600**	mg/kg	5.6	1000	07/25/11 09:00	07/30/11 21:02	7439-92-1	
Manganese	**815**	mg/kg	2.8	100	07/25/11 09:00	07/29/11 20:37	7439-96-5	
Nickel	**20.7**	mg/kg	0.56	20	07/25/11 09:00	07/29/11 20:34	7440-02-0	
Silver	**159**	mg/kg	0.56	20	07/25/11 09:00	07/29/11 20:34	7440-22-4	
Zinc	**1570**	mg/kg	27.8	100	07/25/11 09:00	07/29/11 20:37	7440-66-6	
7471 Mercury	Analytical Method: EPA 7471 Preparation Method: EPA 7471							
Mercury	**4.1**	mg/kg	0.26	10	07/22/11 14:31	08/01/11 13:40	7439-97-6	M6
Dry Weight	Analytical Method: % Moisture							
Percent Moisture	**22.6**	%	0.10	1		07/25/11 00:00		

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QUALITY CONTROL DATA

Project: Black Pine Mine
Pace Project No.: 10163643

QC Batch: MPRP/27164 Analysis Method: EPA 6020
QC Batch Method: EPA 3050 Analysis Description: 6020 MET
Associated Lab Samples: 10163643001, 10163643002, 10163643003, 10163643004, 10163643005, 10163643006, 10163643007, 10163643008

METHOD BLANK: 1014838 Matrix: Solid
Associated Lab Samples: 10163643001, 10163643002, 10163643003, 10163643004, 10163643005, 10163643006, 10163643007, 10163643008, 10163643009, 10163643010

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Antimony	mg/kg	<0.49	0.49	07/29/11 18:56	
Arsenic	mg/kg	<0.49	0.49	07/29/11 18:56	
Barium	mg/kg	<0.29	0.29	07/29/11 18:56	
Cadmium	mg/kg	<0.078	0.078	07/29/11 18:56	
Chromium	mg/kg	<0.49	0.49	07/29/11 18:56	
Copper	mg/kg	<0.49	0.49	07/29/11 18:56	
Iron	mg/kg	<49.0	49.0	07/29/11 18:56	
Lead	mg/kg	<0.098	0.098	07/29/11 18:56	
Manganese	mg/kg	<0.49	0.49	07/29/11 18:56	
Nickel	mg/kg	<0.49	0.49	07/29/11 18:56	
Silver	mg/kg	<0.49	0.49	07/29/11 18:56	
Zinc	mg/kg	<4.9	4.9	07/29/11 18:56	

LABORATORY CONTROL SAMPLE: 1014839

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Antimony	mg/kg	19.4	21.2	109	75-125	
Arsenic	mg/kg	19.4	21.1	109	75-125	
Barium	mg/kg	19.4	20.1	104	75-125	
Cadmium	mg/kg	19.4	19.8	102	75-125	
Chromium	mg/kg	19.4	20.5	105	75-125	
Copper	mg/kg	19.4	20.6	106	75-125	
Iron	mg/kg	243	258	106	75-125	
Lead	mg/kg	19.4	20.2	104	75-125	
Manganese	mg/kg	19.4	20.1	104	75-125	
Nickel	mg/kg	19.4	21.5	111	75-125	
Silver	mg/kg	19.4	22.0	114	75-125	
Zinc	mg/kg	19.4	20.7	106	75-125	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 1014840 1014841

Parameter	Units	10163643001 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Antimony	mg/kg	529	23.7	19.3	523	420	-26	-566	75-125	22	20	D6,M6
Arsenic	mg/kg	496	23.7	19.3	469	395	-115	-522	75-125	17	20	M6
Barium	mg/kg	289	23.7	19.3	332	266	181	-122	75-125	22	20	D6,M6
Cadmium	mg/kg	7.5	23.7	19.3	31.5	22.4	101	77	75-125	33	20	D6
Chromium	mg/kg	3.7	23.7	19.3	27.8	19.4	101	81	75-125	35	20	D6

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QUALITY CONTROL DATA

Project: Black Pine Mine
Pace Project No.: 10163643

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 1014840 1014841

Parameter	Units	10163643001 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Copper	mg/kg	1110	23.7	19.3	1140	860	146	-1290	75-125	28	20	D6,E, M6
Iron	mg/kg	27600	296	241	25900	21300	-570	-2590	75-125	19	20	M6
Lead	mg/kg	2650	23.7	19.3	2410	2110	-978	-2760	75-125	13	20	E,M6
Manganese	mg/kg	315	23.7	19.3	281	249	-143	-341	75-125	12	20	M6
Nickel	mg/kg	9.3	23.7	19.3	32.8	21.8	99	65	75-125	40	20	D6,M6
Silver	mg/kg	52.5	23.7	19.3	82.1	71.2	125	97	75-125	14	20	
Zinc	mg/kg	250	23.7	19.3	314	224	268	-136	75-125	33	20	D6,M6

MATRIX SPIKE SAMPLE: 1014842

Parameter	Units	10163644001 Result	Spike Conc.	MS Result	MS % Rec	% Rec Limits	Qualifiers
Antimony	mg/kg	15.0	19.3	18.9	20	75-125	M6
Arsenic	mg/kg	8.6	19.3	34.2	133	75-125	M6
Barium	mg/kg	237	19.3	177	-308	75-125	M6
Cadmium	mg/kg	1.4	19.3	19.4	93	75-125	
Chromium	mg/kg	3.3	19.3	21.8	96	75-125	
Copper	mg/kg	139	19.3	128	-56	75-125	M6
Iron	mg/kg	6800	241	12300	2300	75-125	M6
Lead	mg/kg	15.8	19.3	52.5	191	75-125	M6
Manganese	mg/kg	1170	19.3	464	-3680	75-125	M6
Nickel	mg/kg	6.1	19.3	22.8	87	75-125	
Silver	mg/kg	1.0	19.3	20.8	103	75-125	
Zinc	mg/kg	93.2	19.3	132	204	75-125	M6

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(406)254-7226

QUALITY CONTROL DATA

Project: Black Pine Mine
Pace Project No.: 10163643

QC Batch: MERP/5650 Analysis Method: EPA 7471
QC Batch Method: EPA 7471 Analysis Description: 7471 Mercury
Associated Lab Samples: 10163643001, 10163643002, 10163643003, 10163643004, 10163643005, 10163643006, 10163643007, 10163643008, 10163643009

METHOD BLANK: 1016607 Matrix: Solid
Associated Lab Samples: 10163643001, 10163643002, 10163643003, 10163643004, 10163643005, 10163643006, 10163643007, 10163643008, 10163643009

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Mercury	mg/kg	<0.020	0.020	07/31/11 09:25	

LABORATORY CONTROL SAMPLE: 1016608

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Mercury	mg/kg	.44	0.45	103	80-120	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 1016609 1016610

Parameter	Units	10163634009 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Mercury	mg/kg	0.12	.45	.54	0.23	0.31	25	35	80-120	27	20	D6,M1

MATRIX SPIKE SAMPLE: 1016611

Parameter	Units	10163643009 Result	Spike Conc.	MS Result	MS % Rec	% Rec Limits	Qualifiers
Mercury	mg/kg	137	.6	137	14	80-120	M6

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QUALITY CONTROL DATA

Project: Black Pine Mine
Pace Project No.: 10163643

QC Batch: MERP/5651 Analysis Method: EPA 7471
QC Batch Method: EPA 7471 Analysis Description: 7471 Mercury
Associated Lab Samples: 10163643010

METHOD BLANK: 1016612 Matrix: Solid
Associated Lab Samples: 10163643010

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Mercury	mg/kg	<0.018	0.018	08/01/11 13:16	

LABORATORY CONTROL SAMPLE: 1016613

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Mercury	mg/kg	.45	0.46	102	80-120	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 1016614 1016615

Parameter	Units	10163643010 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Mercury	mg/kg	4.1	.62	.65	3.8	3.9	-53	-36	80-120	3	20	M6

MATRIX SPIKE SAMPLE: 1016616

Parameter	Units	10163645009 Result	Spike Conc.	MS Result	MS % Rec	% Rec Limits	Qualifiers
Mercury	mg/kg	0.30	.44	0.47	39	80-120	M1

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QUALITY CONTROL DATA

Project: Black Pine Mine
Pace Project No.: 10163643

QC Batch: MPRP/27293 Analysis Method: % Moisture
QC Batch Method: % Moisture Analysis Description: Dry Weight/Percent Moisture
Associated Lab Samples: 10163643001, 10163643002, 10163643003, 10163643004, 10163643005, 10163643006, 10163643007, 10163643008

SAMPLE DUPLICATE: 1019403

Parameter	Units	10163634006 Result	Dup Result	RPD	Max RPD	Qualifiers
Percent Moisture	%	10.3	11.1	7	30	

SAMPLE DUPLICATE: 1019404

Parameter	Units	10163643008 Result	Dup Result	RPD	Max RPD	Qualifiers
Percent Moisture	%	18.6	18.3	2	30	

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QUALITY CONTROL DATA

Project: Black Pine Mine
Pace Project No.: 10163643

QC Batch: MPRP/27306
QC Batch Method: % Moisture
Analysis Method: % Moisture
Analysis Description: Dry Weight/Percent Moisture
Associated Lab Samples: 10163643009, 10163643010

SAMPLE DUPLICATE: 1019478

Parameter	Units	10163643009 Result	Dup Result	RPD	Max RPD	Qualifiers
Percent Moisture	%	16.2	16.3	1	30	

SAMPLE DUPLICATE: 1019479

Parameter	Units	10163645008 Result	Dup Result	RPD	Max RPD	Qualifiers
Percent Moisture	%	37.2	40.7	9	30	

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QUALITY CONTROL DATA

Project: Black Pine Mine
Pace Project No.: 10163643

QC Batch: MT/6497 Analysis Method: Modified Sobek 3.2
QC Batch Method: Modified Sobek 3.2 Analysis Description: Sobek Acid Base Potential
Associated Lab Samples: 10163643002, 10163643005

METHOD BLANK: 1020551 Matrix: Solid
Associated Lab Samples: 10163643002, 10163643005

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Neutralization Potential	tons/1000	<0.5	0.50	08/01/11 00:00	

SAMPLE DUPLICATE: 1020552

Parameter	Units	10163634001 Result	Dup Result	RPD	Max RPD	Qualifiers
Neutralization Potential	tons/1000	0.73	2.2			

SAMPLE DUPLICATE: 1024994

Parameter	Units	10163640008 Result	Dup Result	RPD	Max RPD	Qualifiers
Neutralization Potential	tons/1000	2.4	5.6			

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QUALITY CONTROL DATA

Project: Black Pine Mine
Pace Project No.: 10163643

QC Batch: MT/6488 Analysis Method: Modified Sobek 3.2
QC Batch Method: Modified Sobek 3.2 Analysis Description: Sobek Extractable Sulfur
Associated Lab Samples: 10163643002, 10163643005

METHOD BLANK: 1019974 Matrix: Solid
Associated Lab Samples: 10163643002, 10163643005

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Total Sulfur	% (w/w)	<0.050	0.050	08/08/11 14:36	

SAMPLE DUPLICATE: 1019976

Parameter	Units	10163634001 Result	Dup Result	RPD	Max RPD	Qualifiers
Total Sulfur	% (w/w)	<0.050	<0.050			

SAMPLE DUPLICATE: 1019977

Parameter	Units	10163643005 Result	Dup Result	RPD	Max RPD	Qualifiers
Total Sulfur	% (w/w)	0.0605	0.0697	14		

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QUALITY CONTROL DATA

Project: Black Pine Mine
Pace Project No.: 10163643

QC Batch: MT/6543
QC Batch Method: Modified Sobek 3.2
Analysis Method: Modified Sobek 3.2
Analysis Description: Sobek SMP Buffer pH
Associated Lab Samples: 10163643002, 10163643005

SAMPLE DUPLICATE: 1022818

Parameter	Units	10163634001 Result	Dup Result	RPD	Max RPD	Qualifiers
SMP Buffer pH	Std. Units	7.3	7.2	.3	20	

SAMPLE DUPLICATE: 1026468

Parameter	Units	10163643005 Result	Dup Result	RPD	Max RPD	Qualifiers
SMP Buffer pH	Std. Units	7.1	7.1	.3	20	

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QUALIFIERS

Project: Black Pine Mine
Pace Project No.: 10163643

DEFINITIONS

DF - Dilution Factor, if reported, represents the factor applied to the reported data due to changes in sample preparation, dilution of the sample aliquot, or moisture content.

ND - Not Detected at or above adjusted reporting limit.

J - Estimated concentration above the adjusted method detection limit and below the adjusted reporting limit.

MDL - Adjusted Method Detection Limit.

S - Surrogate

1,2-Diphenylhydrazine (8270 listed analyte) decomposes to Azobenzene.

Consistent with EPA guidelines, unrounded data are displayed and have been used to calculate % recovery and RPD values.

LCS(D) - Laboratory Control Sample (Duplicate)

MS(D) - Matrix Spike (Duplicate)

DUP - Sample Duplicate

RPD - Relative Percent Difference

NC - Not Calculable.

SG - Silica Gel - Clean-Up

U - Indicates the compound was analyzed for, but not detected.

N-Nitrosodiphenylamine decomposes and cannot be separated from Diphenylamine using Method 8270. The result reported for each analyte is a combined concentration.

LABORATORIES

PASI-M	Pace Analytical Services - Minneapolis
PASI-MT	Pace Analytical Services - Montana

ANALYTE QUALIFIERS

D6	The relative percent difference (RPD) between the sample and sample duplicate exceeded laboratory control limits.
E	Analyte concentration exceeded the calibration range. The reported result is estimated.
M1	Matrix spike recovery exceeded QC limits. Batch accepted based on laboratory control sample (LCS) recovery.
M6	Matrix spike and Matrix spike duplicate recovery not evaluated against control limits due to sample dilution.

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QUALITY CONTROL DATA CROSS REFERENCE TABLE

Project: Black Pine Mine
Pace Project No.: 10163643

Lab ID	Sample ID	QC Batch Method	QC Batch	Analytical Method	Analytical Batch
10163643001	**BP-CML-TS-07-00**	EPA 3050	MPRP/27164	EPA 6020	ICPM/11124
10163643002	**BP-CML-TS-07-02**	EPA 3050	MPRP/27164	EPA 6020	ICPM/11124
10163643003	**BP-CML-SS-07-05**	EPA 3050	MPRP/27164	EPA 6020	ICPM/11124
10163643004	**BP-CML-TS-08-00**	EPA 3050	MPRP/27164	EPA 6020	ICPM/11124
10163643005	**BP-CML-TS-08-05**	EPA 3050	MPRP/27164	EPA 6020	ICPM/11124
10163643006	**BP-CML-SS-08-07**	EPA 3050	MPRP/27164	EPA 6020	ICPM/11124
10163643007	**BP-CML-TS-09-00**	EPA 3050	MPRP/27164	EPA 6020	ICPM/11124
10163643008	**BP-CML-TS-09-02**	EPA 3050	MPRP/27164	EPA 6020	ICPM/11124
10163643009	**BP-CML-TS-09-04**	EPA 3050	MPRP/27164	EPA 6020	ICPM/11124
10163643010	**BP-CML-TS-09-06**	EPA 3050	MPRP/27164	EPA 6020	ICPM/11124
10163643001	**BP-CML-TS-07-00**	EPA 7471	MERP/5650	EPA 7471	MERC/6493
10163643002	**BP-CML-TS-07-02**	EPA 7471	MERP/5650	EPA 7471	MERC/6493
10163643003	**BP-CML-SS-07-05**	EPA 7471	MERP/5650	EPA 7471	MERC/6493
10163643004	**BP-CML-TS-08-00**	EPA 7471	MERP/5650	EPA 7471	MERC/6493
10163643005	**BP-CML-TS-08-05**	EPA 7471	MERP/5650	EPA 7471	MERC/6493
10163643006	**BP-CML-SS-08-07**	EPA 7471	MERP/5650	EPA 7471	MERC/6493
10163643007	**BP-CML-TS-09-00**	EPA 7471	MERP/5650	EPA 7471	MERC/6493
10163643008	**BP-CML-TS-09-02**	EPA 7471	MERP/5650	EPA 7471	MERC/6493
10163643009	**BP-CML-TS-09-04**	EPA 7471	MERP/5650	EPA 7471	MERC/6493
10163643010	**BP-CML-TS-09-06**	EPA 7471	MERP/5651	EPA 7471	MERC/6471
10163643001	**BP-CML-TS-07-00**	% Moisture	MPRP/27293		
10163643002	**BP-CML-TS-07-02**	% Moisture	MPRP/27293		
10163643003	**BP-CML-SS-07-05**	% Moisture	MPRP/27293		
10163643004	**BP-CML-TS-08-00**	% Moisture	MPRP/27293		
10163643005	**BP-CML-TS-08-05**	% Moisture	MPRP/27293		
10163643006	**BP-CML-SS-08-07**	% Moisture	MPRP/27293		
10163643007	**BP-CML-TS-09-00**	% Moisture	MPRP/27293		
10163643008	**BP-CML-TS-09-02**	% Moisture	MPRP/27293		
10163643009	**BP-CML-TS-09-04**	% Moisture	MPRP/27306		
10163643010	**BP-CML-TS-09-06**	% Moisture	MPRP/27306		
10163643002	**BP-CML-TS-07-02**	Modified Sobek 3.2	MT/6497		
10163643005	**BP-CML-TS-08-05**	Modified Sobek 3.2	MT/6497		
10163643002	**BP-CML-TS-07-02**	Modified Sobek 3.2	MT/6488		
10163643005	**BP-CML-TS-08-05**	Modified Sobek 3.2	MT/6488		
10163643002	**BP-CML-TS-07-02**	Modified Sobek 3.2	MT/6501		
10163643005	**BP-CML-TS-08-05**	Modified Sobek 3.2	MT/6501		
10163643002	**BP-CML-TS-07-02**	Modified Sobek 3.2	MT/6543		
10163643005	**BP-CML-TS-08-05**	Modified Sobek 3.2	MT/6543		

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CHAIN-OF-CUSTODY / Analytical Request Document

The Chain-of-Custody is a LEGAL DOCUMENT. All relevant fields must be completed accurately.

Page: 1 of 1

1429995

Section A Required Client Information:

Company: Herrera
Address:
Email To:
Phone: Fax:
Requested Due Date/TAT:

Section B Required Project Information:

Report To: Kevin Houck
Copy To:
Purchase Order No.:
Project Name:
Project Number:

Section C Invoice Information:

Attention:
Company Name: DEQ
Address:
Pace Quote Reference:
Pace Project Manager:
Pace Profile #:

REGULATORY AGENCY

☐ NPDES ☐ GROUND WATER ☐ DRINKING WATER
☐ UST ☐ RCRA ☐ OTHER

Site Location STATE:

Section D Required Client Information

SAMPLE ID
(A-Z, 0-9 / ,-)
Sample IDs MUST BE UNIQUE

Matrix Codes MATRIX / CODE

Drinking Water	DW
Water	WT
Waste Water	WW
Product	P
Soil/Solid	SL
Oil	OL
Wipe	WP
Air	AR
Tissue	TS
Other	OT

ITEM #	SAMPLE ID	MATRIX CODE (see valid codes to left)	SAMPLE TYPE (G=GRAB C=COMP)	COLLECTED COMPOSITE START DATE	COMPOSITE START TIME	COMPOSITE END/GRAB DATE	COMPOSITE END/GRAB TIME	SAMPLE TEMP AT COLLECTION	# OF CONTAINERS	Preservatives: Unpreserved	H_2SO_4	HNO_3	HCl	NaOH	$Na_2S_2O_3$	Methanol	Other	Analysis Test Y/N	Tot. Rec Met	ABA	Moisture content	Residual Chlorine (Y/N)	Pace Project No./ Lab I.D.
1	BP-CML-TS-07-00	SL	G			7/15/11	1232		1	X									X				001
2	BP-CML-TS-07-02	↓	↓			↓	1235		2	X									X	X	X		002
3	BP-CML-SS-07-05						1237		1	X									X				003
4	BP-CML-TS-08-00	SL	G			7/15/11	1255		1	X									X		X		004
5	BP-CML-TS-08-05	↓	↓			↓	1258		2	X									X	X	X		005
6	BP-CML-SS-08-07						1300		1	X									X				006
7	BP-CML-TS-09-00	SL	G			7/15/11	1335		1	X									X				007
8	BP-CML-TS-09-02	↓	↓			↓	1337		1	X									X				008
9	BP-CML-TS-09-04						1339		1	X									X				009
10	BP-CML-TS-09-06	↓	↓			↓	1340		1	X									X				010
11																							
12																							

Requested Analysis Filtered (Y/N)

10163643

ADDITIONAL COMMENTS	RELINQUISHED BY / AFFILIATION	DATE	TIME	ACCEPTED BY / AFFILIATION	DATE	TIME	SAMPLE CONDITIONS: Temp in °C	Received on Ice (Y/N)	Custody Sealed Cooler (Y/N)	Samples Intact (Y/N)
	DD Cox / Herrera	7/15/11	1630	BL Noz / Pace	7/16/11	1136	4.4	Y	Y	X

ORIGINAL

SAMPLER NAME AND SIGNATURE
PRINT Name of SAMPLER:
SIGNATURE of SAMPLER: DATE Signed (MM/DD/YY):

*Important Note: By signing this form you are accepting Pace's NET 30 day payment terms and agreeing to late charges of 1.5% per month for any invoices not paid within 30 days.

F-ALL-Q-020rev.07, 15-May-2007

Sample Condition Upon Receipt

Pace Analytical

Client Name: MDEQ - BLACK PINE Project # 10163643

Courier: [X] Fed Ex [ ] UPS [ ] USPS [ ] Client [ ] Commercial [ ] Pace Other _____

Tracking #: 876249308789

Custody Seal on Cooler/Box Present: [X] yes [ ] no Seals intact: [X] yes [ ] no

Packing Material: [ ] Bubble Wrap [X] Bubble Bags [ ] None [ ] Other _____ Temp Blank: Yes X No _____

Thermometer Used 383045 or 135 Type of Ice: (Wet) Blue None [X] Samples on ice, cooling process has begun

Cooler Temperature 4.4° Biological Tissue is Frozen: Yes No

Temp should be above freezing to 6°C

Date and Initials of person examining contents: NCC 7/17/11

Comments:

Chain of Custody Present:	[X] Yes [ ] No [ ] N/A	1.
Chain of Custody Filled Out:	[X] Yes [ ] No [ ] N/A	2.
Chain of Custody Relinquished:	[X] Yes [ ] No [ ] N/A	3.
Sampler Name & Signature on COC:	[X] Yes [ ] No [ ] N/A	4.
Samples Arrived within Hold Time:	[X] Yes [ ] No [ ] N/A	5.
Short Hold Time Analysis (<72hr):	[ ] Yes [X] No [ ] N/A	6.
Rush Turn Around Time Requested:	[ ] Yes [X] No [ ] N/A	7.
Sufficient Volume:	[X] Yes [ ] No [ ] N/A	8.
Correct Containers Used:	[X] Yes [ ] No [ ] N/A	9.
-Pace Containers Used:	[X] Yes [ ] No [ ] N/A	
Containers Intact:	[X] Yes [ ] No [ ] N/A	10.
Filtered volume received for Dissolved tests	[ ] Yes [ ] No [X] N/A	11.
Sample Labels match COC:	[X] Yes [ ] No [ ] N/A	12.
-Includes date/time/ID/Analysis Matrix: SOIL		
All containers needing acid/base preservation have been checked. Noncompliance are noted in 13.	[ ] Yes [ ] No [X] N/A	13. [ ] HNO3 [ ] H2SO4 [ ] NaOH [ ] HCl
All containers needing preservation are found to be in compliance with EPA recommendation.	[ ] Yes [ ] No [X] N/A	Samp #
Exceptions: VOA,Coliform, TOC, Oil and Grease, WI-DRO (water)	[ ] Yes [X] No	Initial when completed / Lot # of added preservative
Samples checked for dechlorination:	[ ] Yes [ ] No [X] N/A	14.
Headspace in VOA Vials (>6mm):	[ ] Yes [ ] No [X] N/A	15.
Trip Blank Present:	[ ] Yes [ ] No [X] N/A	16.
Trip Blank Custody Seals Present	[ ] Yes [ ] No [X] N/A	
Pace Trip Blank Lot # (if purchased):		

Client Notification/ Resolution: Field Data Required? Y / N

Person Contacted: _____ Date/Time: _____

Comments/ Resolution: _____

Project Manager Review: _____ **Date:** 7/17/11

Note: Whenever there is a discrepancy affecting North Carolina compliance samples, a copy of this form will be sent to the North Carolina DEHNR Certification Office (i.e out of hold, incorrect preservative, out of temp, incorrect containers)

Pace Analytical Services, Inc.
602 S 25th Street
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(406)254-7226

August 11, 2011

Kevin Houck
Herrera Environmental Consultants
101 East Broadway, Suite 610
Missoula, MT 59802

RE: Project: Black Pine Mine
Pace Project No.: 10163644

Dear Kevin Houck:
Enclosed are the analytical results for sample(s) received by the laboratory on July 16, 2011. The results relate only to the samples included in this report.

If you have any questions concerning this report, please feel free to contact me.

Sincerely,

Sally Heinje

sally.heinje@pacelabs.com
Project Manager

Enclosures

cc: Devin Clary, Montana Dept. of Environmental Quality
Mark Donner, Trihydro

REPORT OF LABORATORY ANALYSIS

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CERTIFICATIONS

Project: Black Pine Mine
Pace Project No.: 10163644

Minnesota Certification IDs

1700 Elm Street SE Suite 200, Minneapolis, MN 55414
A2LA Certification #: 2926.01
Alaska Certification #: UST-078
Alaska Certification #MN00064
Arizona Certification #: AZ-0014
Arkansas Certification #: 88-0680
California Certification #: 01155CA
EPA Region 8 Certification #: Pace
Florida/NELAP Certification #: E87605
Georgia Certification #: 959
Idaho Certification #: MN00064
Illinois Certification #: 200011
Iowa Certification #: 368
Kansas Certification #: E-10167
Louisiana Certification #: 03086
Louisiana Certification #: LA080009
Maine Certification #: 2007029
Maryland Certification #: 322
Michigan DEQ Certification #: 9909
Minnesota Certification #: 027-053-137
Mississippi Certification #: Pace
Montana Certification #: MT CERT0092
Nevada Certification #: MN_00064
Nebraska Certification #: Pace
New Jersey Certification #: MN-002
New Mexico Certification #: Pace
New York Certification #: 11647
North Carolina Certification #: 530
North Dakota Certification #: R-036
North Dakota Certification #: R-036A
Ohio VAP Certification #: CL101
Oklahoma Certification #: D9921
Oklahoma Certification #: 9507
Oregon Certification #: MN200001
Pennsylvania Certification #: 68-00563
Puerto Rico Certification
Tennessee Certification #: 02818
Texas Certification #: T104704192
Washington Certification #: C754
Wisconsin Certification #: 999407970

Montana Certification IDs

602 South 25th Street, Billings, MT 59101
EPA Region 8 Certification #: 8TMS-Q
Idaho Certification #: MT00012
Montana Certification #: MT CERT0040
NVLAP Certification #: 101292-0
Minnesota Dept of Health Certification #: 030-999-442

Kansas Certification IDs

9608 Loiret Boulevard, Lenexa, KS 66219
A2LA Certification #: 2456.01
Arkansas Certification #: 05-008-0
Illinois Certification #: 001191
Iowa Certification #: 118
Kansas/NELAP Certification #: E-10116
Louisiana Certification #: 03055
Nevada Certification #: KS000212008A
Oklahoma Certification #: 9205/9935
Texas Certification #: T104704407-08-TX
Utah Certification #: 9135995665

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(406)254-7226

SAMPLE SUMMARY

Project: Black Pine Mine
Pace Project No.: 10163644

Lab ID	Sample ID	Matrix	Date Collected	Date Received
10163644001	**BP-CMN-SS-10-00**	Solid	07/14/11 14:55	07/16/11 11:30
10163644002	**BP-CMN-SS-10-04**	Solid	07/14/11 15:00	07/16/11 11:30
10163644003	**BP-CMN-SS-14-00**	Solid	07/14/11 15:15	07/16/11 11:30
10163644004	**BP-CMN-SS-14-04**	Solid	07/14/11 15:20	07/16/11 11:30
10163644005	**BP-CMN-SS-13-00**	Solid	07/14/11 15:50	07/16/11 11:30
10163644006	**BP-CMN-SS-13-04**	Solid	07/14/11 15:55	07/16/11 11:30
10163644007	**BP-CMN-SS-12-00**	Solid	07/14/11 16:15	07/16/11 11:30
10163644008	**BP-CMN-SS-12-04**	Solid	07/14/11 16:20	07/16/11 11:30
10163644009	**BP-CMN-SS-11-00**	Solid	07/14/11 16:40	07/16/11 11:30
10163644010	**BP-CMN-SS-11-04**	Solid	07/14/11 16:45	07/16/11 11:30

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SAMPLE ANALYTE COUNT

Project: Black Pine Mine
Pace Project No.: 10163644

Lab ID	Sample ID	Method	Analysts	Analytes Reported	Laboratory
10163644001	**BP-CMN-SS-10-00**	EPA 6020	TL1	12	PASI-M
		EPA 7471	TEM	1	PASI-M
		% Moisture	JDL	1	PASI-M
		Modified Sobek 3.2	JH1	1	PASI-MT
		Modified Sobek 3.2	JH1	5	PASI-MT
		Modified Sobek 3.2	JH1	4	PASI-MT
		Modified Sobek 3.2	JH1	1	PASI-MT
10163644002	**BP-CMN-SS-10-04**	EPA 6020	TL1	12	PASI-M
		EPA 7471	TEM	1	PASI-M
		% Moisture	JDL	1	PASI-M
10163644003	**BP-CMN-SS-14-00**	EPA 6020	TL1	12	PASI-M
		EPA 7471	TEM	1	PASI-M
		% Moisture	JDL	1	PASI-M
		Modified Sobek 3.2	JH1	1	PASI-MT
		Modified Sobek 3.2	JH1	5	PASI-MT
		Modified Sobek 3.2	JH1	4	PASI-MT
		Modified Sobek 3.2	KB2	1	PASI-MT
10163644004	**BP-CMN-SS-14-04**	EPA 6020	TL1	12	PASI-M
		EPA 7471	TEM	1	PASI-M
		% Moisture	JDL	1	PASI-M
10163644005	**BP-CMN-SS-13-00**	EPA 6020	TL1	12	PASI-M
		EPA 7471	TEM	1	PASI-M
		% Moisture	JDL	1	PASI-M
		Modified Sobek 3.2	JH1	1	PASI-MT
		Modified Sobek 3.2	JH1	5	PASI-MT
		Modified Sobek 3.2	JH1	4	PASI-MT
		Modified Sobek 3.2	JH1	1	PASI-MT
10163644006	**BP-CMN-SS-13-04**	CLPICPAES	IP	1	PASI-M
		EPA 9081	SMW	1	PASI-K
		EPA 6020	TL1	12	PASI-M
		EPA 7471	TEM	1	PASI-M
		% Moisture	JDL	1	PASI-M
		ASA 33-3.2/EPA 353.2	CAC	1	PASI-MT
		ASTM D421	CAC	1	PASI-MT
		ASA 29-3.5.2	CAC	1	PASI-MT
		ASA 10-3.2	CAC	1	PASI-MT
		ASA 24-5.4/SM4500	SA1	1	PASI-MT

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SAMPLE ANALYTE COUNT

Project: Black Pine Mine
Pace Project No.: 10163644

Lab ID	Sample ID	Method	Analysts	Analytes Reported	Laboratory
		Modified Sobek 3.2	JH1	1	PASI-MT
		Modified Sobek 3.2	JH1	5	PASI-MT
		Modified Sobek 3.2	JH1	4	PASI-MT
		Modified Sobek 3.2	JH1	1	PASI-MT
		ASA 10-3.3	SR1	1	PASI-MT
10163644007	**BP-CMN-SS-12-00**	EPA 6020	TL1	12	PASI-M
		EPA 7471	TEM	1	PASI-M
		% Moisture	JDL	1	PASI-M
		Modified Sobek 3.2	JH1	1	PASI-MT
		Modified Sobek 3.2	JH1	5	PASI-MT
		Modified Sobek 3.2	JH1	4	PASI-MT
		Modified Sobek 3.2	JH1	1	PASI-MT
10163644008	**BP-CMN-SS-12-04**	CLPICPAES	IP	1	PASI-M
		EPA 9081	SMW	1	PASI-K
		EPA 6020	TL1	12	PASI-M
		EPA 7471	TEM	1	PASI-M
		% Moisture	JDL	1	PASI-M
		ASA 33-3.2/EPA 353.2	CAC	1	PASI-MT
		ASTM D421	CAC	1	PASI-MT
		ASA 29-3.5.2	CAC	1	PASI-MT
		ASA 10-3.2	CAC	1	PASI-MT
		ASA 24-5.4/SM4500	SA1	1	PASI-MT
		Modified Sobek 3.2	JH1	1	PASI-MT
		Modified Sobek 3.2	JH1	5	PASI-MT
		Modified Sobek 3.2	JH1	4	PASI-MT
		Modified Sobek 3.2	JH1	1	PASI-MT
		ASA 10-3.3	SR1	1	PASI-MT
10163644009	**BP-CMN-SS-11-00**	EPA 6020	TL1	12	PASI-M
		EPA 7471	TEM	1	PASI-M
		% Moisture	JDL	1	PASI-M
		Modified Sobek 3.2	JH1	1	PASI-MT
		Modified Sobek 3.2	JH1	5	PASI-MT
		Modified Sobek 3.2	JH1	4	PASI-MT
		Modified Sobek 3.2	JH1	1	PASI-MT
10163644010	**BP-CMN-SS-11-04**	CLPICPAES	IP	1	PASI-M
		EPA 9081	SMW	1	PASI-K
		EPA 6020	TL1	12	PASI-M

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SAMPLE ANALYTE COUNT

Project: Black Pine Mine
Pace Project No.: 10163644

Lab ID	Sample ID	Method	Analysts	Analytes Reported	Laboratory
		EPA 7471	TEM	1	PASI-M
		% Moisture	JDL	1	PASI-M
		ASA 33-3.2/EPA 353.2	CAC	1	PASI-MT
		ASTM D421	CAC	1	PASI-MT
		ASA 29-3.5.2	CAC	1	PASI-MT
		ASA 10-3.2	CAC	1	PASI-MT
		ASA 24-5.4/SM4500	SA1	1	PASI-MT
		Modified Sobek 3.2	JH1	1	PASI-MT
		Modified Sobek 3.2	JH1	5	PASI-MT
		Modified Sobek 3.2	JH1	4	PASI-MT
		Modified Sobek 3.2	JH1	1	PASI-MT
		ASA 10-3.3	SR1	1	PASI-MT

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PROJECT NARRATIVE

Project: Black Pine Mine
Pace Project No.: 10163644

Method: **CLPICPAES**
Description: 6010 MET ICP, MDEQ Potassium
Client: Montana Dept. of Environmental Quality
Date: August 11, 2011

General Information:
3 samples were analyzed for CLPICPAES. All samples were received in acceptable condition with any exceptions noted below.

Hold Time:
The samples were analyzed within the method required hold times with any exceptions noted below.

Sample Preparation:
The samples were prepared in accordance with ASA 13-3.5.2.2 with any exceptions noted below.

Initial Calibrations (including MS Tune as applicable):
All criteria were within method requirements with any exceptions noted below.

Continuing Calibration:
All criteria were within method requirements with any exceptions noted below.

Method Blank:
All analytes were below the report limit in the method blank with any exceptions noted below.

Laboratory Control Spike:
All laboratory control spike compounds were within QC limits with any exceptions noted below.

Matrix Spikes:
All percent recoveries and relative percent differences (RPDs) were within acceptance criteria with any exceptions noted below.

Duplicate Sample:
All duplicate sample results were within method acceptance criteria with any exceptions noted below.

Additional Comments:

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PROJECT NARRATIVE

Project: Black Pine Mine
Pace Project No.: 10163644

Method: **EPA 9081**
Description: Cation Exchange Capacity
Client: Montana Dept. of Environmental Quality
Date: August 11, 2011

General Information:
3 samples were analyzed for EPA 9081. All samples were received in acceptable condition with any exceptions noted below.

Hold Time:
The samples were analyzed within the method required hold times with any exceptions noted below.

Initial Calibrations (including MS Tune as applicable):
All criteria were within method requirements with any exceptions noted below.

Continuing Calibration:
All criteria were within method requirements with any exceptions noted below.

Method Blank:
All analytes were below the report limit in the method blank with any exceptions noted below.

Laboratory Control Spike:
All laboratory control spike compounds were within QC limits with any exceptions noted below.

Matrix Spikes:
All percent recoveries and relative percent differences (RPDs) were within acceptance criteria with any exceptions noted below.

Duplicate Sample:
All duplicate sample results were within method acceptance criteria with any exceptions noted below.

Additional Comments:

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PROJECT NARRATIVE

Project: Black Pine Mine
Pace Project No.: 10163644

Method: **EPA 6020**
Description: 6020 MET ICPMS
Client: Montana Dept. of Environmental Quality
Date: August 11, 2011

General Information:
10 samples were analyzed for EPA 6020. All samples were received in acceptable condition with any exceptions noted below.

Hold Time:
The samples were analyzed within the method required hold times with any exceptions noted below.

Sample Preparation:
The samples were prepared in accordance with EPA 3050 with any exceptions noted below.

Initial Calibrations (including MS Tune as applicable):
All criteria were within method requirements with any exceptions noted below.

Continuing Calibration:
All criteria were within method requirements with any exceptions noted below.

Internal Standards:
All internal standards were within QC limits with any exceptions noted below.

Method Blank:
All analytes were below the report limit in the method blank with any exceptions noted below.

Laboratory Control Spike:
All laboratory control spike compounds were within QC limits with any exceptions noted below.

Matrix Spikes:
All percent recoveries and relative percent differences (RPDs) were within acceptance criteria with any exceptions noted below.

QC Batch: MPRP/27164

A matrix spike and matrix spike duplicate (MS/MSD) were performed on the following sample(s): 10163643001,10163644001

M6: Matrix spike and Matrix spike duplicate recovery not evaluated against control limits due to sample dilution.

- MS (Lab ID: 1014840)
  - Antimony
  - Arsenic
  - Barium
  - Copper
  - Iron
  - Lead
  - Manganese
  - Zinc
- MS (Lab ID: 1014842)
  - Antimony
  - Arsenic
  - Barium
  - Copper

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PROJECT NARRATIVE

Project: Black Pine Mine
Pace Project No.: 10163644

Method: **EPA 6020**
Description: 6020 MET ICPMS
Client: Montana Dept. of Environmental Quality
Date: August 11, 2011

QC Batch: MPRP/27164

A matrix spike and matrix spike duplicate (MS/MSD) were performed on the following sample(s): 10163643001,10163644001

M6: Matrix spike and Matrix spike duplicate recovery not evaluated against control limits due to sample dilution.

- Iron
- Lead
- Manganese
- Zinc

- MSD (Lab ID: 1014841)
  - Antimony
  - Arsenic
  - Barium
  - Copper
  - Iron
  - Lead
  - Manganese
  - Nickel
  - Zinc

Duplicate Sample:
All duplicate sample results were within method acceptance criteria with any exceptions noted below.

Additional Comments:

Analyte Comments:

QC Batch: MPRP/27164

E: Analyte concentration exceeded the calibration range. The reported result is estimated.

- MS (Lab ID: 1014840)
  - Copper
  - Lead
- MSD (Lab ID: 1014841)
  - Lead

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PROJECT NARRATIVE

Project: Black Pine Mine
Pace Project No.: 10163644

Method: **EPA 7471**
Description: 7471 Mercury
Client: Montana Dept. of Environmental Quality
Date: August 11, 2011

General Information:
10 samples were analyzed for EPA 7471. All samples were received in acceptable condition with any exceptions noted below.

Hold Time:
The samples were analyzed within the method required hold times with any exceptions noted below.

Sample Preparation:
The samples were prepared in accordance with EPA 7471 with any exceptions noted below.

Initial Calibrations (including MS Tune as applicable):
All criteria were within method requirements with any exceptions noted below.

Continuing Calibration:
All criteria were within method requirements with any exceptions noted below.

Method Blank:
All analytes were below the report limit in the method blank with any exceptions noted below.

Laboratory Control Spike:
All laboratory control spike compounds were within QC limits with any exceptions noted below.

Matrix Spikes:
All percent recoveries and relative percent differences (RPDs) were within acceptance criteria with any exceptions noted below.

QC Batch: MERP/5651

A matrix spike and matrix spike duplicate (MS/MSD) were performed on the following sample(s): 10163643010,10163645009

M1: Matrix spike recovery exceeded QC limits. Batch accepted based on laboratory control sample (LCS) recovery.

- MS (Lab ID: 1016616)
  - Mercury

M6: Matrix spike and Matrix spike duplicate recovery not evaluated against control limits due to sample dilution.

- MS (Lab ID: 1016614)
  - Mercury
- MSD (Lab ID: 1016615)
  - Mercury

Duplicate Sample:
All duplicate sample results were within method acceptance criteria with any exceptions noted below.

Additional Comments:

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PROJECT NARRATIVE

Project: Black Pine Mine
Pace Project No.: 10163644

Method: **ASA 33-3.2/EPA 353.2**
Description: 353.2 Nitrate + Nitrite pres.
Client: Montana Dept. of Environmental Quality
Date: August 11, 2011

General Information:
3 samples were analyzed for ASA 33-3.2/EPA 353.2. All samples were received in acceptable condition with any exceptions noted below.

Hold Time:
The samples were analyzed within the method required hold times with any exceptions noted below.

Initial Calibrations (including MS Tune as applicable):
All criteria were within method requirements with any exceptions noted below.

Continuing Calibration:
All criteria were within method requirements with any exceptions noted below.

Internal Standards:
All internal standards were within QC limits with any exceptions noted below.

Surrogates:
All surrogates were within QC limits with any exceptions noted below.

Method Blank:
All analytes were below the report limit in the method blank with any exceptions noted below.

Laboratory Control Spike:
All laboratory control spike compounds were within QC limits with any exceptions noted below.

Matrix Spikes:
All percent recoveries and relative percent differences (RPDs) were within acceptance criteria with any exceptions noted below.

Duplicate Sample:
All duplicate sample results were within method acceptance criteria with any exceptions noted below.

Additional Comments:

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PROJECT NARRATIVE

Project: Black Pine Mine
Pace Project No.: 10163644

Method: **ASTM D421**
Description: Coarse
Client: Montana Dept. of Environmental Quality
Date: August 11, 2011

General Information:
3 samples were analyzed for ASTM D421. All samples were received in acceptable condition with any exceptions noted below.

Hold Time:
The samples were analyzed within the method required hold times with any exceptions noted below.

Initial Calibrations (including MS Tune as applicable):
All criteria were within method requirements with any exceptions noted below.

Continuing Calibration:
All criteria were within method requirements with any exceptions noted below.

Internal Standards:
All internal standards were within QC limits with any exceptions noted below.

Surrogates:
All surrogates were within QC limits with any exceptions noted below.

Method Blank:
All analytes were below the report limit in the method blank with any exceptions noted below.

Laboratory Control Spike:
All laboratory control spike compounds were within QC limits with any exceptions noted below.

Matrix Spikes:
All percent recoveries and relative percent differences (RPDs) were within acceptance criteria with any exceptions noted below.

Duplicate Sample:
All duplicate sample results were within method acceptance criteria with any exceptions noted below.

Additional Comments:

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PROJECT NARRATIVE

Project: Black Pine Mine
Pace Project No.: 10163644

Method: **ASA 29-3.5.2**
Description: Organic Matter MT ASA 29
Client: Montana Dept. of Environmental Quality
Date: August 11, 2011

General Information:
3 samples were analyzed for ASA 29-3.5.2. All samples were received in acceptable condition with any exceptions noted below.

Hold Time:
The samples were analyzed within the method required hold times with any exceptions noted below.

Initial Calibrations (including MS Tune as applicable):
All criteria were within method requirements with any exceptions noted below.

Continuing Calibration:
All criteria were within method requirements with any exceptions noted below.

Internal Standards:
All internal standards were within QC limits with any exceptions noted below.

Surrogates:
All surrogates were within QC limits with any exceptions noted below.

Method Blank:
All analytes were below the report limit in the method blank with any exceptions noted below.

Laboratory Control Spike:
All laboratory control spike compounds were within QC limits with any exceptions noted below.

Matrix Spikes:
All percent recoveries and relative percent differences (RPDs) were within acceptance criteria with any exceptions noted below.

Duplicate Sample:
All duplicate sample results were within method acceptance criteria with any exceptions noted below.

Additional Comments:

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PROJECT NARRATIVE

Project: Black Pine Mine
Pace Project No.: 10163644

Method: **ASA 10-3.2**
Description: ASA 10-3.2 pH
Client: Montana Dept. of Environmental Quality
Date: August 11, 2011

General Information:
3 samples were analyzed for ASA 10-3.2. All samples were received in acceptable condition with any exceptions noted below.

Hold Time:
The samples were analyzed within the method required hold times with any exceptions noted below.

Initial Calibrations (including MS Tune as applicable):
All criteria were within method requirements with any exceptions noted below.

Continuing Calibration:
All criteria were within method requirements with any exceptions noted below.

Internal Standards:
All internal standards were within QC limits with any exceptions noted below.

Surrogates:
All surrogates were within QC limits with any exceptions noted below.

Method Blank:
All analytes were below the report limit in the method blank with any exceptions noted below.

Laboratory Control Spike:
All laboratory control spike compounds were within QC limits with any exceptions noted below.

Matrix Spikes:
All percent recoveries and relative percent differences (RPDs) were within acceptance criteria with any exceptions noted below.

Duplicate Sample:
All duplicate sample results were within method acceptance criteria with any exceptions noted below.

Additional Comments:

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PROJECT NARRATIVE

Project: Black Pine Mine
Pace Project No.: 10163644

Method: **ASA 24-5.4/SM4500**
Description: SM4500P-E, Total Phosphorus
Client: Montana Dept. of Environmental Quality
Date: August 11, 2011

General Information:
3 samples were analyzed for ASA 24-5.4/SM4500. All samples were received in acceptable condition with any exceptions noted below.

Hold Time:
The samples were analyzed within the method required hold times with any exceptions noted below.

Initial Calibrations (including MS Tune as applicable):
All criteria were within method requirements with any exceptions noted below.

Continuing Calibration:
All criteria were within method requirements with any exceptions noted below.

Internal Standards:
All internal standards were within QC limits with any exceptions noted below.

Surrogates:
All surrogates were within QC limits with any exceptions noted below.

Method Blank:
All analytes were below the report limit in the method blank with any exceptions noted below.

Laboratory Control Spike:
All laboratory control spike compounds were within QC limits with any exceptions noted below.

Matrix Spikes:
All percent recoveries and relative percent differences (RPDs) were within acceptance criteria with any exceptions noted below.

Duplicate Sample:
All duplicate sample results were within method acceptance criteria with any exceptions noted below.

Additional Comments:

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PROJECT NARRATIVE

Project: Black Pine Mine
Pace Project No.: 10163644

Method: **Modified Sobek 3.2**
Description: Sobek Acid Base Potential
Client: Montana Dept. of Environmental Quality
Date: August 11, 2011

General Information:
8 samples were analyzed for Modified Sobek 3.2. All samples were received in acceptable condition with any exceptions noted below.

Hold Time:
The samples were analyzed within the method required hold times with any exceptions noted below.

Initial Calibrations (including MS Tune as applicable):
All criteria were within method requirements with any exceptions noted below.

Continuing Calibration:
All criteria were within method requirements with any exceptions noted below.

Internal Standards:
All internal standards were within QC limits with any exceptions noted below.

Surrogates:
All surrogates were within QC limits with any exceptions noted below.

Method Blank:
All analytes were below the report limit in the method blank with any exceptions noted below.

Laboratory Control Spike:
All laboratory control spike compounds were within QC limits with any exceptions noted below.

Matrix Spikes:
All percent recoveries and relative percent differences (RPDs) were within acceptance criteria with any exceptions noted below.

Duplicate Sample:
All duplicate sample results were within method acceptance criteria with any exceptions noted below.

Additional Comments:

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PROJECT NARRATIVE

Project: Black Pine Mine
Pace Project No.: 10163644

Method: **Modified Sobek 3.2**
Description: Sobek Extractable Sulfur
Client: Montana Dept. of Environmental Quality
Date: August 11, 2011

General Information:
8 samples were analyzed for Modified Sobek 3.2. All samples were received in acceptable condition with any exceptions noted below.

Hold Time:
The samples were analyzed within the method required hold times with any exceptions noted below.

Initial Calibrations (including MS Tune as applicable):
All criteria were within method requirements with any exceptions noted below.

Continuing Calibration:
All criteria were within method requirements with any exceptions noted below.

Internal Standards:
All internal standards were within QC limits with any exceptions noted below.

Surrogates:
All surrogates were within QC limits with any exceptions noted below.

Method Blank:
All analytes were below the report limit in the method blank with any exceptions noted below.

Laboratory Control Spike:
All laboratory control spike compounds were within QC limits with any exceptions noted below.

Matrix Spikes:
All percent recoveries and relative percent differences (RPDs) were within acceptance criteria with any exceptions noted below.

Duplicate Sample:
All duplicate sample results were within method acceptance criteria with any exceptions noted below.

Additional Comments:

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PROJECT NARRATIVE

Project: Black Pine Mine
Pace Project No.: 10163644

Method: **Modified Sobek 3.2**
Description: Sobek Calculations
Client: Montana Dept. of Environmental Quality
Date: August 11, 2011

General Information:
8 samples were analyzed for Modified Sobek 3.2. All samples were received in acceptable condition with any exceptions noted below.

Hold Time:
The samples were analyzed within the method required hold times with any exceptions noted below.

Initial Calibrations (including MS Tune as applicable):
All criteria were within method requirements with any exceptions noted below.

Continuing Calibration:
All criteria were within method requirements with any exceptions noted below.

Internal Standards:
All internal standards were within QC limits with any exceptions noted below.

Surrogates:
All surrogates were within QC limits with any exceptions noted below.

Method Blank:
All analytes were below the report limit in the method blank with any exceptions noted below.

Laboratory Control Spike:
All laboratory control spike compounds were within QC limits with any exceptions noted below.

Matrix Spikes:
All percent recoveries and relative percent differences (RPDs) were within acceptance criteria with any exceptions noted below.

Duplicate Sample:
All duplicate sample results were within method acceptance criteria with any exceptions noted below.

Additional Comments:

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PROJECT NARRATIVE

Project: Black Pine Mine
Pace Project No.: 10163644

Method: **Modified Sobek 3.2**
Description: Sobek SMP Buffer pH
Client: Montana Dept. of Environmental Quality
Date: August 11, 2011

General Information:
8 samples were analyzed for Modified Sobek 3.2. All samples were received in acceptable condition with any exceptions noted below.

Hold Time:
The samples were analyzed within the method required hold times with any exceptions noted below.

Initial Calibrations (including MS Tune as applicable):
All criteria were within method requirements with any exceptions noted below.

Continuing Calibration:
All criteria were within method requirements with any exceptions noted below.

Internal Standards:
All internal standards were within QC limits with any exceptions noted below.

Surrogates:
All surrogates were within QC limits with any exceptions noted below.

Method Blank:
All analytes were below the report limit in the method blank with any exceptions noted below.

Laboratory Control Spike:
All laboratory control spike compounds were within QC limits with any exceptions noted below.

Matrix Spikes:
All percent recoveries and relative percent differences (RPDs) were within acceptance criteria with any exceptions noted below.

Duplicate Sample:
All duplicate sample results were within method acceptance criteria with any exceptions noted below.

Additional Comments:

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PROJECT NARRATIVE

Project: Black Pine Mine
Pace Project No.: 10163644

Method: **ASA 10-3.3**
Description: ASA10-3.3 Specific Conductance
Client: Montana Dept. of Environmental Quality
Date: August 11, 2011

General Information:
3 samples were analyzed for ASA 10-3.3. All samples were received in acceptable condition with any exceptions noted below.

Hold Time:
The samples were analyzed within the method required hold times with any exceptions noted below.

Initial Calibrations (including MS Tune as applicable):
All criteria were within method requirements with any exceptions noted below.

Continuing Calibration:
All criteria were within method requirements with any exceptions noted below.

Internal Standards:
All internal standards were within QC limits with any exceptions noted below.

Surrogates:
All surrogates were within QC limits with any exceptions noted below.

Method Blank:
All analytes were below the report limit in the method blank with any exceptions noted below.

Laboratory Control Spike:
All laboratory control spike compounds were within QC limits with any exceptions noted below.

Matrix Spikes:
All percent recoveries and relative percent differences (RPDs) were within acceptance criteria with any exceptions noted below.

Duplicate Sample:
All duplicate sample results were within method acceptance criteria with any exceptions noted below.

QC Batch: MT/6547

D6: The relative percent difference (RPD) between the sample and sample duplicate exceeded laboratory control limits.

- DUP (Lab ID: 1022943)
  - Sp.Conductance Saturated Paste

Additional Comments:

This data package has been reviewed for quality and completeness and is approved for release.

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ANALYTICAL RESULTS

Project: Black Pine Mine
Pace Project No.: 10163644

Sample: BP-CMN-SS-10-00 **Lab ID: 10163644001** Collected: 07/14/11 14:55 Received: 07/16/11 11:30 Matrix: Solid

Results reported on a "dry-weight" basis

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
6020 MET ICPMS	Analytical Method: EPA 6020 Preparation Method: EPA 3050							
Antimony	**15.0**	mg/kg	0.41	20	07/25/11 09:00	07/29/11 20:41	7440-36-0	M6
Arsenic	**8.6**	mg/kg	0.41	20	07/25/11 09:00	07/29/11 20:41	7440-38-2	M6
Barium	**237**	mg/kg	0.25	20	07/25/11 09:00	07/29/11 20:41	7440-39-3	M6
Cadmium	**1.4**	mg/kg	0.066	20	07/25/11 09:00	07/29/11 20:41	7440-43-9	
Chromium	**3.3**	mg/kg	0.41	20	07/25/11 09:00	07/29/11 20:41	7440-47-3	
Copper	**139**	mg/kg	0.41	20	07/25/11 09:00	07/29/11 20:41	7440-50-8	M6
Iron	**6800**	mg/kg	41.4	20	07/25/11 09:00	07/29/11 20:41	7439-89-6	M6
Lead	**15.8**	mg/kg	0.083	20	07/25/11 09:00	07/29/11 20:41	7439-92-1	M6
Manganese	**1170**	mg/kg	2.1	100	07/25/11 09:00	07/29/11 20:44	7439-96-5	M6
Nickel	**6.1**	mg/kg	0.41	20	07/25/11 09:00	07/29/11 20:41	7440-02-0	
Silver	**1.0**	mg/kg	1.0	50	07/25/11 09:00	07/30/11 21:06	7440-22-4	
Zinc	**93.2**	mg/kg	4.1	20	07/25/11 09:00	07/29/11 20:41	7440-66-6	M6
7471 Mercury	Analytical Method: EPA 7471 Preparation Method: EPA 7471							
Mercury	**0.044**	mg/kg	0.020	1	07/22/11 14:31	08/01/11 13:46	7439-97-6	
Dry Weight	Analytical Method: % Moisture							
Percent Moisture	**15.0**	%	0.10	1		07/25/11 00:00		
Sobek Acid Base Potential	Analytical Method: Modified Sobek 3.2							
Neutralization Potential	**2.4**	tons/1000	0.50	1		08/01/11 00:00		
Sobek Extractable Sulfur	Analytical Method: Modified Sobek 3.2							
Sulfur, HCl Extractable	**<0.050**	% (w/w)	0.050	1		08/09/11 08:54		
Sulfur, HNO3 Extractable	**<0.050**	% (w/w)	0.050	1		08/09/11 08:54		
Sulfur, Hot Water Extractable	**<0.050**	% (w/w)	0.050	1		08/09/11 08:54		
Sulfur, Residual	**<0.050**	% (w/w)	0.050	1		08/09/11 08:54		
Total Sulfur	**<0.050**	% (w/w)	0.050	1		08/09/11 08:54		
Sobek Calculations	Analytical Method: Modified Sobek 3.2							
Acid/Base Potential	**2.4**	tons/1000		1		08/01/11 00:00		
Acid Potential	**<4.3**	tons/1000	4.3	1		08/01/11 00:00		
Lime Requirement	**<5.4**	tons/1000	5.4	1		08/01/11 00:00		
SMP Lime Requirement	**2.4**	tons/1000	0.0	1		08/01/11 00:00		
Sobek SMP Buffer pH	Analytical Method: Modified Sobek 3.2							
SMP Buffer pH	**6.6**	Std. Units	0.10	1		07/29/11 13:24		

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ANALYTICAL RESULTS

Project: Black Pine Mine
Pace Project No.: 10163644

Sample: BP-CMN-SS-10-04 **Lab ID: 10163644002** Collected: 07/14/11 15:00 Received: 07/16/11 11:30 Matrix: Solid

Results reported on a "dry-weight" basis

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
6020 MET ICPMS	Analytical Method: EPA 6020 Preparation Method: EPA 3050							
Antimony	**5.4**	mg/kg	0.60	20	07/25/11 09:00	07/29/11 20:48	7440-36-0	
Arsenic	**14.1**	mg/kg	0.60	20	07/25/11 09:00	07/29/11 20:48	7440-38-2	
Barium	**136**	mg/kg	0.36	20	07/25/11 09:00	07/29/11 20:48	7440-39-3	
Cadmium	**0.32**	mg/kg	0.095	20	07/25/11 09:00	07/29/11 20:48	7440-43-9	
Chromium	**4.8**	mg/kg	0.60	20	07/25/11 09:00	07/29/11 20:48	7440-47-3	
Copper	**38.1**	mg/kg	0.60	20	07/25/11 09:00	07/29/11 20:48	7440-50-8	
Iron	**17100**	mg/kg	59.6	20	07/25/11 09:00	07/29/11 20:48	7439-89-6	
Lead	**24.9**	mg/kg	0.12	20	07/25/11 09:00	07/29/11 20:48	7439-92-1	
Manganese	**510**	mg/kg	0.60	20	07/25/11 09:00	07/29/11 20:48	7439-96-5	
Nickel	**7.8**	mg/kg	0.60	20	07/25/11 09:00	07/29/11 20:48	7440-02-0	
Silver	**<1.5**	mg/kg	1.5	50	07/25/11 09:00	07/30/11 21:09	7440-22-4	
Zinc	**44.8**	mg/kg	6.0	20	07/25/11 09:00	07/29/11 20:48	7440-66-6	
7471 Mercury	Analytical Method: EPA 7471 Preparation Method: EPA 7471							
Mercury	**0.043**	mg/kg	0.021	1	07/22/11 14:31	08/01/11 13:48	7439-97-6	
Dry Weight	Analytical Method: % Moisture							
Percent Moisture	**20.1**	%	0.10	1		07/25/11 00:00		

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ANALYTICAL RESULTS

Project: Black Pine Mine
Pace Project No.: 10163644

Sample: BP-CMN-SS-14-00 **Lab ID: 10163644003** Collected: 07/14/11 15:15 Received: 07/16/11 11:30 Matrix: Solid

Results reported on a "dry-weight" basis

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
6020 MET ICPMS	Analytical Method: EPA 6020 Preparation Method: EPA 3050							
Antimony	**3.1**	mg/kg	0.50	20	07/25/11 09:00	07/29/11 20:55	7440-36-0	
Arsenic	**19.1**	mg/kg	2.5	100	07/25/11 09:00	07/29/11 21:13	7440-38-2	
Barium	**177**	mg/kg	0.30	20	07/25/11 09:00	07/29/11 20:55	7440-39-3	
Cadmium	**2.8**	mg/kg	0.079	20	07/25/11 09:00	07/29/11 20:55	7440-43-9	
Chromium	**6.8**	mg/kg	0.50	20	07/25/11 09:00	07/29/11 20:55	7440-47-3	
Copper	**321**	mg/kg	2.5	100	07/25/11 09:00	07/29/11 21:13	7440-50-8	
Iron	**15700**	mg/kg	49.5	20	07/25/11 09:00	07/29/11 20:55	7439-89-6	
Lead	**19.3**	mg/kg	0.099	20	07/25/11 09:00	07/29/11 20:55	7439-92-1	
Manganese	**298**	mg/kg	0.50	20	07/25/11 09:00	07/29/11 20:55	7439-96-5	
Nickel	**6.7**	mg/kg	2.5	100	07/25/11 09:00	07/29/11 21:13	7440-02-0	
Silver	**<1.2**	mg/kg	1.2	50	07/25/11 09:00	07/30/11 21:13	7440-22-4	
Zinc	**163**	mg/kg	24.8	100	07/25/11 09:00	07/29/11 21:13	7440-66-6	
7471 Mercury	Analytical Method: EPA 7471 Preparation Method: EPA 7471							
Mercury	**0.13**	mg/kg	0.024	1	07/22/11 14:31	08/01/11 13:50	7439-97-6	
Dry Weight	Analytical Method: % Moisture							
Percent Moisture	**30.4**	%	0.10	1		07/25/11 00:00		
Sobek Acid Base Potential	Analytical Method: Modified Sobek 3.2							
Neutralization Potential	**1.5**	tons/1000	0.50	1		08/01/11 00:00		
Sobek Extractable Sulfur	Analytical Method: Modified Sobek 3.2							
Sulfur, HCl Extractable	**<0.050**	% (w/w)	0.050	1		08/09/11 09:09		
Sulfur, HNO3 Extractable	**<0.050**	% (w/w)	0.050	1		08/09/11 09:09		
Sulfur, Hot Water Extractable	**<0.050**	% (w/w)	0.050	1		08/09/11 09:09		
Sulfur, Residual	**<0.050**	% (w/w)	0.050	1		08/09/11 09:09		
Total Sulfur	**<0.050**	% (w/w)	0.050	1		08/09/11 09:09		
Sobek Calculations	Analytical Method: Modified Sobek 3.2							
Acid/Base Potential	**1.5**	tons/1000		1		08/01/11 00:00		
Acid Potential	**<4.3**	tons/1000	4.3	1		08/01/11 00:00		
Lime Requirement	**8.3**	tons/1000	5.4	1		08/01/11 00:00		
SMP Lime Requirement	**6.0**	tons/1000	0.0	1		08/01/11 00:00		
Sobek SMP Buffer pH	Analytical Method: Modified Sobek 3.2							
SMP Buffer pH	**6.0**	Std. Units	0.10	1		07/29/11 03:24		

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ANALYTICAL RESULTS

Project: Black Pine Mine
Pace Project No.: 10163644

Sample: BP-CMN-SS-14-04 **Lab ID: 10163644004** Collected: 07/14/11 15:20 Received: 07/16/11 11:30 Matrix: Solid

Results reported on a "dry-weight" basis

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
6020 MET ICPMS	Analytical Method: EPA 6020 Preparation Method: EPA 3050							
Antimony	**17.4**	mg/kg	0.57	20	07/25/11 09:00	07/29/11 21:16	7440-36-0	
Arsenic	**19.9**	mg/kg	0.57	20	07/25/11 09:00	07/29/11 21:16	7440-38-2	
Barium	**312**	mg/kg	0.34	20	07/25/11 09:00	07/29/11 21:16	7440-39-3	
Cadmium	**6.9**	mg/kg	0.091	20	07/25/11 09:00	07/29/11 21:16	7440-43-9	
Chromium	**4.3**	mg/kg	0.57	20	07/25/11 09:00	07/29/11 21:16	7440-47-3	
Copper	**917**	mg/kg	2.8	100	07/25/11 09:00	07/29/11 21:20	7440-50-8	
Iron	**7080**	mg/kg	56.9	20	07/25/11 09:00	07/29/11 21:16	7439-89-6	
Lead	**108**	mg/kg	0.11	20	07/25/11 09:00	07/29/11 21:16	7439-92-1	
Manganese	**602**	mg/kg	2.8	100	07/25/11 09:00	07/29/11 21:20	7439-96-5	
Nickel	**7.3**	mg/kg	0.57	20	07/25/11 09:00	07/29/11 21:16	7440-02-0	
Silver	**3.7**	mg/kg	0.57	20	07/25/11 09:00	07/29/11 21:16	7440-22-4	
Zinc	**279**	mg/kg	5.7	20	07/25/11 09:00	07/29/11 21:16	7440-66-6	
7471 Mercury	Analytical Method: EPA 7471 Preparation Method: EPA 7471							
Mercury	**0.022**	mg/kg	0.022	1	07/22/11 14:31	08/01/11 13:56	7439-97-6	
Dry Weight	Analytical Method: % Moisture							
Percent Moisture	**15.6**	%	0.10	1		07/25/11 00:00		

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ANALYTICAL RESULTS

Project: Black Pine Mine
Pace Project No.: 10163644

Sample: BP-CMN-SS-13-00 **Lab ID: 10163644005** Collected: 07/14/11 15:50 Received: 07/16/11 11:30 Matrix: Solid

Results reported on a "dry-weight" basis

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
6020 MET ICPMS	Analytical Method: EPA 6020 Preparation Method: EPA 3050							
Antimony	**396**	mg/kg	0.59	20	07/25/11 09:00	07/29/11 21:23	7440-36-0	
Arsenic	**250**	mg/kg	0.59	20	07/25/11 09:00	07/29/11 21:23	7440-38-2	
Barium	**254**	mg/kg	0.35	20	07/25/11 09:00	07/29/11 21:23	7440-39-3	
Cadmium	**11.2**	mg/kg	0.095	20	07/25/11 09:00	07/29/11 21:23	7440-43-9	
Chromium	**<3.0**	mg/kg	3.0	100	07/25/11 09:00	07/29/11 21:27	7440-47-3	
Copper	**885**	mg/kg	3.0	100	07/25/11 09:00	07/29/11 21:27	7440-50-8	
Iron	**11700**	mg/kg	59.1	20	07/25/11 09:00	07/29/11 21:23	7439-89-6	
Lead	**1890**	mg/kg	0.59	100	07/25/11 09:00	07/29/11 21:27	7439-92-1	
Manganese	**540**	mg/kg	3.0	100	07/25/11 09:00	07/29/11 21:27	7439-96-5	
Nickel	**5.8**	mg/kg	3.0	100	07/25/11 09:00	07/29/11 21:27	7440-02-0	
Silver	**70.8**	mg/kg	0.59	20	07/25/11 09:00	07/29/11 21:23	7440-22-4	
Zinc	**877**	mg/kg	29.6	100	07/25/11 09:00	07/29/11 21:27	7440-66-6	
7471 Mercury	Analytical Method: EPA 7471 Preparation Method: EPA 7471							
Mercury	**1.4**	mg/kg	0.031	1	07/22/11 14:31	08/01/11 13:58	7439-97-6	
Dry Weight	Analytical Method: % Moisture							
Percent Moisture	**33.9**	%	0.10	1		07/25/11 00:00		
Sobek Acid Base Potential	Analytical Method: Modified Sobek 3.2							
Neutralization Potential	**1.5**	tons/1000	0.50	1		08/01/11 00:00		
Sobek Extractable Sulfur	Analytical Method: Modified Sobek 3.2							
Sulfur, HCl Extractable	**<0.050**	% (w/w)	0.050	1		08/09/11 09:19		
Sulfur, HNO3 Extractable	**<0.050**	% (w/w)	0.050	1		08/09/11 09:19		
Sulfur, Hot Water Extractable	**<0.050**	% (w/w)	0.050	1		08/09/11 09:19		
Sulfur, Residual	**<0.050**	% (w/w)	0.050	1		08/09/11 09:19		
Total Sulfur	**0.0751**	% (w/w)	0.050	1		08/09/11 09:19		
Sobek Calculations	Analytical Method: Modified Sobek 3.2							
Acid/Base Potential	**1.5**	tons/1000		1		08/01/11 00:00		
Acid Potential	**<4.3**	tons/1000	4.3	1		08/01/11 00:00		
Lime Requirement	**13**	tons/1000	5.4	1		08/01/11 00:00		
SMP Lime Requirement	**8.9**	tons/1000	0.0	1		08/01/11 00:00		
Sobek SMP Buffer pH	Analytical Method: Modified Sobek 3.2							
SMP Buffer pH	**5.7**	Std. Units	0.10	1		07/29/11 13:24		

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ANALYTICAL RESULTS

Project: Black Pine Mine
Pace Project No.: 10163644

Sample: BP-CMN-SS-13-04 **Lab ID: 10163644006** Collected: 07/14/11 15:55 Received: 07/16/11 11:30 Matrix: Solid

Results reported on a "dry-weight" basis

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
6010 MET ICP, MDEQ Potassium	Analytical Method: CLPICPAES Preparation Method: ASA 13-3.5.2.2							
Potassium	**<121**	mg/kg	121	5	08/01/11 17:34	08/01/11 19:16	7440-09-7	
Cation Exchange Capacity	Analytical Method: EPA 9081							
Cation Exchange Capacity	**24.6**	meq/100g	1.0	10	08/03/11 14:00	08/05/11 13:57		
6020 MET ICPMS	Analytical Method: EPA 6020 Preparation Method: EPA 3050							
Antimony	**2.4**	mg/kg	0.58	20	07/25/11 09:00	07/29/11 21:30	7440-36-0	
Arsenic	**8.3**	mg/kg	2.9	100	07/25/11 09:00	07/29/11 21:34	7440-38-2	
Barium	**173**	mg/kg	0.35	20	07/25/11 09:00	07/29/11 21:30	7440-39-3	
Cadmium	**<0.093**	mg/kg	0.093	20	07/25/11 09:00	07/29/11 21:30	7440-43-9	
Chromium	**9.4**	mg/kg	2.9	100	07/25/11 09:00	07/29/11 21:34	7440-47-3	
Copper	**14.5**	mg/kg	2.9	100	07/25/11 09:00	07/29/11 21:34	7440-50-8	
Iron	**13400**	mg/kg	58.0	20	07/25/11 09:00	07/29/11 21:30	7439-89-6	
Lead	**24.4**	mg/kg	0.12	20	07/25/11 09:00	07/29/11 21:30	7439-92-1	
Manganese	**170**	mg/kg	2.9	100	07/25/11 09:00	07/29/11 21:34	7439-96-5	
Nickel	**8.0**	mg/kg	2.9	100	07/25/11 09:00	07/29/11 21:34	7440-02-0	
Silver	**0.91**	mg/kg	0.58	20	07/25/11 09:00	07/29/11 21:30	7440-22-4	
Zinc	**41.4**	mg/kg	29.0	100	07/25/11 09:00	07/29/11 21:34	7440-66-6	
7471 Mercury	Analytical Method: EPA 7471 Preparation Method: EPA 7471							
Mercury	**0.026**	mg/kg	0.022	1	07/22/11 14:31	08/01/11 14:00	7439-97-6	
Dry Weight	Analytical Method: % Moisture							
Percent Moisture	**20.2**	%	0.10	1		07/25/11 00:00		
353.2 Nitrate + Nitrite pres.	Analytical Method: ASA 33-3.2/EPA 353.2							
Available Nitrate	**<5.0**	mg/kg	5.0	1		07/26/11 18:15		
Coarse	Analytical Method: ASTM D421							
Coarse Fragment	**33.4**	% (w/w)	0.10	1		07/26/11 12:15		
Organic Matter MT ASA 29	Analytical Method: ASA 29-3.5.2							
Organic Matter	**<0.10**	% (w/w)	0.10	1		07/21/11 16:50		
ASA 10-3.2 pH	Analytical Method: ASA 10-3.2							
pH, Saturated Paste	**7.2**	Std. Units	0.10	1		07/27/11 17:38		
SM4500P-E, Total Phosphorus	Analytical Method: ASA 24-5.4/SM4500							
Available Phosphorus	**1.4**	mg/kg	1.0	1		07/25/11 14:48	7723-14-0	
Sobek Acid Base Potential	Analytical Method: Modified Sobek 3.2							
Neutralization Potential	**3.3**	tons/1000	0.50	1		07/29/11 00:00		

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ANALYTICAL RESULTS

Project: Black Pine Mine
Pace Project No.: 10163644

Sample: BP-CMN-SS-13-04 **Lab ID: 10163644006** Collected: 07/14/11 15:55 Received: 07/16/11 11:30 Matrix: Solid

Results reported on a "dry-weight" basis

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
Sobek Extractable Sulfur	Analytical Method: Modified Sobek 3.2							
Sulfur, HCl Extractable	**<0.050**	% (w/w)	0.050	1		07/26/11 15:00		
Sulfur, HNO3 Extractable	**<0.050**	% (w/w)	0.050	1		07/26/11 15:00		
Sulfur, Hot Water Extractable	**<0.050**	% (w/w)	0.050	1		07/26/11 15:00		
Sulfur, Residual	**<0.050**	% (w/w)	0.050	1		07/26/11 15:00		
Total Sulfur	**<0.050**	% (w/w)	0.050	1		07/26/11 15:00		
Sobek Calculations	Analytical Method: Modified Sobek 3.2							
Acid/Base Potential	**3.3**	tons/1000		1		07/26/11 15:00		
Acid Potential	**<4.3**	tons/1000	4.3	1		07/26/11 15:00		
Lime Requirement	**<5.4**	tons/1000	5.4	1		07/26/11 15:00		
SMP Lime Requirement	**0.3**	tons/1000	0.0	1		07/26/11 15:00		
Sobek SMP Buffer pH	Analytical Method: Modified Sobek 3.2							
SMP Buffer pH	**6.9**	Std. Units	0.10	1		07/26/11 15:00		
ASA10-3.3 Specific Conductance	Analytical Method: ASA 10-3.3							
Sp.Conductance Saturated Paste	**204**	mmhos/cm	0.010	1		08/03/11 19:49		

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ANALYTICAL RESULTS

Project: Black Pine Mine
Pace Project No.: 10163644

Sample: BP-CMN-SS-12-00 **Lab ID: 10163644007** Collected: 07/14/11 16:15 Received: 07/16/11 11:30 Matrix: Solid

Results reported on a "dry-weight" basis

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
6020 MET ICPMS	Analytical Method: EPA 6020 Preparation Method: EPA 3050							
Antimony	**9.1**	mg/kg	0.60	20	07/25/11 09:00	07/29/11 21:37	7440-36-0	
Arsenic	**12.3**	mg/kg	3.0	100	07/25/11 09:00	07/29/11 21:41	7440-38-2	
Barium	**160**	mg/kg	0.36	20	07/25/11 09:00	07/29/11 21:37	7440-39-3	
Cadmium	**1.1**	mg/kg	0.097	20	07/25/11 09:00	07/29/11 21:37	7440-43-9	
Chromium	**4.3**	mg/kg	3.0	100	07/25/11 09:00	07/29/11 21:41	7440-47-3	
Copper	**105**	mg/kg	3.0	100	07/25/11 09:00	07/29/11 21:41	7440-50-8	
Iron	**6400**	mg/kg	60.3	20	07/25/11 09:00	07/29/11 21:37	7439-89-6	
Lead	**59.0**	mg/kg	0.12	20	07/25/11 09:00	07/29/11 21:37	7439-92-1	
Manganese	**316**	mg/kg	3.0	100	07/25/11 09:00	07/29/11 21:41	7439-96-5	
Nickel	**14.8**	mg/kg	3.0	100	07/25/11 09:00	07/29/11 21:41	7440-02-0	
Silver	**2.0**	mg/kg	0.60	20	07/25/11 09:00	07/29/11 21:37	7440-22-4	
Zinc	**127**	mg/kg	30.2	100	07/25/11 09:00	07/29/11 21:41	7440-66-6	
7471 Mercury	Analytical Method: EPA 7471 Preparation Method: EPA 7471							
Mercury	**0.062**	mg/kg	0.024	1	07/22/11 14:31	08/01/11 14:02	7439-97-6	
Dry Weight	Analytical Method: % Moisture							
Percent Moisture	**20.3**	%	0.10	1		07/25/11 00:00		
Sobek Acid Base Potential	Analytical Method: Modified Sobek 3.2							
Neutralization Potential	**2.2**	tons/1000	0.50	1		08/01/11 00:00		
Sobek Extractable Sulfur	Analytical Method: Modified Sobek 3.2							
Sulfur, HCl Extractable	**<0.050**	% (w/w)	0.050	1		08/09/11 09:31		
Sulfur, HNO3 Extractable	**<0.050**	% (w/w)	0.050	1		08/09/11 09:31		
Sulfur, Hot Water Extractable	**<0.050**	% (w/w)	0.050	1		08/09/11 09:31		
Sulfur, Residual	**<0.050**	% (w/w)	0.050	1		08/09/11 09:31		
Total Sulfur	**<0.050**	% (w/w)	0.050	1		08/09/11 09:31		
Sobek Calculations	Analytical Method: Modified Sobek 3.2							
Acid/Base Potential	**2.2**	tons/1000		1		08/01/11 00:00		
Acid Potential	**<4.3**	tons/1000	4.3	1		08/01/11 00:00		
Lime Requirement	**<5.4**	tons/1000	5.4	1		08/01/11 00:00		
SMP Lime Requirement	**1.0**	tons/1000	0.0	1		08/01/11 00:00		
Sobek SMP Buffer pH	Analytical Method: Modified Sobek 3.2							
SMP Buffer pH	**6.8**	Std. Units	0.10	1		07/29/11 13:24		

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ANALYTICAL RESULTS

Project: Black Pine Mine
Pace Project No.: 10163644

Sample: BP-CMN-SS-12-04 **Lab ID: 10163644008** Collected: 07/14/11 16:20 Received: 07/16/11 11:30 Matrix: Solid

Results reported on a "dry-weight" basis

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
6010 MET ICP, MDEQ Potassium	Analytical Method: CLPICPAES Preparation Method: ASA 13-3.5.2.2							
Potassium	**<120**	mg/kg	120	5	08/01/11 17:34	08/01/11 19:20	7440-09-7	
Cation Exchange Capacity	Analytical Method: EPA 9081							
Cation Exchange Capacity	**23.0**	meq/100g	0.98	10	08/03/11 14:00	08/05/11 14:00		
6020 MET ICPMS	Analytical Method: EPA 6020 Preparation Method: EPA 3050							
Antimony	**2.1**	mg/kg	0.50	20	07/25/11 09:00	07/29/11 21:44	7440-36-0	
Arsenic	**10.4**	mg/kg	2.5	100	07/25/11 09:00	07/29/11 21:58	7440-38-2	
Barium	**222**	mg/kg	0.30	20	07/25/11 09:00	07/29/11 21:44	7440-39-3	
Cadmium	**0.19**	mg/kg	0.080	20	07/25/11 09:00	07/29/11 21:44	7440-43-9	
Chromium	**8.2**	mg/kg	2.5	100	07/25/11 09:00	07/29/11 21:58	7440-47-3	
Copper	**22.3**	mg/kg	2.5	100	07/25/11 09:00	07/29/11 21:58	7440-50-8	
Iron	**13300**	mg/kg	50.1	20	07/25/11 09:00	07/29/11 21:44	7439-89-6	
Lead	**23.3**	mg/kg	0.10	20	07/25/11 09:00	07/29/11 21:44	7439-92-1	
Manganese	**239**	mg/kg	2.5	100	07/25/11 09:00	07/29/11 21:58	7439-96-5	
Nickel	**8.9**	mg/kg	2.5	100	07/25/11 09:00	07/29/11 21:58	7440-02-0	
Silver	**<0.50**	mg/kg	0.50	20	07/25/11 09:00	07/29/11 21:44	7440-22-4	
Zinc	**54.0**	mg/kg	25.1	100	07/25/11 09:00	07/29/11 21:58	7440-66-6	
7471 Mercury	Analytical Method: EPA 7471 Preparation Method: EPA 7471							
Mercury	**0.029**	mg/kg	0.025	1	07/22/11 14:31	08/01/11 14:04	7439-97-6	
Dry Weight	Analytical Method: % Moisture							
Percent Moisture	**20.2**	%	0.10	1		07/25/11 00:00		
353.2 Nitrate + Nitrite pres.	Analytical Method: ASA 33-3.2/EPA 353.2							
Available Nitrate	**<5.0**	mg/kg	5.0	1		07/26/11 18:17		
Coarse	Analytical Method: ASTM D421							
Coarse Fragment	**11.7**	% (w/w)	0.10	1		07/26/11 12:15		
Organic Matter MT ASA 29	Analytical Method: ASA 29-3.5.2							
Organic Matter	**<0.10**	% (w/w)	0.10	1		07/21/11 16:50		
ASA 10-3.2 pH	Analytical Method: ASA 10-3.2							
pH, Saturated Paste	**6.8**	Std. Units	0.10	1		07/27/11 17:39		
SM4500P-E, Total Phosphorus	Analytical Method: ASA 24-5.4/SM4500							
Available Phosphorus	**<1.0**	mg/kg	1.0	1		07/25/11 14:49	7723-14-0	
Sobek Acid Base Potential	Analytical Method: Modified Sobek 3.2							
Neutralization Potential	**3.5**	tons/1000	0.50	1		07/29/11 00:00		

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ANALYTICAL RESULTS

Project: Black Pine Mine
Pace Project No.: 10163644

Sample: BP-CMN-SS-12-04 **Lab ID: 10163644008** Collected: 07/14/11 16:20 Received: 07/16/11 11:30 Matrix: Solid

Results reported on a "dry-weight" basis

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
Sobek Extractable Sulfur	Analytical Method: Modified Sobek 3.2							
Sulfur, HCl Extractable	**<0.050**	% (w/w)	0.050	1		07/26/11 15:00		
Sulfur, HNO3 Extractable	**<0.050**	% (w/w)	0.050	1		07/26/11 15:00		
Sulfur, Hot Water Extractable	**<0.050**	% (w/w)	0.050	1		07/26/11 15:00		
Sulfur, Residual	**<0.050**	% (w/w)	0.050	1		07/26/11 15:00		
Total Sulfur	**<0.050**	% (w/w)	0.050	1		07/26/11 15:00		
Sobek Calculations	Analytical Method: Modified Sobek 3.2							
Acid/Base Potential	**3.5**	tons/1000		1		07/26/11 15:00		
Acid Potential	**<4.3**	tons/1000	4.3	1		07/26/11 15:00		
Lime Requirement	**<5.4**	tons/1000	5.4	1		07/26/11 15:00		
SMP Lime Requirement	**0**	tons/1000	0.0	1		07/26/11 15:00		
Sobek SMP Buffer pH	Analytical Method: Modified Sobek 3.2							
SMP Buffer pH	**7.0**	Std. Units	0.10	1		07/26/11 15:00		
ASA10-3.3 Specific Conductance	Analytical Method: ASA 10-3.3							
Sp.Conductance Saturated Paste	**0.91**	mmhos/cm	0.010	1		07/27/11 12:56		

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ANALYTICAL RESULTS

Project: Black Pine Mine
Pace Project No.: 10163644

Sample: BP-CMN-SS-11-00 **Lab ID: 10163644009** Collected: 07/14/11 16:40 Received: 07/16/11 11:30 Matrix: Solid

Results reported on a "dry-weight" basis

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
6020 MET ICPMS	Analytical Method: EPA 6020 Preparation Method: EPA 3050							
Antimony	**16.2**	mg/kg	0.51	20	07/25/11 09:00	07/29/11 22:02	7440-36-0	
Arsenic	**22.5**	mg/kg	0.51	20	07/25/11 09:00	07/29/11 22:02	7440-38-2	
Barium	**130**	mg/kg	0.31	20	07/25/11 09:00	07/29/11 22:02	7440-39-3	
Cadmium	**1.2**	mg/kg	0.082	20	07/25/11 09:00	07/29/11 22:02	7440-43-9	
Chromium	**4.8**	mg/kg	0.51	20	07/25/11 09:00	07/29/11 22:02	7440-47-3	
Copper	**64.2**	mg/kg	0.51	20	07/25/11 09:00	07/29/11 22:02	7440-50-8	
Iron	**8570**	mg/kg	51.5	20	07/25/11 09:00	07/29/11 22:02	7439-89-6	
Lead	**110**	mg/kg	0.10	20	07/25/11 09:00	07/29/11 22:02	7439-92-1	
Manganese	**311**	mg/kg	0.51	20	07/25/11 09:00	07/29/11 22:02	7439-96-5	
Nickel	**5.5**	mg/kg	0.51	20	07/25/11 09:00	07/29/11 22:02	7440-02-0	
Silver	**2.3**	mg/kg	0.51	20	07/25/11 09:00	07/29/11 22:02	7440-22-4	
Zinc	**133**	mg/kg	5.1	20	07/25/11 09:00	07/29/11 22:02	7440-66-6	
7471 Mercury	Analytical Method: EPA 7471 Preparation Method: EPA 7471							
Mercury	**0.070**	mg/kg	0.021	1	07/22/11 14:31	08/01/11 14:07	7439-97-6	
Dry Weight	Analytical Method: % Moisture							
Percent Moisture	**9.2**	%	0.10	1		07/25/11 00:00		
Sobek Acid Base Potential	Analytical Method: Modified Sobek 3.2							
Neutralization Potential	**1.5**	tons/1000	0.50	1		08/01/11 00:00		
Sobek Extractable Sulfur	Analytical Method: Modified Sobek 3.2							
Sulfur, HCl Extractable	**<0.050**	% (w/w)	0.050	1		08/09/11 09:47		
Sulfur, HNO3 Extractable	**<0.050**	% (w/w)	0.050	1		08/09/11 09:47		
Sulfur, Hot Water Extractable	**<0.050**	% (w/w)	0.050	1		08/09/11 09:47		
Sulfur, Residual	**<0.050**	% (w/w)	0.050	1		08/09/11 09:47		
Total Sulfur	**<0.050**	% (w/w)	0.050	1		08/09/11 09:47		
Sobek Calculations	Analytical Method: Modified Sobek 3.2							
Acid/Base Potential	**1.5**	tons/1000		1		08/01/11 00:00		
Acid Potential	**<4.3**	tons/1000	4.3	1		08/01/11 00:00		
Lime Requirement	**<5.4**	tons/1000	5.4	1		08/01/11 00:00		
SMP Lime Requirement	**0**	tons/1000	0.0	1		08/01/11 00:00		
Sobek SMP Buffer pH	Analytical Method: Modified Sobek 3.2							
SMP Buffer pH	**7.2**	Std. Units	0.10	1		07/29/11 13:24		

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ANALYTICAL RESULTS

Project: Black Pine Mine
Pace Project No.: 10163644

Sample: BP-CMN-SS-11-04 **Lab ID: 10163644010** Collected: 07/14/11 16:45 Received: 07/16/11 11:30 Matrix: Solid

Results reported on a "dry-weight" basis

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
6010 MET ICP, MDEQ Potassium	Analytical Method: CLPICPAES Preparation Method: ASA 13-3.5.2.2							
Potassium	**<123**	mg/kg	123	5	08/01/11 17:34	08/01/11 19:25	7440-09-7	
Cation Exchange Capacity	Analytical Method: EPA 9081							
Cation Exchange Capacity	**21.7**	meq/100g	0.99	10	08/03/11 14:00	08/05/11 14:04		
6020 MET ICPMS	Analytical Method: EPA 6020 Preparation Method: EPA 3050							
Antimony	**4.1**	mg/kg	0.49	20	07/25/11 09:00	07/29/11 22:09	7440-36-0	
Arsenic	**29.5**	mg/kg	2.5	100	07/25/11 09:00	07/29/11 22:12	7440-38-2	
Barium	**116**	mg/kg	0.30	20	07/25/11 09:00	07/29/11 22:09	7440-39-3	
Cadmium	**<0.079**	mg/kg	0.079	20	07/25/11 09:00	07/29/11 22:09	7440-43-9	
Chromium	**6.2**	mg/kg	0.49	20	07/25/11 09:00	07/29/11 22:09	7440-47-3	
Copper	**18.4**	mg/kg	2.5	100	07/25/11 09:00	07/29/11 22:12	7440-50-8	
Iron	**27500**	mg/kg	247	100	07/25/11 09:00	07/29/11 22:12	7439-89-6	
Lead	**55.4**	mg/kg	0.099	20	07/25/11 09:00	07/29/11 22:09	7439-92-1	
Manganese	**610**	mg/kg	2.5	100	07/25/11 09:00	07/29/11 22:12	7439-96-5	
Nickel	**7.2**	mg/kg	2.5	100	07/25/11 09:00	07/29/11 22:12	7440-02-0	
Silver	**0.59**	mg/kg	0.49	20	07/25/11 09:00	07/29/11 22:09	7440-22-4	
Zinc	**43.1**	mg/kg	24.7	100	07/25/11 09:00	07/29/11 22:12	7440-66-6	
7471 Mercury	Analytical Method: EPA 7471 Preparation Method: EPA 7471							
Mercury	**0.030**	mg/kg	0.021	1	07/22/11 14:31	08/01/11 14:13	7439-97-6	
Dry Weight	Analytical Method: % Moisture							
Percent Moisture	**9.8**	%	0.10	1		07/25/11 00:00		
353.2 Nitrate + Nitrite pres.	Analytical Method: ASA 33-3.2/EPA 353.2							
Available Nitrate	**<5.0**	mg/kg	5.0	1		07/26/11 18:20		
Coarse	Analytical Method: ASTM D421							
Coarse Fragment	**10.9**	% (w/w)	0.10	1		07/26/11 12:15		
Organic Matter MT ASA 29	Analytical Method: ASA 29-3.5.2							
Organic Matter	**<0.10**	% (w/w)	0.10	1		07/21/11 16:50		
ASA 10-3.2 pH	Analytical Method: ASA 10-3.2							
pH, Saturated Paste	**7.2**	Std. Units	0.10	1		07/27/11 17:41		
SM4500P-E, Total Phosphorus	Analytical Method: ASA 24-5.4/SM4500							
Available Phosphorus	**<1.0**	mg/kg	1.0	1		07/25/11 14:50	7723-14-0	
Sobek Acid Base Potential	Analytical Method: Modified Sobek 3.2							
Neutralization Potential	**3.2**	tons/1000	0.50	1		07/29/11 00:00		

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ANALYTICAL RESULTS

Project: Black Pine Mine
Pace Project No.: 10163644

Sample: BP-CMN-SS-11-04 **Lab ID: 10163644010** Collected: 07/14/11 16:45 Received: 07/16/11 11:30 Matrix: Solid

Results reported on a "dry-weight" basis

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
Sobek Extractable Sulfur	Analytical Method: Modified Sobek 3.2							
Sulfur, HCl Extractable	**<0.050**	% (w/w)	0.050	1		07/26/11 15:00		
Sulfur, HNO3 Extractable	**<0.050**	% (w/w)	0.050	1		07/26/11 15:00		
Sulfur, Hot Water Extractable	**<0.050**	% (w/w)	0.050	1		07/26/11 15:00		
Sulfur, Residual	**<0.050**	% (w/w)	0.050	1		07/26/11 15:00		
Total Sulfur	**<0.050**	% (w/w)	0.050	1		07/26/11 15:00		
Sobek Calculations	Analytical Method: Modified Sobek 3.2							
Acid/Base Potential	**3.2**	tons/1000		1		07/26/11 15:00		
Acid Potential	**<4.3**	tons/1000	4.3	1		07/26/11 15:00		
Lime Requirement	**<5.4**	tons/1000	5.4	1		07/26/11 15:00		
SMP Lime Requirement	**0.3**	tons/1000	0.0	1		07/26/11 15:00		
Sobek SMP Buffer pH	Analytical Method: Modified Sobek 3.2							
SMP Buffer pH	**6.9**	Std. Units	0.10	1		07/26/11 15:00		
ASA10-3.3 Specific Conductance	Analytical Method: ASA 10-3.3							
Sp.Conductance Saturated Paste	**0.37**	mmhos/cm	0.010	1		07/27/11 12:56		

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QUALITY CONTROL DATA

Project: Black Pine Mine
Pace Project No.: 10163644

QC Batch: MPRP/27469 Analysis Method: CLPICPAES
QC Batch Method: ASA 13-3.5.2.2 Analysis Description: CLPICPAES MET
Associated Lab Samples: 10163644006, 10163644008, 10163644010

METHOD BLANK: 1024549 Matrix: Solid
Associated Lab Samples: 10163644006, 10163644008, 10163644010

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Potassium	mg/kg	<124	124	08/01/11 17:43	

LABORATORY CONTROL SAMPLE & LCSD: 1024550 1024551

Parameter	Units	Spike Conc.	LCS Result	LCSD Result	LCS % Rec	LCSD % Rec	% Rec Limits	RPD	Max RPD	Qualifiers
Potassium	mg/kg	156	177	210	114	135	80-120	17	20	

SAMPLE DUPLICATE: 1024552

Parameter	Units	10163634008 Result	Dup Result	RPD	Max RPD	Qualifiers
Potassium	mg/kg	<116	<125		30	

SAMPLE DUPLICATE: 1024553

Parameter	Units	10163644010 Result	Dup Result	RPD	Max RPD	Qualifiers
Potassium	mg/kg	<123	<125		30	

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QUALITY CONTROL DATA

Project: Black Pine Mine
Pace Project No.: 10163644

QC Batch: ICP/14917 Analysis Method: EPA 9081
QC Batch Method: EPA 9081 Analysis Description: Cation Exchange Capacity
Associated Lab Samples: 10163644006, 10163644008, 10163644010

METHOD BLANK: 853094 Matrix: Solid
Associated Lab Samples: 10163644006, 10163644008, 10163644010

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Cation Exchange Capacity	meq/100g	<1.0	1.0	08/05/11 13:25	

LABORATORY CONTROL SAMPLE: 853095

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Cation Exchange Capacity	meq/100g	53.2	53.1	100	62-138	

SAMPLE DUPLICATE: 853096

Parameter	Units	10163645001 Result	Dup Result	RPD	Max RPD	Qualifiers
Cation Exchange Capacity	meq/100g	14.7	14.1	4	47	

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QUALITY CONTROL DATA

Project: Black Pine Mine
Pace Project No.: 10163644

QC Batch: MPRP/27164 Analysis Method: EPA 6020
QC Batch Method: EPA 3050 Analysis Description: 6020 MET
Associated Lab Samples: 10163644001, 10163644002, 10163644003, 10163644004, 10163644005, 10163644006, 10163644007, 10163644008, 10163644009, 10163644010

METHOD BLANK: 1014838 Matrix: Solid
Associated Lab Samples: 10163644001, 10163644002, 10163644003, 10163644004, 10163644005, 10163644006, 10163644007, 10163644008, 10163644009, 10163644010

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Antimony	mg/kg	<0.49	0.49	07/29/11 18:56	
Arsenic	mg/kg	<0.49	0.49	07/29/11 18:56	
Barium	mg/kg	<0.29	0.29	07/29/11 18:56	
Cadmium	mg/kg	<0.078	0.078	07/29/11 18:56	
Chromium	mg/kg	<0.49	0.49	07/29/11 18:56	
Copper	mg/kg	<0.49	0.49	07/29/11 18:56	
Iron	mg/kg	<49.0	49.0	07/29/11 18:56	
Lead	mg/kg	<0.098	0.098	07/29/11 18:56	
Manganese	mg/kg	<0.49	0.49	07/29/11 18:56	
Nickel	mg/kg	<0.49	0.49	07/29/11 18:56	
Silver	mg/kg	<0.49	0.49	07/29/11 18:56	
Zinc	mg/kg	<4.9	4.9	07/29/11 18:56	

LABORATORY CONTROL SAMPLE: 1014839

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Antimony	mg/kg	19.4	21.2	109	75-125	
Arsenic	mg/kg	19.4	21.1	109	75-125	
Barium	mg/kg	19.4	20.1	104	75-125	
Cadmium	mg/kg	19.4	19.8	102	75-125	
Chromium	mg/kg	19.4	20.5	105	75-125	
Copper	mg/kg	19.4	20.6	106	75-125	
Iron	mg/kg	243	258	106	75-125	
Lead	mg/kg	19.4	20.2	104	75-125	
Manganese	mg/kg	19.4	20.1	104	75-125	
Nickel	mg/kg	19.4	21.5	111	75-125	
Silver	mg/kg	19.4	22.0	114	75-125	
Zinc	mg/kg	19.4	20.7	106	75-125	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 1014840 1014841

Parameter	Units	10163643001 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Antimony	mg/kg	529	23.7	19.3	523	420	-26	-566	75-125	22	20	D6,M6
Arsenic	mg/kg	496	23.7	19.3	469	395	-115	-522	75-125	17	20	M6
Barium	mg/kg	289	23.7	19.3	332	266	181	-122	75-125	22	20	D6,M6
Cadmium	mg/kg	7.5	23.7	19.3	31.5	22.4	101	77	75-125	33	20	D6
Chromium	mg/kg	3.7	23.7	19.3	27.8	19.4	101	81	75-125	35	20	D6

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QUALITY CONTROL DATA

Project: Black Pine Mine
Pace Project No.: 10163644

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 1014840 1014841

Parameter	Units	10163643001 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Copper	mg/kg	1110	23.7	19.3	1140	860	146	-1290	75-125	28	20	D6,E, M6
Iron	mg/kg	27600	296	241	25900	21300	-570	-2590	75-125	19	20	M6
Lead	mg/kg	2650	23.7	19.3	2410	2110	-978	-2760	75-125	13	20	E,M6
Manganese	mg/kg	315	23.7	19.3	281	249	-143	-341	75-125	12	20	M6
Nickel	mg/kg	9.3	23.7	19.3	32.8	21.8	99	65	75-125	40	20	D6,M6
Silver	mg/kg	52.5	23.7	19.3	82.1	71.2	125	97	75-125	14	20	
Zinc	mg/kg	250	23.7	19.3	314	224	268	-136	75-125	33	20	D6,M6

MATRIX SPIKE SAMPLE: 1014842

Parameter	Units	10163644001 Result	Spike Conc.	MS Result	MS % Rec	% Rec Limits	Qualifiers
Antimony	mg/kg	15.0	19.3	18.9	20	75-125	M6
Arsenic	mg/kg	8.6	19.3	34.2	133	75-125	M6
Barium	mg/kg	237	19.3	177	-308	75-125	M6
Cadmium	mg/kg	1.4	19.3	19.4	93	75-125	
Chromium	mg/kg	3.3	19.3	21.8	96	75-125	
Copper	mg/kg	139	19.3	128	-56	75-125	M6
Iron	mg/kg	6800	241	12300	2300	75-125	M6
Lead	mg/kg	15.8	19.3	52.5	191	75-125	M6
Manganese	mg/kg	1170	19.3	464	-3680	75-125	M6
Nickel	mg/kg	6.1	19.3	22.8	87	75-125	
Silver	mg/kg	1.0	19.3	20.8	103	75-125	
Zinc	mg/kg	93.2	19.3	132	204	75-125	M6

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QUALITY CONTROL DATA

Project: Black Pine Mine
Pace Project No.: 10163644

QC Batch: MERP/5651 Analysis Method: EPA 7471
QC Batch Method: EPA 7471 Analysis Description: 7471 Mercury
Associated Lab Samples: 10163644001, 10163644002, 10163644003, 10163644004, 10163644005, 10163644006, 10163644007, 10163644008, 10163644009, 10163644010

METHOD BLANK: 1016612 Matrix: Solid
Associated Lab Samples: 10163644001, 10163644002, 10163644003, 10163644004, 10163644005, 10163644006, 10163644007, 10163644008, 10163644009, 10163644010

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Mercury	mg/kg	<0.018	0.018	08/01/11 13:16	

LABORATORY CONTROL SAMPLE: 1016613

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Mercury	mg/kg	.45	0.46	102	80-120	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 1016614 1016615

Parameter	Units	10163643010 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Mercury	mg/kg	4.1	.62	.65	3.8	3.9	-53	-36	80-120	3	20	M6

MATRIX SPIKE SAMPLE: 1016616

Parameter	Units	10163645009 Result	Spike Conc.	MS Result	MS % Rec	% Rec Limits	Qualifiers
Mercury	mg/kg	0.30	.44	0.47	39	80-120	M1

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QUALITY CONTROL DATA

Project: Black Pine Mine
Pace Project No.: 10163644

QC Batch: MPRP/27306 Analysis Method: % Moisture
QC Batch Method: % Moisture Analysis Description: Dry Weight/Percent Moisture
Associated Lab Samples: 10163644001, 10163644002, 10163644003, 10163644004, 10163644005, 10163644006, 10163644007, 10163644008, 10163644009, 10163644010

SAMPLE DUPLICATE: 1019478

Parameter	Units	10163643009 Result	Dup Result	RPD	Max RPD	Qualifiers
Percent Moisture	%	16.2	16.3	1	30	

SAMPLE DUPLICATE: 1019479

Parameter	Units	10163645008 Result	Dup Result	RPD	Max RPD	Qualifiers
Percent Moisture	%	37.2	40.7	9	30	

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QUALITY CONTROL DATA

Project: Black Pine Mine
Pace Project No.: 10163644

QC Batch: MT/6442 Analysis Method: ASA 33-3.2/EPA 353.2
QC Batch Method: ASA 33-3.2/EPA 353.2 Analysis Description: 353.2 Nitrate + Nitrite
Associated Lab Samples: 10163644006, 10163644008, 10163644010

METHOD BLANK: 1016641 Matrix: Solid
Associated Lab Samples: 10163644006, 10163644008, 10163644010

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Available Nitrate	mg/kg	<5.0	5.0	07/26/11 17:37	

LABORATORY CONTROL SAMPLE: 1016642

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Available Nitrate	mg/kg	25	24.0	96	76-124	

SAMPLE DUPLICATE: 1016643

Parameter	Units	10163246004 Result	Dup Result	RPD	Max RPD	Qualifiers
Available Nitrate	mg/kg	<5.0	<5.0		30	

SAMPLE DUPLICATE: 1016644

Parameter	Units	10163644008 Result	Dup Result	RPD	Max RPD	Qualifiers
Available Nitrate	mg/kg	<5.0	<5.0		30	

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QUALITY CONTROL DATA

Project: Black Pine Mine
Pace Project No.: 10163644

QC Batch: MT/6438 Analysis Method: ASA 29-3.5.2
QC Batch Method: ASA 29-3.5.2 Analysis Description: Organic Matter ASA 29
Associated Lab Samples: 10163644006, 10163644008, 10163644010

METHOD BLANK: 1016290 Matrix: Solid
Associated Lab Samples: 10163644006, 10163644008, 10163644010

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Organic Matter	% (w/w)	<0.10	0.10	07/21/11 16:50	

LABORATORY CONTROL SAMPLE: 1016291

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Organic Matter	% (w/w)	3.1	3.3	107	69-131	

SAMPLE DUPLICATE: 1016293

Parameter	Units	10163634008 Result	Dup Result	RPD	Max RPD	Qualifiers
Organic Matter	% (w/w)	0.13	<0.10		30	

SAMPLE DUPLICATE: 1018103

Parameter	Units	10163246002 Result	Dup Result	RPD	Max RPD	Qualifiers
Organic Matter	% (w/w)	3.3	3.2	2	30	

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QUALITY CONTROL DATA

Project: Black Pine Mine
Pace Project No.: 10163644

QC Batch: MT/6426 Analysis Method: ASA 10-3.2
QC Batch Method: ASA 10-3.2 Analysis Description: ASA 10-3.2 pH saturated paste
Associated Lab Samples: 10163644006, 10163644008, 10163644010

SAMPLE DUPLICATE: 1017424

Parameter	Units	10163246004 Result	Dup Result	RPD	Max RPD	Qualifiers
pH, Saturated Paste	Std. Units	7.0	6.9	.7	20	

SAMPLE DUPLICATE: 1017425

Parameter	Units	10163645001 Result	Dup Result	RPD	Max RPD	Qualifiers
pH, Saturated Paste	Std. Units	6.9	6.7	2	20	

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QUALITY CONTROL DATA

Project: Black Pine Mine
Pace Project No.: 10163644

QC Batch: MT/6443 Analysis Method: ASA 24-5.4/SM4500
QC Batch Method: ASA 24-5.4/SM4500 Analysis Description: SM4500P-E, Total Phosphorus
Associated Lab Samples: 10163644006, 10163644008, 10163644010

METHOD BLANK: 1016645 Matrix: Solid
Associated Lab Samples: 10163644006, 10163644008, 10163644010

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Available Phosphorus	mg/kg	<1.0	1.0	07/25/11 14:30	

LABORATORY CONTROL SAMPLE: 1016646

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Available Phosphorus	mg/kg	10	8.0	80	56-144	

SAMPLE DUPLICATE: 1016647

Parameter	Units	10163246004 Result	Dup Result	RPD	Max RPD	Qualifiers
Available Phosphorus	mg/kg	2.8	3.1	9	30	

SAMPLE DUPLICATE: 1016648

Parameter	Units	10163644006 Result	Dup Result	RPD	Max RPD	Qualifiers
Available Phosphorus	mg/kg	1.4	1.4	3	30	

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QUALITY CONTROL DATA

Project: Black Pine Mine
Pace Project No.: 10163644

QC Batch: MT/6480 Analysis Method: Modified Sobek 3.2
QC Batch Method: Modified Sobek 3.2 Analysis Description: Sobek Acid Base Potential
Associated Lab Samples: 10163644006, 10163644008, 10163644010

METHOD BLANK: 1019986 Matrix: Solid
Associated Lab Samples: 10163644006, 10163644008, 10163644010

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Neutralization Potential	tons/1000	<0.5	0.50	07/29/11 00:00	

SAMPLE DUPLICATE: 1019631

Parameter	Units	10163606002 Result	Dup Result	RPD	Max RPD	Qualifiers
Neutralization Potential	tons/1000	1.5	1.7			

SAMPLE DUPLICATE: 1019632

Parameter	Units	10163246007 Result	Dup Result	RPD	Max RPD	Qualifiers
Neutralization Potential	tons/1000	4.0	5.7			

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QUALITY CONTROL DATA

Project: Black Pine Mine
Pace Project No.: 10163644

QC Batch: MT/6497 Analysis Method: Modified Sobek 3.2
QC Batch Method: Modified Sobek 3.2 Analysis Description: Sobek Acid Base Potential
Associated Lab Samples: 10163644001, 10163644003, 10163644005, 10163644007, 10163644009

METHOD BLANK: 1020551 Matrix: Solid
Associated Lab Samples: 10163644001, 10163644003, 10163644005, 10163644007, 10163644009

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Neutralization Potential	tons/1000	<0.5	0.50	08/01/11 00:00	

SAMPLE DUPLICATE: 1020552

Parameter	Units	10163634001 Result	Dup Result	RPD	Max RPD	Qualifiers
Neutralization Potential	tons/1000	0.73	2.2			

SAMPLE DUPLICATE: 1024994

Parameter	Units	10163640008 Result	Dup Result	RPD	Max RPD	Qualifiers
Neutralization Potential	tons/1000	2.4	5.6			

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QUALITY CONTROL DATA

Project: Black Pine Mine
Pace Project No.: 10163644

QC Batch: MT/6452 Analysis Method: Modified Sobek 3.2
QC Batch Method: Modified Sobek 3.2 Analysis Description: Sobek Extractable Sulfur
Associated Lab Samples: 10163644006, 10163644008, 10163644010

METHOD BLANK: 1017262 Matrix: Solid
Associated Lab Samples: 10163644006, 10163644008, 10163644010

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Total Sulfur	% (w/w)	<0.050	0.050	07/29/11 16:11	

SAMPLE DUPLICATE: 1017264

Parameter	Units	10163606002 Result	Dup Result	RPD	Max RPD	Qualifiers
Total Sulfur	% (w/w)	0.228	0.211	8		

SAMPLE DUPLICATE: 1017265

Parameter	Units	10163246007 Result	Dup Result	RPD	Max RPD	Qualifiers
Total Sulfur	% (w/w)	<0.050	<0.050			

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QUALITY CONTROL DATA

Project: Black Pine Mine
Pace Project No.: 10163644

QC Batch: MT/6488 Analysis Method: Modified Sobek 3.2
QC Batch Method: Modified Sobek 3.2 Analysis Description: Sobek Extractable Sulfur
Associated Lab Samples: 10163644001, 10163644003, 10163644005, 10163644007, 10163644009

METHOD BLANK: 1019974 Matrix: Solid
Associated Lab Samples: 10163644001, 10163644003, 10163644005, 10163644007, 10163644009

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Total Sulfur	% (w/w)	<0.050	0.050	08/08/11 14:36	

SAMPLE DUPLICATE: 1019976

Parameter	Units	10163634001 Result	Dup Result	RPD	Max RPD	Qualifiers
Total Sulfur	% (w/w)	<0.050	<0.050			

SAMPLE DUPLICATE: 1019977

Parameter	Units	10163643005 Result	Dup Result	RPD	Max RPD	Qualifiers
Total Sulfur	% (w/w)	0.0605	0.0697	14		

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QUALITY CONTROL DATA

Project: Black Pine Mine
Pace Project No.: 10163644

QC Batch: MT/6481 Analysis Method: Modified Sobek 3.2
QC Batch Method: Modified Sobek 3.2 Analysis Description: Sobek SMP Buffer pH
Associated Lab Samples: 10163644006, 10163644008, 10163644010

LABORATORY CONTROL SAMPLE: 1019634

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
SMP Buffer pH	Std. Units		7.0			

SAMPLE DUPLICATE: 1019635

Parameter	Units	10163606002 Result	Dup Result	RPD	Max RPD	Qualifiers
SMP Buffer pH	Std. Units	6.6	6.6	0	20	

SAMPLE DUPLICATE: 1019636

Parameter	Units	10163246007 Result	Dup Result	RPD	Max RPD	Qualifiers
SMP Buffer pH	Std. Units	6.8	6.8	.7	20	

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QUALITY CONTROL DATA

Project: Black Pine Mine
Pace Project No.: 10163644

QC Batch: MT/6543 Analysis Method: Modified Sobek 3.2
QC Batch Method: Modified Sobek 3.2 Analysis Description: Sobek SMP Buffer pH
Associated Lab Samples: 10163644001, 10163644003, 10163644005, 10163644007, 10163644009

SAMPLE DUPLICATE: 1022818

Parameter	Units	10163634001 Result	Dup Result	RPD	Max RPD	Qualifiers
SMP Buffer pH	Std. Units	7.3	7.2	.3	20	

SAMPLE DUPLICATE: 1026468

Parameter	Units	10163643005 Result	Dup Result	RPD	Max RPD	Qualifiers
SMP Buffer pH	Std. Units	7.1	7.1	.3	20	

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QUALITY CONTROL DATA

Project: Black Pine Mine
Pace Project No.: 10163644

QC Batch: MT/6547 Analysis Method: ASA 10-3.3
QC Batch Method: ASA 10-3.3 Analysis Description: ASA 10-3.3 Specific Conductance
Associated Lab Samples: 10163644008, 10163644010

METHOD BLANK: 1022940 Matrix: Water
Associated Lab Samples: 10163644008, 10163644010

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Sp.Conductance Saturated Paste	mmhos/cm	<0.010	0.010	07/27/11 12:56	

LABORATORY CONTROL SAMPLE: 1022941

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Sp.Conductance Saturated Paste	mmhos/cm	.85	0.80	94	53-147	

SAMPLE DUPLICATE: 1022942

Parameter	Units	10163246004 Result	Dup Result	RPD	Max RPD	Qualifiers
Sp.Conductance Saturated Paste	mmhos/cm	0.091	0.088	3	20	

SAMPLE DUPLICATE: 1022943

Parameter	Units	10163645001 Result	Dup Result	RPD	Max RPD	Qualifiers
Sp.Conductance Saturated Paste	mmhos/cm	0.20	0.14	33	20	D6

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QUALITY CONTROL DATA

Project: Black Pine Mine
Pace Project No.: 10163644

QC Batch: MT/6575
QC Batch Method: ASA 10-3.3
Analysis Method: ASA 10-3.3
Analysis Description: ASA 10-3.3 Specific Conductance
Associated Lab Samples: 10163644006

METHOD BLANK: 1025145
Matrix: Water
Associated Lab Samples: 10163644006

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Sp.Conductance Saturated Paste	mmhos/cm	<0.010	0.010	08/03/11 19:49	

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QUALIFIERS

Project: Black Pine Mine
Pace Project No.: 10163644

DEFINITIONS

DF - Dilution Factor, if reported, represents the factor applied to the reported data due to changes in sample preparation, dilution of the sample aliquot, or moisture content.

ND - Not Detected at or above adjusted reporting limit.

J - Estimated concentration above the adjusted method detection limit and below the adjusted reporting limit.

MDL - Adjusted Method Detection Limit.

S - Surrogate

1,2-Diphenylhydrazine (8270 listed analyte) decomposes to Azobenzene.

Consistent with EPA guidelines, unrounded data are displayed and have been used to calculate % recovery and RPD values.

LCS(D) - Laboratory Control Sample (Duplicate)

MS(D) - Matrix Spike (Duplicate)

DUP - Sample Duplicate

RPD - Relative Percent Difference

NC - Not Calculable.

SG - Silica Gel - Clean-Up

U - Indicates the compound was analyzed for, but not detected.

N-Nitrosodiphenylamine decomposes and cannot be separated from Diphenylamine using Method 8270. The result reported for each analyte is a combined concentration.

LABORATORIES

PASI-K	Pace Analytical Services - Kansas City
PASI-M	Pace Analytical Services - Minneapolis
PASI-MT	Pace Analytical Services - Montana

ANALYTE QUALIFIERS

D6	The relative percent difference (RPD) between the sample and sample duplicate exceeded laboratory control limits.
E	Analyte concentration exceeded the calibration range. The reported result is estimated.
M1	Matrix spike recovery exceeded QC limits. Batch accepted based on laboratory control sample (LCS) recovery.
M6	Matrix spike and Matrix spike duplicate recovery not evaluated against control limits due to sample dilution.

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QUALITY CONTROL DATA CROSS REFERENCE TABLE

Project: Black Pine Mine
Pace Project No.: 10163644

Lab ID	Sample ID	QC Batch Method	QC Batch	Analytical Method	Analytical Batch
10163644006	**BP-CMN-SS-13-04**	ASA 13-3.5.2.2	MPRP/27469	CLPICPAES	ICP/11638
10163644008	**BP-CMN-SS-12-04**	ASA 13-3.5.2.2	MPRP/27469	CLPICPAES	ICP/11638
10163644010	**BP-CMN-SS-11-04**	ASA 13-3.5.2.2	MPRP/27469	CLPICPAES	ICP/11638
10163644006	**BP-CMN-SS-13-04**	EPA 9081	ICP/14917	EPA 9081	ICP/13002
10163644008	**BP-CMN-SS-12-04**	EPA 9081	ICP/14917	EPA 9081	ICP/13002
10163644010	**BP-CMN-SS-11-04**	EPA 9081	ICP/14917	EPA 9081	ICP/13002
10163644001	**BP-CMN-SS-10-00**	EPA 3050	MPRP/27164	EPA 6020	ICPM/11124
10163644002	**BP-CMN-SS-10-04**	EPA 3050	MPRP/27164	EPA 6020	ICPM/11124
10163644003	**BP-CMN-SS-14-00**	EPA 3050	MPRP/27164	EPA 6020	ICPM/11124
10163644004	**BP-CMN-SS-14-04**	EPA 3050	MPRP/27164	EPA 6020	ICPM/11124
10163644005	**BP-CMN-SS-13-00**	EPA 3050	MPRP/27164	EPA 6020	ICPM/11124
10163644006	**BP-CMN-SS-13-04**	EPA 3050	MPRP/27164	EPA 6020	ICPM/11124
10163644007	**BP-CMN-SS-12-00**	EPA 3050	MPRP/27164	EPA 6020	ICPM/11124
10163644008	**BP-CMN-SS-12-04**	EPA 3050	MPRP/27164	EPA 6020	ICPM/11124
10163644009	**BP-CMN-SS-11-00**	EPA 3050	MPRP/27164	EPA 6020	ICPM/11124
10163644010	**BP-CMN-SS-11-04**	EPA 3050	MPRP/27164	EPA 6020	ICPM/11124
10163644001	**BP-CMN-SS-10-00**	EPA 7471	MERP/5651	EPA 7471	MERC/6471
10163644002	**BP-CMN-SS-10-04**	EPA 7471	MERP/5651	EPA 7471	MERC/6471
10163644003	**BP-CMN-SS-14-00**	EPA 7471	MERP/5651	EPA 7471	MERC/6471
10163644004	**BP-CMN-SS-14-04**	EPA 7471	MERP/5651	EPA 7471	MERC/6471
10163644005	**BP-CMN-SS-13-00**	EPA 7471	MERP/5651	EPA 7471	MERC/6471
10163644006	**BP-CMN-SS-13-04**	EPA 7471	MERP/5651	EPA 7471	MERC/6471
10163644007	**BP-CMN-SS-12-00**	EPA 7471	MERP/5651	EPA 7471	MERC/6471
10163644008	**BP-CMN-SS-12-04**	EPA 7471	MERP/5651	EPA 7471	MERC/6471
10163644009	**BP-CMN-SS-11-00**	EPA 7471	MERP/5651	EPA 7471	MERC/6471
10163644010	**BP-CMN-SS-11-04**	EPA 7471	MERP/5651	EPA 7471	MERC/6471
10163644001	**BP-CMN-SS-10-00**	% Moisture	MPRP/27306		
10163644002	**BP-CMN-SS-10-04**	% Moisture	MPRP/27306		
10163644003	**BP-CMN-SS-14-00**	% Moisture	MPRP/27306		
10163644004	**BP-CMN-SS-14-04**	% Moisture	MPRP/27306		
10163644005	**BP-CMN-SS-13-00**	% Moisture	MPRP/27306		
10163644006	**BP-CMN-SS-13-04**	% Moisture	MPRP/27306		
10163644007	**BP-CMN-SS-12-00**	% Moisture	MPRP/27306		
10163644008	**BP-CMN-SS-12-04**	% Moisture	MPRP/27306		
10163644009	**BP-CMN-SS-11-00**	% Moisture	MPRP/27306		
10163644010	**BP-CMN-SS-11-04**	% Moisture	MPRP/27306		
10163644006	**BP-CMN-SS-13-04**	ASA 33-3.2/EPA 353.2	MT/6442		
10163644008	**BP-CMN-SS-12-04**	ASA 33-3.2/EPA 353.2	MT/6442		
10163644010	**BP-CMN-SS-11-04**	ASA 33-3.2/EPA 353.2	MT/6442		
10163644006	**BP-CMN-SS-13-04**	ASTM D421	MT/6412		
10163644008	**BP-CMN-SS-12-04**	ASTM D421	MT/6412		
10163644010	**BP-CMN-SS-11-04**	ASTM D421	MT/6412		
10163644006	**BP-CMN-SS-13-04**	ASA 29-3.5.2	MT/6438		
10163644008	**BP-CMN-SS-12-04**	ASA 29-3.5.2	MT/6438		
10163644010	**BP-CMN-SS-11-04**	ASA 29-3.5.2	MT/6438		

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QUALITY CONTROL DATA CROSS REFERENCE TABLE

Project: Black Pine Mine
Pace Project No.: 10163644

Lab ID	Sample ID	QC Batch Method	QC Batch	Analytical Method	Analytical Batch
10163644006	**BP-CMN-SS-13-04**	ASA 10-3.2	MT/6426		
10163644008	**BP-CMN-SS-12-04**	ASA 10-3.2	MT/6426		
10163644010	**BP-CMN-SS-11-04**	ASA 10-3.2	MT/6426		
10163644006	**BP-CMN-SS-13-04**	ASA 24-5.4/SM4500	MT/6443		
10163644008	**BP-CMN-SS-12-04**	ASA 24-5.4/SM4500	MT/6443		
10163644010	**BP-CMN-SS-11-04**	ASA 24-5.4/SM4500	MT/6443		
10163644001	**BP-CMN-SS-10-00**	Modified Sobek 3.2	MT/6497		
10163644003	**BP-CMN-SS-14-00**	Modified Sobek 3.2	MT/6497		
10163644005	**BP-CMN-SS-13-00**	Modified Sobek 3.2	MT/6497		
10163644006	**BP-CMN-SS-13-04**	Modified Sobek 3.2	MT/6480		
10163644007	**BP-CMN-SS-12-00**	Modified Sobek 3.2	MT/6497		
10163644008	**BP-CMN-SS-12-04**	Modified Sobek 3.2	MT/6480		
10163644009	**BP-CMN-SS-11-00**	Modified Sobek 3.2	MT/6497		
10163644010	**BP-CMN-SS-11-04**	Modified Sobek 3.2	MT/6480		
10163644001	**BP-CMN-SS-10-00**	Modified Sobek 3.2	MT/6488		
10163644003	**BP-CMN-SS-14-00**	Modified Sobek 3.2	MT/6488		
10163644005	**BP-CMN-SS-13-00**	Modified Sobek 3.2	MT/6488		
10163644006	**BP-CMN-SS-13-04**	Modified Sobek 3.2	MT/6452		
10163644007	**BP-CMN-SS-12-00**	Modified Sobek 3.2	MT/6488		
10163644008	**BP-CMN-SS-12-04**	Modified Sobek 3.2	MT/6452		
10163644009	**BP-CMN-SS-11-00**	Modified Sobek 3.2	MT/6488		
10163644010	**BP-CMN-SS-11-04**	Modified Sobek 3.2	MT/6452		
10163644001	**BP-CMN-SS-10-00**	Modified Sobek 3.2	MT/6501		
10163644003	**BP-CMN-SS-14-00**	Modified Sobek 3.2	MT/6501		
10163644005	**BP-CMN-SS-13-00**	Modified Sobek 3.2	MT/6501		
10163644006	**BP-CMN-SS-13-04**	Modified Sobek 3.2	MT/6499		
10163644007	**BP-CMN-SS-12-00**	Modified Sobek 3.2	MT/6501		
10163644008	**BP-CMN-SS-12-04**	Modified Sobek 3.2	MT/6499		
10163644009	**BP-CMN-SS-11-00**	Modified Sobek 3.2	MT/6501		
10163644010	**BP-CMN-SS-11-04**	Modified Sobek 3.2	MT/6499		
10163644001	**BP-CMN-SS-10-00**	Modified Sobek 3.2	MT/6543		
10163644003	**BP-CMN-SS-14-00**	Modified Sobek 3.2	MT/6543		
10163644005	**BP-CMN-SS-13-00**	Modified Sobek 3.2	MT/6543		
10163644006	**BP-CMN-SS-13-04**	Modified Sobek 3.2	MT/6481		
10163644007	**BP-CMN-SS-12-00**	Modified Sobek 3.2	MT/6543		
10163644008	**BP-CMN-SS-12-04**	Modified Sobek 3.2	MT/6481		
10163644009	**BP-CMN-SS-11-00**	Modified Sobek 3.2	MT/6543		

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QUALITY CONTROL DATA CROSS REFERENCE TABLE

Project: Black Pine Mine
Pace Project No.: 10163644

Lab ID	Sample ID	QC Batch Method	QC Batch	Analytical Method	Analytical Batch
10163644010	**BP-CMN-SS-11-04**	Modified Sobek 3.2	MT/6481		
10163644006	**BP-CMN-SS-13-04**	ASA 10-3.3	MT/6575		
10163644008	**BP-CMN-SS-12-04**	ASA 10-3.3	MT/6547		
10163644010	**BP-CMN-SS-11-04**	ASA 10-3.3	MT/6547		

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CHAIN-OF-CUSTODY / Analytical Request Document

The Chain-of-Custody is a LEGAL DOCUMENT. All relevant fields must be completed accurately.

Page: 1 of 1

1429910

Section A Required Client Information:	Section B Required Project Information:	Section C Invoice Information:
Company: HERRERA	Report To: KEVIN HUCK	Attention:
Address:	Copy To:	Company Name:
		Address:
Email To:	Purchase Order No.:	Pace Quote Reference:
Phone: Fax:	Project Name:	Pace Project Manager:
Requested Due Date/TAT:	Project Number:	Pace Profile #:

REGULATORY AGENCY

☐ NPDES ☐ GROUND WATER ☐ DRINKING WATER

☐ UST ☐ RCRA ☐ OTHER _____

Site Location STATE: _____

Requested Analysis Filtered (Y/N)

Section D Required Client Information

Matrix Codes (MATRIX / CODE)

Drinking Water	DW
Water	WT
Waste Water	WW
Product	P
Soil/Solid	SL
Oil	OL
Wipe	WP
Air	AR
Tissue	TS
Other	OT

SAMPLE ID
(A-Z, 0-9 / ,-)
Sample IDs MUST BE UNIQUE

ITEM #	SAMPLE ID	MATRIX CODE (see valid codes to left)	SAMPLE TYPE (G=GRAB C=COMP)	COLLECTED: COMPOSITE START DATE	COMPOSITE START TIME	COMPOSITE END/GRAB DATE	COMPOSITE END/GRAB TIME	SAMPLE TEMP AT COLLECTION	# OF CONTAINERS	Preservatives: Unpreserved	H_2SO_4	HNO_3	HCl	NaOH	$Na_2S_2O_3$	Methanol	Other	Analysis Test Y/N	Tom Reed METALS	ABA	AGRICULTURE	Residual Chlorine (Y/N)	Pace Project No./ Lab I.D.
1	BP-CMN-55-10-00	SL				7/14/11	1455		2	X									X	X			10163644 001
2	BP-CMN-55-10-04	SL				7/14/11	1500		1	X									X				002
3	BP-CMN-55-14-00	SL				7/14/11	1515		2	X									X	X			003
4	BP-CMN-55-14-04	SL				7/14/11	1520		1	X									X				004
5	BP-CMN-55-13-00	SL				7/14/11	1550		2	X									X	X			005
6	BP-CMN-55-13-04	SL				7/14/11	1555		2	X									X		X		006
7	BP-CMN-55-12-00	SL				7/14/11	1615		2	X									X	X			007
8	BP-CMN-55-12-04	SL				7/14/11	1620		2	X									X		X		008
9	BP-CMN-55-11-00	SL				7/14/11	1640		2	X									X	X			009
10	BP-CMN-55-11-04	SL				7/14/11	1645		2	X									X		X		010
11																							
12																							

ADDITIONAL COMMENTS	RELINQUISHED BY / AFFILIATION	DATE	TIME	ACCEPTED BY / AFFILIATION	DATE	TIME	SAMPLE CONDITIONS: Temp in °C	Received on Ice (Y/N)	Custody Sealed Cooler (Y/N)	Samples Intact (Y/N)
	FedEx Rvpickup (E)	7/16/11	1131	[signature] Pace	7/16/11	1130	3°	Y	Y	Y

ORIGINAL

SAMPLER NAME AND SIGNATURE

PRINT Name of SAMPLER: ALEX SVENDSEN

SIGNATURE of SAMPLER: [signature] DATE Signed (MM/DD/YY): 7/15/11

*Important Note: By signing this form you are accepting Pace's NET 30 day payment terms and agreeing to late charges of 1.5% per month for any invoices not paid within 30 days.

F-ALL-Q-020rev.07, 15-May-2007

Sample Condition Upon Receipt

Pace Analytical

Client Name: MDEQ - BLACK PINE Project # 10163644

Courier: [X] Fed Ex [ ] UPS [ ] USPS [ ] Client [ ] Commercial [ ] Pace Other _____

Tracking #: 876249308789

Custody Seal on Cooler/Box Present: [X] yes [ ] no Seals intact: [X] yes [ ] no

Packing Material: [ ] Bubble Wrap [X] Bubble Bags [ ] None [ ] Other _____ Temp Blank: Yes [X] No [ ]

Thermometer Used 383045 or 135 Type of Ice: (Wet) Blue None [X] Samples on ice, cooling process has begun

Cooler Temperature 3.0° Biological Tissue is Frozen: Yes No

Temp should be above freezing to 6°C

Comments:

Date and Initials of person examining contents: NCT 7/17/11

Chain of Custody Present:	[X] Yes [ ] No [ ] N/A	1.
Chain of Custody Filled Out:	[X] Yes [ ] No [ ] N/A	2.
Chain of Custody Relinquished:	[X] Yes [ ] No [ ] N/A	3.
Sampler Name & Signature on COC:	[X] Yes [ ] No [ ] N/A	4.
Samples Arrived within Hold Time:	[X] Yes [ ] No [ ] N/A	5.
Short Hold Time Analysis (<72hr):	[ ] Yes [X] No [ ] N/A	6.
Rush Turn Around Time Requested:	[ ] Yes [X] No [ ] N/A	7.
Sufficient Volume:	[X] Yes [ ] No [ ] N/A	8.
Correct Containers Used:	[X] Yes [ ] No [ ] N/A	9.
-Pace Containers Used:	[X] Yes [ ] No [ ] N/A	
Containers Intact:	[X] Yes [ ] No [ ] N/A	10.
Filtered volume received for Dissolved tests	[ ] Yes [ ] No [X] N/A	11.
Sample Labels match COC:	[X] Yes [ ] No [ ] N/A	12.
-Includes date/time/ID/Analysis Matrix: SOIL		
All containers needing acid/base preservation have been checked. Noncompliance are noted in 13.	[ ] Yes [ ] No [X] N/A	13. [ ] HNO3 [ ] H2SO4 [ ] NaOH [ ] HCl Samp #
All containers needing preservation are found to be in compliance with EPA recommendation.	[ ] Yes [ ] No [X] N/A	
Exceptions: VOA,Coliform, TOC, Oil and Grease, WI-DRO (water)	[ ] Yes [X] No	Initial when completed / Lot # of added preservative
Samples checked for dechlorination:	[ ] Yes [ ] No [X] N/A	14.
Headspace in VOA Vials (>6mm):	[ ] Yes [ ] No [X] N/A	15.
Trip Blank Present:	[ ] Yes [ ] No [X] N/A	16.
Trip Blank Custody Seals Present	[ ] Yes [ ] No [X] N/A	
Pace Trip Blank Lot # (if purchased):		

Client Notification/ Resolution: Field Data Required? Y / N

Person Contacted: _____ Date/Time: _____

Comments/ Resolution: _____

Project Manager Review: [signature] **Date:** 7/18/11

Note: Whenever there is a discrepancy affecting North Carolina compliance samples, a copy of this form will be sent to the North Carolina DEHNR Certification Office (i.e out of hold, incorrect preservative, out of temp, incorrect containers)

Pace Analytical Services, Inc.
602 S 25th Street
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(406)254-7226

August 12, 2011

Kevin Houck
Herrera Environmental Consultants
101 East Broadway, Suite 610
Missoula, MT 59802

RE: Project: Black Pine Mine
Pace Project No.: 10163645

Dear Kevin Houck:
Enclosed are the analytical results for sample(s) received by the laboratory on July 16, 2011. The results relate only to the samples included in this report.

If you have any questions concerning this report, please feel free to contact me.

Sincerely,

Sally Heinje

sally.heinje@pacelabs.com
Project Manager

Enclosures

cc: Devin Clary, Montana Dept. of Environmental Quality
Mark Donner, Trihydro

REPORT OF LABORATORY ANALYSIS

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CERTIFICATIONS

Project: Black Pine Mine
Pace Project No.: 10163645

Minnesota Certification IDs

1700 Elm Street SE Suite 200, Minneapolis, MN 55414
A2LA Certification #: 2926.01
Alaska Certification #: UST-078
Alaska Certification #MN00064
Arizona Certification #: AZ-0014
Arkansas Certification #: 88-0680
California Certification #: 01155CA
EPA Region 8 Certification #: Pace
Florida/NELAP Certification #: E87605
Georgia Certification #: 959
Idaho Certification #: MN00064
Illinois Certification #: 200011
Iowa Certification #: 368
Kansas Certification #: E-10167
Louisiana Certification #: 03086
Louisiana Certification #: LA080009
Maine Certification #: 2007029
Maryland Certification #: 322
Michigan DEQ Certification #: 9909
Minnesota Certification #: 027-053-137
Mississippi Certification #: Pace
Montana Certification #: MT CERT0092
Nevada Certification #: MN_00064
Nebraska Certification #: Pace
New Jersey Certification #: MN-002
New Mexico Certification #: Pace
New York Certification #: 11647
North Carolina Certification #: 530
North Dakota Certification #: R-036
North Dakota Certification #: R-036A
Ohio VAP Certification #: CL101
Oklahoma Certification #: D9921
Oklahoma Certification #: 9507
Oregon Certification #: MN200001
Pennsylvania Certification #: 68-00563
Puerto Rico Certification
Tennessee Certification #: 02818
Texas Certification #: T104704192
Washington Certification #: C754
Wisconsin Certification #: 999407970

Montana Certification IDs

602 South 25th Street, Billings, MT 59101
EPA Region 8 Certification #: 8TMS-Q
Idaho Certification #: MT00012
Montana Certification #: MT CERT0040
NVLAP Certification #: 101292-0
Minnesota Dept of Health Certification #: 030-999-442

Kansas Certification IDs

9608 Loiret Boulevard, Lenexa, KS 66219
A2LA Certification #: 2456.01
Arkansas Certification #: 05-008-0
Illinois Certification #: 001191
Iowa Certification #: 118
Kansas/NELAP Certification #: E-10116
Louisiana Certification #: 03055
Nevada Certification #: KS000212008A
Oklahoma Certification #: 9205/9935
Texas Certification #: T104704407-08-TX
Utah Certification #: 9135995665

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SAMPLE SUMMARY

Project: Black Pine Mine
Pace Project No.: 10163645

Lab ID	Sample ID	Matrix	Date Collected	Date Received
10163645001	**BP-CML-TS-11-01**	Solid	07/15/11 07:35	07/16/11 11:30
10163645002	**BP-CML-TS-11-08**	Solid	07/15/11 07:40	07/16/11 11:30
10163645003	**BP-CML-TS-10-00**	Solid	07/15/11 08:50	07/16/11 11:30
10163645004	**BP-CML-TS-10-02**	Solid	07/15/11 08:52	07/16/11 11:30
10163645005	**BP-CML-SS-10-06**	Solid	07/15/11 08:54	07/16/11 11:30
10163645006	**BP-CML-TS-01-00**	Solid	07/15/11 09:40	07/16/11 11:30
10163645007	**BP-CML-TS-01-02**	Solid	07/15/11 09:42	07/16/11 11:30
10163645008	**BP-CML-SS-01-06**	Solid	07/15/11 09:45	07/16/11 11:30
10163645009	**BP-CML-TS-02-00**	Solid	07/15/11 10:10	07/16/11 11:30
10163645010	**BP-CML-TS-02-02**	Solid	07/15/11 10:15	07/16/11 11:30
10163645011	**BP-CML-SS-02-06**	Solid	07/15/11 10:17	07/16/11 11:30
10163645012	**BP-CML-TS-03-00**	Solid	07/15/11 10:40	07/16/11 11:30
10163645013	**BP-CML-TS-03-02**	Solid	07/15/11 10:43	07/16/11 11:30
10163645014	**BP-CML-SS-03-06**	Solid	07/15/11 10:45	07/16/11 11:30

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SAMPLE ANALYTE COUNT

Project: Black Pine Mine
Pace Project No.: 10163645

Lab ID	Sample ID	Method	Analysts	Analytes Reported	Laboratory
10163645001	**BP-CML-TS-11-01**	CLPICPAES	IP	1	PASI-M
		EPA 9081	SMW	1	PASI-K
		EPA 6020	TL1	12	PASI-M
		EPA 7471	TEM	1	PASI-M
		% Moisture	JDL	1	PASI-M
		ASA 33-3.2/EPA 353.2	CAC	1	PASI-MT
		ASTM D421	CAC	1	PASI-MT
		ASA 29-3.5.2	CAC	1	PASI-MT
		ASA 10-3.2	CAC	1	PASI-MT
		ASA 24-5.4/SM4500	SA1	1	PASI-MT
		Modified Sobek 3.2	JH1	1	PASI-MT
		Modified Sobek 3.2	JH1	5	PASI-MT
		Modified Sobek 3.2	JH1	4	PASI-MT
		Modified Sobek 3.2	JH1	1	PASI-MT
		ASA 10-3.3	SR1	1	PASI-MT
10163645002	**BP-CML-TS-11-08**	CLPICPAES	IP	1	PASI-M
		EPA 9081	SMW	1	PASI-K
		EPA 6020	TL1	12	PASI-M
		EPA 7471	TEM	1	PASI-M
		% Moisture	JDL	1	PASI-M
		ASA 33-3.2/EPA 353.2	CAC	1	PASI-MT
		ASTM D421	CAC	1	PASI-MT
		ASA 29-3.5.2	CAC	1	PASI-MT
		ASA 10-3.2	CAC	1	PASI-MT
		ASA 24-5.4/SM4500	SA1	1	PASI-MT
		Modified Sobek 3.2	JH1	1	PASI-MT
		Modified Sobek 3.2	JH1	5	PASI-MT
		Modified Sobek 3.2	JH1	4	PASI-MT
		Modified Sobek 3.2	JH1	1	PASI-MT
		ASA 10-3.3	SR1	1	PASI-MT
10163645003	**BP-CML-TS-10-00**	EPA 6020	TL1	12	PASI-M
		EPA 7471	TEM	1	PASI-M
		% Moisture	JDL	1	PASI-M
		Modified Sobek 3.2	JH1	1	PASI-MT
		Modified Sobek 3.2	JH1	5	PASI-MT
		Modified Sobek 3.2	JH1	4	PASI-MT
		Modified Sobek 3.2	JH1	1	PASI-MT

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SAMPLE ANALYTE COUNT

Project: Black Pine Mine
Pace Project No.: 10163645

Lab ID	Sample ID	Method	Analysts	Analytes Reported	Laboratory
10163645004	**BP-CML-TS-10-02**	EPA 6020	TL1	12	PASI-M
		EPA 7471	TEM	1	PASI-M
		% Moisture	JDL	1	PASI-M
10163645005	**BP-CML-SS-10-06**	EPA 6020	TL1	12	PASI-M
		EPA 7471	TEM	1	PASI-M
		% Moisture	JDL	1	PASI-M
10163645006	**BP-CML-TS-01-00**	EPA 6020	TL1	12	PASI-M
		EPA 7471	TEM	1	PASI-M
		% Moisture	JDL	1	PASI-M
10163645007	**BP-CML-TS-01-02**	EPA 6020	TL1	12	PASI-M
		EPA 7471	TEM	1	PASI-M
		% Moisture	JDL	1	PASI-M
		Modified Sobek 3.2	JH1	1	PASI-MT
		Modified Sobek 3.2	JH1	5	PASI-MT
		Modified Sobek 3.2	JH1	4	PASI-MT
		Modified Sobek 3.2	JH1	1	PASI-MT
10163645008	**BP-CML-SS-01-06**	EPA 6020	TL1	12	PASI-M
		EPA 7471	TEM	1	PASI-M
		% Moisture	JDL	1	PASI-M
10163645009	**BP-CML-TS-02-00**	EPA 6020	TL1	12	PASI-M
		EPA 7471	TEM	1	PASI-M
		% Moisture	JDL	1	PASI-M
10163645010	**BP-CML-TS-02-02**	EPA 6020	TL1	12	PASI-M
		EPA 7471	TEM	1	PASI-M
		% Moisture	JDL	1	PASI-M
		Modified Sobek 3.2	JH1	1	PASI-MT
		Modified Sobek 3.2	JH1	5	PASI-MT
		Modified Sobek 3.2	JH1	4	PASI-MT
		Modified Sobek 3.2	JH1	1	PASI-MT
10163645011	**BP-CML-SS-02-06**	EPA 6020	TL1	12	PASI-M
		EPA 7471	TEM	1	PASI-M
		% Moisture	JDL	1	PASI-M
10163645012	**BP-CML-TS-03-00**	EPA 6020	TL1	12	PASI-M
		EPA 7471	TEM	1	PASI-M
		% Moisture	JDL	1	PASI-M
10163645013	**BP-CML-TS-03-02**	EPA 6020	TL1	12	PASI-M
		EPA 7471	TEM	1	PASI-M

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SAMPLE ANALYTE COUNT

Project: Black Pine Mine
Pace Project No.: 10163645

Lab ID	Sample ID	Method	Analysts	Analytes Reported	Laboratory
		% Moisture	JDL	1	PASI-M
		Modified Sobek 3.2	JH1	1	PASI-MT
		Modified Sobek 3.2	JH1	5	PASI-MT
		Modified Sobek 3.2	JH1	4	PASI-MT
		Modified Sobek 3.2	JH1	1	PASI-MT
10163645014	**BP-CML-SS-03-06**	EPA 6020	TL1	12	PASI-M
		EPA 7471	TEM	1	PASI-M
		% Moisture	JDL	1	PASI-M

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PROJECT NARRATIVE

Project: Black Pine Mine
Pace Project No.: 10163645

Method: **CLPICPAES**
Description: 6010 MET ICP, MDEQ Potassium
Client: Montana Dept. of Environmental Quality
Date: August 12, 2011

General Information:
2 samples were analyzed for CLPICPAES. All samples were received in acceptable condition with any exceptions noted below.

Hold Time:
The samples were analyzed within the method required hold times with any exceptions noted below.

Sample Preparation:
The samples were prepared in accordance with ASA 13-3.5.2.2 with any exceptions noted below.

Initial Calibrations (including MS Tune as applicable):
All criteria were within method requirements with any exceptions noted below.

Continuing Calibration:
All criteria were within method requirements with any exceptions noted below.

Method Blank:
All analytes were below the report limit in the method blank with any exceptions noted below.

Laboratory Control Spike:
All laboratory control spike compounds were within QC limits with any exceptions noted below.

Matrix Spikes:
All percent recoveries and relative percent differences (RPDs) were within acceptance criteria with any exceptions noted below.

Duplicate Sample:
All duplicate sample results were within method acceptance criteria with any exceptions noted below.

Additional Comments:

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PROJECT NARRATIVE

Project: Black Pine Mine
Pace Project No.: 10163645

Method: **EPA 9081**
Description: Cation Exchange Capacity
Client: Montana Dept. of Environmental Quality
Date: August 12, 2011

General Information:
2 samples were analyzed for EPA 9081. All samples were received in acceptable condition with any exceptions noted below.

Hold Time:
The samples were analyzed within the method required hold times with any exceptions noted below.

Initial Calibrations (including MS Tune as applicable):
All criteria were within method requirements with any exceptions noted below.

Continuing Calibration:
All criteria were within method requirements with any exceptions noted below.

Method Blank:
All analytes were below the report limit in the method blank with any exceptions noted below.

Laboratory Control Spike:
All laboratory control spike compounds were within QC limits with any exceptions noted below.

Matrix Spikes:
All percent recoveries and relative percent differences (RPDs) were within acceptance criteria with any exceptions noted below.

Duplicate Sample:
All duplicate sample results were within method acceptance criteria with any exceptions noted below.

Additional Comments:

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PROJECT NARRATIVE

Project: Black Pine Mine
Pace Project No.: 10163645

Method: **EPA 6020**
Description: 6020 MET ICPMS
Client: Montana Dept. of Environmental Quality
Date: August 12, 2011

General Information:
14 samples were analyzed for EPA 6020. All samples were received in acceptable condition with any exceptions noted below.

Hold Time:
The samples were analyzed within the method required hold times with any exceptions noted below.

Sample Preparation:
The samples were prepared in accordance with EPA 3050 with any exceptions noted below.

Initial Calibrations (including MS Tune as applicable):
All criteria were within method requirements with any exceptions noted below.

Continuing Calibration:
All criteria were within method requirements with any exceptions noted below.

Internal Standards:
All internal standards were within QC limits with any exceptions noted below.

Method Blank:
All analytes were below the report limit in the method blank with any exceptions noted below.

Laboratory Control Spike:
All laboratory control spike compounds were within QC limits with any exceptions noted below.

Matrix Spikes:
All percent recoveries and relative percent differences (RPDs) were within acceptance criteria with any exceptions noted below.

QC Batch: MPRP/27165

A matrix spike and matrix spike duplicate (MS/MSD) were performed on the following sample(s): 10163645001,10163645011

M6: Matrix spike and Matrix spike duplicate recovery not evaluated against control limits due to sample dilution.

- MS (Lab ID: 1014845)
  - Barium
  - Iron
  - Manganese
- MS (Lab ID: 1014847)
  - Antimony
  - Barium
  - Chromium
  - Copper
  - Iron
  - Lead
  - Manganese
  - Zinc
- MSD (Lab ID: 1014846)

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PROJECT NARRATIVE

Project: Black Pine Mine
Pace Project No.: 10163645

Method: **EPA 6020**
Description: 6020 MET ICPMS
Client: Montana Dept. of Environmental Quality
Date: August 12, 2011

QC Batch: MPRP/27165

A matrix spike and matrix spike duplicate (MS/MSD) were performed on the following sample(s): 10163645001,10163645011

M6: Matrix spike and Matrix spike duplicate recovery not evaluated against control limits due to sample dilution.

- Antimony
- Barium
- Iron
- Manganese

Duplicate Sample:
All duplicate sample results were within method acceptance criteria with any exceptions noted below.

Additional Comments:

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PROJECT NARRATIVE

Project: Black Pine Mine
Pace Project No.: 10163645

Method: **EPA 7471**
Description: 7471 Mercury
Client: Montana Dept. of Environmental Quality
Date: August 12, 2011

General Information:
14 samples were analyzed for EPA 7471. All samples were received in acceptable condition with any exceptions noted below.

Hold Time:
The samples were analyzed within the method required hold times with any exceptions noted below.

Sample Preparation:
The samples were prepared in accordance with EPA 7471 with any exceptions noted below.

Initial Calibrations (including MS Tune as applicable):
All criteria were within method requirements with any exceptions noted below.

Continuing Calibration:
All criteria were within method requirements with any exceptions noted below.

Method Blank:
All analytes were below the report limit in the method blank with any exceptions noted below.

Laboratory Control Spike:
All laboratory control spike compounds were within QC limits with any exceptions noted below.

Matrix Spikes:
All percent recoveries and relative percent differences (RPDs) were within acceptance criteria with any exceptions noted below.

QC Batch: MERP/5651

A matrix spike and matrix spike duplicate (MS/MSD) were performed on the following sample(s): 10163643010,10163645009

M1: Matrix spike recovery exceeded QC limits. Batch accepted based on laboratory control sample (LCS) recovery.

- MS (Lab ID: 1016616)
  - Mercury

M6: Matrix spike and Matrix spike duplicate recovery not evaluated against control limits due to sample dilution.

- MS (Lab ID: 1016614)
  - Mercury
- MSD (Lab ID: 1016615)
  - Mercury

Duplicate Sample:
All duplicate sample results were within method acceptance criteria with any exceptions noted below.

Additional Comments:

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PROJECT NARRATIVE

Project: Black Pine Mine
Pace Project No.: 10163645

Method: **ASA 33-3.2/EPA 353.2**
Description: 353.2 Nitrate + Nitrite pres.
Client: Montana Dept. of Environmental Quality
Date: August 12, 2011

General Information:
2 samples were analyzed for ASA 33-3.2/EPA 353.2. All samples were received in acceptable condition with any exceptions noted below.

Hold Time:
The samples were analyzed within the method required hold times with any exceptions noted below.

Initial Calibrations (including MS Tune as applicable):
All criteria were within method requirements with any exceptions noted below.

Continuing Calibration:
All criteria were within method requirements with any exceptions noted below.

Internal Standards:
All internal standards were within QC limits with any exceptions noted below.

Surrogates:
All surrogates were within QC limits with any exceptions noted below.

Method Blank:
All analytes were below the report limit in the method blank with any exceptions noted below.

Laboratory Control Spike:
All laboratory control spike compounds were within QC limits with any exceptions noted below.

Matrix Spikes:
All percent recoveries and relative percent differences (RPDs) were within acceptance criteria with any exceptions noted below.

Duplicate Sample:
All duplicate sample results were within method acceptance criteria with any exceptions noted below.

Additional Comments:

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PROJECT NARRATIVE

Project: Black Pine Mine
Pace Project No.: 10163645

Method: **ASTM D421**
Description: Coarse
Client: Montana Dept. of Environmental Quality
Date: August 12, 2011

General Information:
2 samples were analyzed for ASTM D421. All samples were received in acceptable condition with any exceptions noted below.

Hold Time:
The samples were analyzed within the method required hold times with any exceptions noted below.

Initial Calibrations (including MS Tune as applicable):
All criteria were within method requirements with any exceptions noted below.

Continuing Calibration:
All criteria were within method requirements with any exceptions noted below.

Internal Standards:
All internal standards were within QC limits with any exceptions noted below.

Surrogates:
All surrogates were within QC limits with any exceptions noted below.

Method Blank:
All analytes were below the report limit in the method blank with any exceptions noted below.

Laboratory Control Spike:
All laboratory control spike compounds were within QC limits with any exceptions noted below.

Matrix Spikes:
All percent recoveries and relative percent differences (RPDs) were within acceptance criteria with any exceptions noted below.

Duplicate Sample:
All duplicate sample results were within method acceptance criteria with any exceptions noted below.

Additional Comments:

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PROJECT NARRATIVE

Project: Black Pine Mine
Pace Project No.: 10163645

Method: **ASA 29-3.5.2**
Description: Organic Matter MT ASA 29
Client: Montana Dept. of Environmental Quality
Date: August 12, 2011

General Information:
2 samples were analyzed for ASA 29-3.5.2. All samples were received in acceptable condition with any exceptions noted below.

Hold Time:
The samples were analyzed within the method required hold times with any exceptions noted below.

Initial Calibrations (including MS Tune as applicable):
All criteria were within method requirements with any exceptions noted below.

Continuing Calibration:
All criteria were within method requirements with any exceptions noted below.

Internal Standards:
All internal standards were within QC limits with any exceptions noted below.

Surrogates:
All surrogates were within QC limits with any exceptions noted below.

Method Blank:
All analytes were below the report limit in the method blank with any exceptions noted below.

Laboratory Control Spike:
All laboratory control spike compounds were within QC limits with any exceptions noted below.

Matrix Spikes:
All percent recoveries and relative percent differences (RPDs) were within acceptance criteria with any exceptions noted below.

Duplicate Sample:
All duplicate sample results were within method acceptance criteria with any exceptions noted below.

Additional Comments:

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PROJECT NARRATIVE

Project: Black Pine Mine
Pace Project No.: 10163645

Method: **ASA 10-3.2**
Description: ASA 10-3.2 pH
Client: Montana Dept. of Environmental Quality
Date: August 12, 2011

General Information:
2 samples were analyzed for ASA 10-3.2. All samples were received in acceptable condition with any exceptions noted below.

Hold Time:
The samples were analyzed within the method required hold times with any exceptions noted below.

Initial Calibrations (including MS Tune as applicable):
All criteria were within method requirements with any exceptions noted below.

Continuing Calibration:
All criteria were within method requirements with any exceptions noted below.

Internal Standards:
All internal standards were within QC limits with any exceptions noted below.

Surrogates:
All surrogates were within QC limits with any exceptions noted below.

Method Blank:
All analytes were below the report limit in the method blank with any exceptions noted below.

Laboratory Control Spike:
All laboratory control spike compounds were within QC limits with any exceptions noted below.

Matrix Spikes:
All percent recoveries and relative percent differences (RPDs) were within acceptance criteria with any exceptions noted below.

Duplicate Sample:
All duplicate sample results were within method acceptance criteria with any exceptions noted below.

Additional Comments:

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PROJECT NARRATIVE

Project: Black Pine Mine
Pace Project No.: 10163645

Method: **ASA 24-5.4/SM4500**
Description: SM4500P-E, Total Phosphorus
Client: Montana Dept. of Environmental Quality
Date: August 12, 2011

General Information:
2 samples were analyzed for ASA 24-5.4/SM4500. All samples were received in acceptable condition with any exceptions noted below.

Hold Time:
The samples were analyzed within the method required hold times with any exceptions noted below.

Initial Calibrations (including MS Tune as applicable):
All criteria were within method requirements with any exceptions noted below.

Continuing Calibration:
All criteria were within method requirements with any exceptions noted below.

Internal Standards:
All internal standards were within QC limits with any exceptions noted below.

Surrogates:
All surrogates were within QC limits with any exceptions noted below.

Method Blank:
All analytes were below the report limit in the method blank with any exceptions noted below.

Laboratory Control Spike:
All laboratory control spike compounds were within QC limits with any exceptions noted below.

Matrix Spikes:
All percent recoveries and relative percent differences (RPDs) were within acceptance criteria with any exceptions noted below.

Duplicate Sample:
All duplicate sample results were within method acceptance criteria with any exceptions noted below.

Additional Comments:

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PROJECT NARRATIVE

Project: Black Pine Mine
Pace Project No.: 10163645

Method: **Modified Sobek 3.2**
Description: Sobek Acid Base Potential
Client: Montana Dept. of Environmental Quality
Date: August 12, 2011

General Information:
6 samples were analyzed for Modified Sobek 3.2. All samples were received in acceptable condition with any exceptions noted below.

Hold Time:
The samples were analyzed within the method required hold times with any exceptions noted below.

Initial Calibrations (including MS Tune as applicable):
All criteria were within method requirements with any exceptions noted below.

Continuing Calibration:
All criteria were within method requirements with any exceptions noted below.

Internal Standards:
All internal standards were within QC limits with any exceptions noted below.

Surrogates:
All surrogates were within QC limits with any exceptions noted below.

Method Blank:
All analytes were below the report limit in the method blank with any exceptions noted below.

Laboratory Control Spike:
All laboratory control spike compounds were within QC limits with any exceptions noted below.

Matrix Spikes:
All percent recoveries and relative percent differences (RPDs) were within acceptance criteria with any exceptions noted below.

Duplicate Sample:
All duplicate sample results were within method acceptance criteria with any exceptions noted below.

Additional Comments:

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PROJECT NARRATIVE

Project: Black Pine Mine
Pace Project No.: 10163645

Method: **Modified Sobek 3.2**
Description: Sobek Extractable Sulfur
Client: Montana Dept. of Environmental Quality
Date: August 12, 2011

General Information:
6 samples were analyzed for Modified Sobek 3.2. All samples were received in acceptable condition with any exceptions noted below.

Hold Time:
The samples were analyzed within the method required hold times with any exceptions noted below.

Initial Calibrations (including MS Tune as applicable):
All criteria were within method requirements with any exceptions noted below.

Continuing Calibration:
All criteria were within method requirements with any exceptions noted below.

Internal Standards:
All internal standards were within QC limits with any exceptions noted below.

Surrogates:
All surrogates were within QC limits with any exceptions noted below.

Method Blank:
All analytes were below the report limit in the method blank with any exceptions noted below.

Laboratory Control Spike:
All laboratory control spike compounds were within QC limits with any exceptions noted below.

Matrix Spikes:
All percent recoveries and relative percent differences (RPDs) were within acceptance criteria with any exceptions noted below.

Duplicate Sample:
All duplicate sample results were within method acceptance criteria with any exceptions noted below.

Additional Comments:

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PROJECT NARRATIVE

Project: Black Pine Mine
Pace Project No.: 10163645

Method: **Modified Sobek 3.2**
Description: Sobek Calculations
Client: Montana Dept. of Environmental Quality
Date: August 12, 2011

General Information:
6 samples were analyzed for Modified Sobek 3.2. All samples were received in acceptable condition with any exceptions noted below.

Hold Time:
The samples were analyzed within the method required hold times with any exceptions noted below.

Initial Calibrations (including MS Tune as applicable):
All criteria were within method requirements with any exceptions noted below.

Continuing Calibration:
All criteria were within method requirements with any exceptions noted below.

Internal Standards:
All internal standards were within QC limits with any exceptions noted below.

Surrogates:
All surrogates were within QC limits with any exceptions noted below.

Method Blank:
All analytes were below the report limit in the method blank with any exceptions noted below.

Laboratory Control Spike:
All laboratory control spike compounds were within QC limits with any exceptions noted below.

Matrix Spikes:
All percent recoveries and relative percent differences (RPDs) were within acceptance criteria with any exceptions noted below.

Duplicate Sample:
All duplicate sample results were within method acceptance criteria with any exceptions noted below.

Additional Comments:

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PROJECT NARRATIVE

Project: Black Pine Mine
Pace Project No.: 10163645

Method: **Modified Sobek 3.2**
Description: Sobek SMP Buffer pH
Client: Montana Dept. of Environmental Quality
Date: August 12, 2011

General Information:
6 samples were analyzed for Modified Sobek 3.2. All samples were received in acceptable condition with any exceptions noted below.

Hold Time:
The samples were analyzed within the method required hold times with any exceptions noted below.

Initial Calibrations (including MS Tune as applicable):
All criteria were within method requirements with any exceptions noted below.

Continuing Calibration:
All criteria were within method requirements with any exceptions noted below.

Internal Standards:
All internal standards were within QC limits with any exceptions noted below.

Surrogates:
All surrogates were within QC limits with any exceptions noted below.

Method Blank:
All analytes were below the report limit in the method blank with any exceptions noted below.

Laboratory Control Spike:
All laboratory control spike compounds were within QC limits with any exceptions noted below.

Matrix Spikes:
All percent recoveries and relative percent differences (RPDs) were within acceptance criteria with any exceptions noted below.

Duplicate Sample:
All duplicate sample results were within method acceptance criteria with any exceptions noted below.

Additional Comments:

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PROJECT NARRATIVE

Project: Black Pine Mine
Pace Project No.: 10163645

Method: **ASA 10-3.3**
Description: ASA10-3.3 Specific Conductance
Client: Montana Dept. of Environmental Quality
Date: August 12, 2011

General Information:
2 samples were analyzed for ASA 10-3.3. All samples were received in acceptable condition with any exceptions noted below.

Hold Time:
The samples were analyzed within the method required hold times with any exceptions noted below.

Initial Calibrations (including MS Tune as applicable):
All criteria were within method requirements with any exceptions noted below.

Continuing Calibration:
All criteria were within method requirements with any exceptions noted below.

Internal Standards:
All internal standards were within QC limits with any exceptions noted below.

Surrogates:
All surrogates were within QC limits with any exceptions noted below.

Method Blank:
All analytes were below the report limit in the method blank with any exceptions noted below.

Laboratory Control Spike:
All laboratory control spike compounds were within QC limits with any exceptions noted below.

Matrix Spikes:
All percent recoveries and relative percent differences (RPDs) were within acceptance criteria with any exceptions noted below.

Duplicate Sample:
All duplicate sample results were within method acceptance criteria with any exceptions noted below.

QC Batch: MT/6547

D6: The relative percent difference (RPD) between the sample and sample duplicate exceeded laboratory control limits.

- DUP (Lab ID: 1022943)
  - Sp.Conductance Saturated Paste

Additional Comments:

This data package has been reviewed for quality and completeness and is approved for release.

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ANALYTICAL RESULTS

Project: Black Pine Mine
Pace Project No.: 10163645

Sample: BP-CML-TS-11-01 **Lab ID: 10163645001** Collected: 07/15/11 07:35 Received: 07/16/11 11:30 Matrix: Solid

Results reported on a "dry-weight" basis

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
6010 MET ICP, MDEQ Potassium	Analytical Method: CLPICPAES Preparation Method: ASA 13-3.5.2.2							
Potassium	**<120**	mg/kg	120	5	08/01/11 17:34	08/01/11 19:34	7440-09-7	
Cation Exchange Capacity	Analytical Method: EPA 9081							
Cation Exchange Capacity	**14.7**	meq/100g	0.98	10	08/03/11 14:00	08/05/11 13:31		
6020 MET ICPMS	Analytical Method: EPA 6020 Preparation Method: EPA 3050							
Antimony	**0.63**	mg/kg	0.49	20	07/25/11 07:59	07/28/11 01:22	7440-36-0	M6
Arsenic	**6.1**	mg/kg	0.49	20	07/25/11 07:59	07/28/11 01:22	7440-38-2	
Barium	**116**	mg/kg	0.29	20	07/25/11 07:59	07/28/11 01:22	7440-39-3	M6
Cadmium	**0.079**	mg/kg	0.078	20	07/25/11 07:59	07/28/11 01:22	7440-43-9	
Chromium	**10.9**	mg/kg	0.49	20	07/25/11 07:59	07/28/11 01:22	7440-47-3	
Copper	**9.6**	mg/kg	0.49	20	07/25/11 07:59	07/28/11 01:22	7440-50-8	
Iron	**19300**	mg/kg	48.6	20	07/25/11 07:59	07/28/11 01:22	7439-89-6	M6
Lead	**12.1**	mg/kg	0.097	20	07/25/11 07:59	07/28/11 01:22	7439-92-1	
Manganese	**224**	mg/kg	0.49	20	07/25/11 07:59	07/28/11 01:22	7439-96-5	M6
Nickel	**6.0**	mg/kg	0.49	20	07/25/11 07:59	07/28/11 01:22	7440-02-0	
Silver	**<0.49**	mg/kg	0.49	20	07/25/11 07:59	07/28/11 14:08	7440-22-4	
Zinc	**22.8**	mg/kg	4.9	20	07/25/11 07:59	07/28/11 01:22	7440-66-6	
7471 Mercury	Analytical Method: EPA 7471 Preparation Method: EPA 7471							
Mercury	**0.023**	mg/kg	0.022	1	07/22/11 14:31	08/01/11 14:15	7439-97-6	
Dry Weight	Analytical Method: % Moisture							
Percent Moisture	**9.7**	%	0.10	1		07/25/11 00:00		
353.2 Nitrate + Nitrite pres.	Analytical Method: ASA 33-3.2/EPA 353.2							
Available Nitrate	**<5.0**	mg/kg	5.0	1		07/26/11 18:21		
Coarse	Analytical Method: ASTM D421							
Coarse Fragment	**21.9**	% (w/w)	0.10	1		07/26/11 12:15		
Organic Matter MT ASA 29	Analytical Method: ASA 29-3.5.2							
Organic Matter	**0.81**	% (w/w)	0.10	1		07/21/11 16:50		
ASA 10-3.2 pH	Analytical Method: ASA 10-3.2							
pH, Saturated Paste	**6.9**	Std. Units	0.10	1		07/27/11 17:42		
SM4500P-E, Total Phosphorus	Analytical Method: ASA 24-5.4/SM4500							
Available Phosphorus	**<1.0**	mg/kg	1.0	1		07/25/11 14:52	7723-14-0	
Sobek Acid Base Potential	Analytical Method: Modified Sobek 3.2							
Neutralization Potential	**2.0**	tons/1000	0.50	1		08/02/11 00:00		

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ANALYTICAL RESULTS

Project: Black Pine Mine
Pace Project No.: 10163645

Sample: BP-CML-TS-11-01 **Lab ID: 10163645001** Collected: 07/15/11 07:35 Received: 07/16/11 11:30 Matrix: Solid

Results reported on a "dry-weight" basis

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
Sobek Extractable Sulfur	Analytical Method: Modified Sobek 3.2							
Sulfur, HCl Extractable	**<0.050**	% (w/w)	0.050	1		08/09/11 11:16		
Sulfur, HNO3 Extractable	**<0.050**	% (w/w)	0.050	1		08/09/11 11:16		
Sulfur, Hot Water Extractable	**<0.050**	% (w/w)	0.050	1		08/09/11 11:16		
Sulfur, Residual	**<0.050**	% (w/w)	0.050	1		08/09/11 11:16		
Total Sulfur	**<0.050**	% (w/w)	0.050	1		08/09/11 11:16		
Sobek Calculations	Analytical Method: Modified Sobek 3.2							
Acid/Base Potential	**1.8**	tons/1000		1		08/02/11 00:00		
Acid Potential	**0.20**	tons/1000	4.3	1		08/02/11 00:00		
Lime Requirement	**1.5**	tons/1000	5.4	1		08/02/11 00:00		
SMP Lime Requirement	**1.0**	tons/1000	0.0	1		08/02/11 00:00		
Sobek SMP Buffer pH	Analytical Method: Modified Sobek 3.2							
SMP Buffer pH	**6.8**	Std. Units	0.10	1		07/29/11 14:34		
ASA10-3.3 Specific Conductance	Analytical Method: ASA 10-3.3							
Sp.Conductance Saturated Paste	**0.20**	mmhos/cm	0.010	1		07/27/11 12:56		

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ANALYTICAL RESULTS

Project: Black Pine Mine
Pace Project No.: 10163645

Sample: BP-CML-TS-11-08 **Lab ID: 10163645002** Collected: 07/15/11 07:40 Received: 07/16/11 11:30 Matrix: Solid

Results reported on a "dry-weight" basis

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
6010 MET ICP, MDEQ Potassium	Analytical Method: CLPICPAES Preparation Method: ASA 13-3.5.2.2							
Potassium	**<118**	mg/kg	118	5	08/01/11 17:34	08/01/11 19:38	7440-09-7	
Cation Exchange Capacity	Analytical Method: EPA 9081							
Cation Exchange Capacity	**30.3**	meq/100g	1.0	10	08/03/11 14:00	08/05/11 13:44		
6020 MET ICPMS	Analytical Method: EPA 6020 Preparation Method: EPA 3050							
Antimony	**0.49**	mg/kg	0.46	20	07/25/11 07:59	07/28/11 01:29	7440-36-0	
Arsenic	**6.2**	mg/kg	0.46	20	07/25/11 07:59	07/28/11 01:29	7440-38-2	
Barium	**109**	mg/kg	0.28	20	07/25/11 07:59	07/28/11 01:29	7440-39-3	
Cadmium	**0.15**	mg/kg	0.074	20	07/25/11 07:59	07/28/11 01:29	7440-43-9	
Chromium	**16.7**	mg/kg	0.46	20	07/25/11 07:59	07/28/11 01:29	7440-47-3	
Copper	**11.0**	mg/kg	0.46	20	07/25/11 07:59	07/28/11 01:29	7440-50-8	
Iron	**28300**	mg/kg	231	100	07/25/11 07:59	07/28/11 01:32	7439-89-6	
Lead	**12.0**	mg/kg	0.092	20	07/25/11 07:59	07/28/11 01:29	7439-92-1	
Manganese	**374**	mg/kg	0.46	20	07/25/11 07:59	07/28/11 01:29	7439-96-5	
Nickel	**8.7**	mg/kg	0.46	20	07/25/11 07:59	07/28/11 01:29	7440-02-0	
Silver	**<0.46**	mg/kg	0.46	20	07/25/11 07:59	07/28/11 14:11	7440-22-4	
Zinc	**54.7**	mg/kg	4.6	20	07/25/11 07:59	07/28/11 01:29	7440-66-6	
7471 Mercury	Analytical Method: EPA 7471 Preparation Method: EPA 7471							
Mercury	**6.8**	mg/kg	0.24	10	07/22/11 14:31	08/01/11 14:27	7439-97-6	
Dry Weight	Analytical Method: % Moisture							
Percent Moisture	**12.5**	%	0.10	1		07/25/11 00:00		
353.2 Nitrate + Nitrite pres.	Analytical Method: ASA 33-3.2/EPA 353.2							
Available Nitrate	**<5.0**	mg/kg	5.0	1		07/26/11 18:23		
Coarse	Analytical Method: ASTM D421							
Coarse Fragment	**34.4**	% (w/w)	0.10	1		07/26/11 12:15		
Organic Matter MT ASA 29	Analytical Method: ASA 29-3.5.2							
Organic Matter	**<0.10**	% (w/w)	0.10	1		07/21/11 16:50		
ASA 10-3.2 pH	Analytical Method: ASA 10-3.2							
pH, Saturated Paste	**6.7**	Std. Units	0.10	1		07/27/11 17:44		
SM4500P-E, Total Phosphorus	Analytical Method: ASA 24-5.4/SM4500							
Available Phosphorus	**<1.0**	mg/kg	1.0	1		07/25/11 14:52	7723-14-0	
Sobek Acid Base Potential	Analytical Method: Modified Sobek 3.2							
Neutralization Potential	**4.4**	tons/1000	0.50	1		08/02/11 00:00		

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ANALYTICAL RESULTS

Project: Black Pine Mine
Pace Project No.: 10163645

Sample: BP-CML-TS-11-08 **Lab ID: 10163645002** Collected: 07/15/11 07:40 Received: 07/16/11 11:30 Matrix: Solid

Results reported on a "dry-weight" basis

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
Sobek Extractable Sulfur	Analytical Method: Modified Sobek 3.2							
Sulfur, HCl Extractable	**<0.050**	% (w/w)	0.050	1		08/09/11 11:45		
Sulfur, HNO3 Extractable	**<0.050**	% (w/w)	0.050	1		08/09/11 11:45		
Sulfur, Hot Water Extractable	**<0.050**	% (w/w)	0.050	1		08/09/11 11:45		
Sulfur, Residual	**<0.050**	% (w/w)	0.050	1		08/09/11 11:45		
Total Sulfur	**<0.050**	% (w/w)	0.050	1		08/09/11 11:45		
Sobek Calculations	Analytical Method: Modified Sobek 3.2							
Acid/Base Potential	**4.4**	tons/1000		1		08/02/11 00:00		
Acid Potential	**<4.3**	tons/1000	4.3	1		08/02/11 00:00		
Lime Requirement	**<5.4**	tons/1000	5.4	1		08/02/11 00:00		
SMP Lime Requirement	**1.0**	tons/1000	0.0	1		08/02/11 00:00		
Sobek SMP Buffer pH	Analytical Method: Modified Sobek 3.2							
SMP Buffer pH	**6.8**	Std. Units	0.10	1		07/29/11 14:34		
ASA10-3.3 Specific Conductance	Analytical Method: ASA 10-3.3							
Sp.Conductance Saturated Paste	**0.17**	mmhos/cm	0.010	1		07/27/11 12:56		

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ANALYTICAL RESULTS

Project: Black Pine Mine
Pace Project No.: 10163645

Sample: BP-CML-TS-10-00 **Lab ID: 10163645003** Collected: 07/15/11 08:50 Received: 07/16/11 11:30 Matrix: Solid

Results reported on a "dry-weight" basis

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
6020 MET ICPMS	Analytical Method: EPA 6020 Preparation Method: EPA 3050							
Antimony	**1090**	mg/kg	2.5	100	07/25/11 07:59	07/28/11 01:39	7440-36-0	
Arsenic	**1250**	mg/kg	2.5	100	07/25/11 07:59	07/28/11 01:39	7440-38-2	
Barium	**378**	mg/kg	0.30	20	07/25/11 07:59	07/28/11 01:36	7440-39-3	
Cadmium	**5.8**	mg/kg	0.080	20	07/25/11 07:59	07/28/11 01:36	7440-43-9	
Chromium	**<0.50**	mg/kg	0.50	20	07/25/11 07:59	07/28/11 01:36	7440-47-3	
Copper	**2160**	mg/kg	10.1	400	07/25/11 07:59	07/29/11 09:42	7440-50-8	
Iron	**42900**	mg/kg	251	100	07/25/11 07:59	07/28/11 01:39	7439-89-6	
Lead	**8010**	mg/kg	2.0	400	07/25/11 07:59	07/29/11 09:42	7439-92-1	
Manganese	**254**	mg/kg	0.50	20	07/25/11 07:59	07/28/11 01:36	7439-96-5	
Nickel	**1.8**	mg/kg	0.50	20	07/25/11 07:59	07/28/11 01:36	7440-02-0	
Silver	**62.3**	mg/kg	2.5	100	07/25/11 07:59	07/28/11 14:15	7440-22-4	
Zinc	**989**	mg/kg	25.1	100	07/25/11 07:59	07/28/11 01:39	7440-66-6	
7471 Mercury	Analytical Method: EPA 7471 Preparation Method: EPA 7471							
Mercury	**0.33**	mg/kg	0.021	1	07/22/11 14:31	08/01/11 14:34	7439-97-6	
Dry Weight	Analytical Method: % Moisture							
Percent Moisture	**12.0**	%	0.10	1		07/25/11 00:00		
Sobek Acid Base Potential	Analytical Method: Modified Sobek 3.2							
Neutralization Potential	**<0.5**	tons/1000	0.50	1		08/02/11 00:00		
Sobek Extractable Sulfur	Analytical Method: Modified Sobek 3.2							
Sulfur, HCl Extractable	**0.0825**	% (w/w)	0.050	1		08/09/11 11:57		
Sulfur, HNO3 Extractable	**<0.050**	% (w/w)	0.050	1		08/09/11 11:57		
Sulfur, Hot Water Extractable	**0.144**	% (w/w)	0.050	1		08/09/11 11:57		
Sulfur, Residual	**<0.050**	% (w/w)	0.050	1		08/09/11 11:57		
Total Sulfur	**0.227**	% (w/w)	0.050	1		08/09/11 11:57		
Sobek Calculations	Analytical Method: Modified Sobek 3.2							
Acid/Base Potential	**0**	tons/1000		1		08/02/11 00:00		
Acid Potential	**<4.3**	tons/1000	4.3	1		08/02/11 00:00		
Lime Requirement	**<5.4**	tons/1000	5.4	1		08/02/11 00:00		
SMP Lime Requirement	**0.30**	tons/1000	0.0	1		08/02/11 00:00		
Sobek SMP Buffer pH	Analytical Method: Modified Sobek 3.2							
SMP Buffer pH	**6.9**	Std. Units	0.10	1		07/29/11 14:34		

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ANALYTICAL RESULTS

Project: Black Pine Mine
Pace Project No.: 10163645

Sample: BP-CML-TS-10-02 **Lab ID: 10163645004** Collected: 07/15/11 08:52 Received: 07/16/11 11:30 Matrix: Solid

Results reported on a "dry-weight" basis

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
6020 MET ICPMS	Analytical Method: EPA 6020 Preparation Method: EPA 3050							
Antimony	**1110**	mg/kg	2.4	100	07/25/11 07:59	07/28/11 02:08	7440-36-0	
Arsenic	**1400**	mg/kg	2.4	100	07/25/11 07:59	07/28/11 02:08	7440-38-2	
Barium	**616**	mg/kg	1.4	100	07/25/11 07:59	07/28/11 02:08	7440-39-3	
Cadmium	**4.4**	mg/kg	0.077	20	07/25/11 07:59	07/28/11 02:04	7440-43-9	
Chromium	**<0.48**	mg/kg	0.48	20	07/25/11 07:59	07/28/11 02:04	7440-47-3	
Copper	**1340**	mg/kg	2.4	100	07/25/11 07:59	07/28/11 02:08	7440-50-8	
Iron	**21600**	mg/kg	47.9	20	07/25/11 07:59	07/28/11 02:04	7439-89-6	
Lead	**2490**	mg/kg	0.96	200	07/25/11 07:59	07/29/11 09:45	7439-92-1	
Manganese	**169**	mg/kg	0.48	20	07/25/11 07:59	07/28/11 02:04	7439-96-5	
Nickel	**<0.48**	mg/kg	0.48	20	07/25/11 07:59	07/28/11 02:04	7440-02-0	
Silver	**10.5**	mg/kg	2.4	100	07/25/11 07:59	07/28/11 14:18	7440-22-4	
Zinc	**419**	mg/kg	4.8	20	07/25/11 07:59	07/28/11 02:04	7440-66-6	
7471 Mercury	Analytical Method: EPA 7471 Preparation Method: EPA 7471							
Mercury	**0.59**	mg/kg	0.024	1	07/22/11 14:31	08/01/11 14:42	7439-97-6	
Dry Weight	Analytical Method: % Moisture							
Percent Moisture	**25.0**	%	0.10	1		07/25/11 00:00		

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ANALYTICAL RESULTS

Project: Black Pine Mine
Pace Project No.: 10163645

Sample: BP-CML-SS-10-06 **Lab ID: 10163645005** Collected: 07/15/11 08:54 Received: 07/16/11 11:30 Matrix: Solid

Results reported on a "dry-weight" basis

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
6020 MET ICPMS	Analytical Method: EPA 6020 Preparation Method: EPA 3050							
Antimony	**162**	mg/kg	0.45	20	07/25/11 07:59	07/28/11 02:11	7440-36-0	
Arsenic	**173**	mg/kg	0.45	20	07/25/11 07:59	07/28/11 02:11	7440-38-2	
Barium	**178**	mg/kg	0.27	20	07/25/11 07:59	07/28/11 02:11	7440-39-3	
Cadmium	**1.7**	mg/kg	0.072	20	07/25/11 07:59	07/28/11 02:11	7440-43-9	
Chromium	**<0.45**	mg/kg	0.45	20	07/25/11 07:59	07/28/11 02:11	7440-47-3	
Copper	**606**	mg/kg	2.2	100	07/25/11 07:59	07/28/11 02:15	7440-50-8	
Iron	**49500**	mg/kg	224	100	07/25/11 07:59	07/28/11 02:15	7439-89-6	
Lead	**1830**	mg/kg	0.45	100	07/25/11 07:59	07/28/11 02:15	7439-92-1	
Manganese	**1050**	mg/kg	2.2	100	07/25/11 07:59	07/28/11 02:15	7439-96-5	
Nickel	**7.9**	mg/kg	0.45	20	07/25/11 07:59	07/28/11 02:11	7440-02-0	
Silver	**9.5**	mg/kg	2.2	100	07/25/11 07:59	07/28/11 14:21	7440-22-4	
Zinc	**251**	mg/kg	4.5	20	07/25/11 07:59	07/28/11 02:11	7440-66-6	
7471 Mercury	Analytical Method: EPA 7471 Preparation Method: EPA 7471							
Mercury	**0.77**	mg/kg	0.023	1	07/22/11 14:31	08/01/11 15:01	7439-97-6	
Dry Weight	Analytical Method: % Moisture							
Percent Moisture	**17.2**	%	0.10	1		07/25/11 00:00		

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ANALYTICAL RESULTS

Project: Black Pine Mine
Pace Project No.: 10163645

Sample: BP-CML-TS-01-00 **Lab ID: 10163645006** Collected: 07/15/11 09:40 Received: 07/16/11 11:30 Matrix: Solid

Results reported on a "dry-weight" basis

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
6020 MET ICPMS	Analytical Method: EPA 6020 Preparation Method: EPA 3050							
Antimony	**324**	mg/kg	0.51	20	07/25/11 07:59	07/28/11 02:18	7440-36-0	
Arsenic	**262**	mg/kg	0.51	20	07/25/11 07:59	07/28/11 02:18	7440-38-2	
Barium	**240**	mg/kg	0.31	20	07/25/11 07:59	07/28/11 02:18	7440-39-3	
Cadmium	**8.9**	mg/kg	0.082	20	07/25/11 07:59	07/28/11 02:18	7440-43-9	
Chromium	**3.3**	mg/kg	0.51	20	07/25/11 07:59	07/28/11 02:18	7440-47-3	
Copper	**1680**	mg/kg	2.6	100	07/25/11 07:59	07/28/11 02:22	7440-50-8	
Iron	**16900**	mg/kg	51.4	20	07/25/11 07:59	07/28/11 02:18	7439-89-6	
Lead	**2300**	mg/kg	0.51	100	07/25/11 07:59	07/28/11 02:22	7439-92-1	
Manganese	**620**	mg/kg	2.6	100	07/25/11 07:59	07/28/11 02:22	7439-96-5	
Nickel	**5.7**	mg/kg	0.51	20	07/25/11 07:59	07/28/11 02:18	7440-02-0	
Silver	**26.5**	mg/kg	2.6	100	07/25/11 07:59	07/28/11 14:25	7440-22-4	
Zinc	**198**	mg/kg	5.1	20	07/25/11 07:59	07/28/11 02:18	7440-66-6	
7471 Mercury	Analytical Method: EPA 7471 Preparation Method: EPA 7471							
Mercury	**0.24**	mg/kg	0.022	1	07/22/11 14:31	08/01/11 15:03	7439-97-6	
Dry Weight	Analytical Method: % Moisture							
Percent Moisture	**10.7**	%	0.10	1		07/25/11 00:00		

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ANALYTICAL RESULTS

Project: Black Pine Mine
Pace Project No.: 10163645

Sample: BP-CML-TS-01-02 **Lab ID: 10163645007** Collected: 07/15/11 09:42 Received: 07/16/11 11:30 Matrix: Solid

Results reported on a "dry-weight" basis

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
6020 MET ICPMS	Analytical Method: EPA 6020 Preparation Method: EPA 3050							
Antimony	**23.3**	mg/kg	0.79	20	07/25/11 07:59	07/28/11 02:25	7440-36-0	
Arsenic	**24.2**	mg/kg	0.79	20	07/25/11 07:59	07/28/11 02:25	7440-38-2	
Barium	**483**	mg/kg	0.47	20	07/25/11 07:59	07/28/11 02:25	7440-39-3	
Cadmium	**8.7**	mg/kg	0.13	20	07/25/11 07:59	07/28/11 02:25	7440-43-9	
Chromium	**15.0**	mg/kg	0.79	20	07/25/11 07:59	07/28/11 02:25	7440-47-3	
Copper	**2140**	mg/kg	3.9	100	07/25/11 07:59	07/28/11 02:29	7440-50-8	
Iron	**13300**	mg/kg	78.8	20	07/25/11 07:59	07/28/11 02:25	7439-89-6	
Lead	**144**	mg/kg	0.16	20	07/25/11 07:59	07/28/11 02:25	7439-92-1	
Manganese	**269**	mg/kg	0.79	20	07/25/11 07:59	07/28/11 02:25	7439-96-5	
Nickel	**13.3**	mg/kg	0.79	20	07/25/11 07:59	07/28/11 02:25	7440-02-0	
Silver	**1.3**	mg/kg	0.79	20	07/25/11 07:59	07/28/11 15:15	7440-22-4	
Zinc	**213**	mg/kg	7.9	20	07/25/11 07:59	07/28/11 02:25	7440-66-6	
7471 Mercury	Analytical Method: EPA 7471 Preparation Method: EPA 7471							
Mercury	**1.0**	mg/kg	0.026	1	07/22/11 14:31	08/01/11 15:05	7439-97-6	
Dry Weight	Analytical Method: % Moisture							
Percent Moisture	**40.1**	%	0.10	1		07/25/11 00:00		
Sobek Acid Base Potential	Analytical Method: Modified Sobek 3.2							
Neutralization Potential	**2.2**	tons/1000	0.50	1		08/02/11 00:00		
Sobek Extractable Sulfur	Analytical Method: Modified Sobek 3.2							
Sulfur, HCl Extractable	**<0.050**	% (w/w)	0.050	1		08/09/11 12:29		
Sulfur, HNO3 Extractable	**<0.050**	% (w/w)	0.050	1		08/09/11 12:29		
Sulfur, Hot Water Extractable	**<0.050**	% (w/w)	0.050	1		08/09/11 12:29		
Sulfur, Residual	**<0.050**	% (w/w)	0.050	1		08/09/11 12:29		
Total Sulfur	**<0.050**	% (w/w)	0.050	1		08/09/11 12:29		
Sobek Calculations	Analytical Method: Modified Sobek 3.2							
Acid/Base Potential	**2.2**	tons/1000		1		08/02/11 00:00		
Acid Potential	**<4.3**	tons/1000	4.3	1		08/02/11 00:00		
Lime Requirement	**8.1**	tons/1000	5.4	1		08/02/11 00:00		
SMP Lime Requirement	**5.9**	tons/1000	0.0	1		08/02/11 00:00		
Sobek SMP Buffer pH	Analytical Method: Modified Sobek 3.2							
SMP Buffer pH	**5.9**	Std. Units	0.10	1		07/29/11 14:34		

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ANALYTICAL RESULTS

Project: Black Pine Mine
Pace Project No.: 10163645

Sample: BP-CML-SS-01-06 **Lab ID: 10163645008** Collected: 07/15/11 09:45 Received: 07/16/11 11:30 Matrix: Solid

Results reported on a "dry-weight" basis

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
6020 MET ICPMS	Analytical Method: EPA 6020 Preparation Method: EPA 3050							
Antimony	**167**	mg/kg	0.61	20	07/25/11 07:59	07/28/11 02:32	7440-36-0	
Arsenic	**123**	mg/kg	0.61	20	07/25/11 07:59	07/28/11 02:32	7440-38-2	
Barium	**229**	mg/kg	0.37	20	07/25/11 07:59	07/28/11 02:32	7440-39-3	
Cadmium	**8.3**	mg/kg	0.098	20	07/25/11 07:59	07/28/11 02:32	7440-43-9	
Chromium	**5.7**	mg/kg	0.61	20	07/25/11 07:59	07/28/11 02:32	7440-47-3	
Copper	**2570**	mg/kg	3.1	100	07/25/11 07:59	07/28/11 02:36	7440-50-8	
Iron	**12800**	mg/kg	61.2	20	07/25/11 07:59	07/28/11 02:32	7439-89-6	
Lead	**1120**	mg/kg	0.61	100	07/25/11 07:59	07/28/11 02:36	7439-92-1	
Manganese	**1300**	mg/kg	3.1	100	07/25/11 07:59	07/28/11 02:36	7439-96-5	
Nickel	**6.8**	mg/kg	0.61	20	07/25/11 07:59	07/28/11 02:32	7440-02-0	
Silver	**14.1**	mg/kg	0.61	20	07/25/11 07:59	07/28/11 14:53	7440-22-4	
Zinc	**163**	mg/kg	6.1	20	07/25/11 07:59	07/28/11 02:32	7440-66-6	
7471 Mercury	Analytical Method: EPA 7471 Preparation Method: EPA 7471							
Mercury	**0.35**	mg/kg	0.027	1	07/22/11 14:31	08/01/11 15:07	7439-97-6	
Dry Weight	Analytical Method: % Moisture							
Percent Moisture	**37.2**	%	0.10	1		07/25/11 00:00		

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ANALYTICAL RESULTS

Project: Black Pine Mine
Pace Project No.: 10163645

Sample: BP-CML-TS-02-00 **Lab ID: 10163645009** Collected: 07/15/11 10:10 Received: 07/16/11 11:30 Matrix: Solid

Results reported on a "dry-weight" basis

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
6020 MET ICPMS	Analytical Method: EPA 6020 Preparation Method: EPA 3050							
Antimony	**6.9**	mg/kg	0.40	20	07/25/11 07:59	07/28/11 02:50	7440-36-0	
Arsenic	**11.2**	mg/kg	0.40	20	07/25/11 07:59	07/28/11 02:50	7440-38-2	
Barium	**34.7**	mg/kg	0.24	20	07/25/11 07:59	07/28/11 02:50	7440-39-3	
Cadmium	**0.84**	mg/kg	0.064	20	07/25/11 07:59	07/28/11 02:50	7440-43-9	
Chromium	**2.3**	mg/kg	0.40	20	07/25/11 07:59	07/28/11 02:50	7440-47-3	
Copper	**846**	mg/kg	2.0	100	07/25/11 07:59	07/28/11 02:53	7440-50-8	
Iron	**7930**	mg/kg	40.0	20	07/25/11 07:59	07/28/11 02:50	7439-89-6	
Lead	**32.3**	mg/kg	0.080	20	07/25/11 07:59	07/28/11 02:50	7439-92-1	
Manganese	**147**	mg/kg	0.40	20	07/25/11 07:59	07/28/11 02:50	7439-96-5	
Nickel	**4.5**	mg/kg	0.40	20	07/25/11 07:59	07/28/11 02:50	7440-02-0	
Silver	**0.52**	mg/kg	0.40	20	07/25/11 07:59	07/28/11 15:19	7440-22-4	
Zinc	**60.6**	mg/kg	4.0	20	07/25/11 07:59	07/28/11 02:50	7440-66-6	
7471 Mercury	Analytical Method: EPA 7471 Preparation Method: EPA 7471							
Mercury	**0.30**	mg/kg	0.021	1	07/22/11 14:31	08/01/11 15:09	7439-97-6	M1
Dry Weight	Analytical Method: % Moisture							
Percent Moisture	**14.3**	%	0.10	1		07/25/11 00:00		

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ANALYTICAL RESULTS

Project: Black Pine Mine
Pace Project No.: 10163645

Sample: BP-CML-TS-02-02 **Lab ID: 10163645010** Collected: 07/15/11 10:15 Received: 07/16/11 11:30 Matrix: Solid

Results reported on a "dry-weight" basis

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
6020 MET ICPMS	Analytical Method: EPA 6020 Preparation Method: EPA 3050							
Antimony	**7.5**	mg/kg	0.74	20	07/25/11 07:59	07/28/11 02:57	7440-36-0	
Arsenic	**11.3**	mg/kg	0.74	20	07/25/11 07:59	07/28/11 02:57	7440-38-2	
Barium	**365**	mg/kg	0.44	20	07/25/11 07:59	07/28/11 02:57	7440-39-3	
Cadmium	**2.3**	mg/kg	0.12	20	07/25/11 07:59	07/28/11 02:57	7440-43-9	
Chromium	**10.1**	mg/kg	0.74	20	07/25/11 07:59	07/28/11 02:57	7440-47-3	
Copper	**92.0**	mg/kg	0.74	20	07/25/11 07:59	07/28/11 02:57	7440-50-8	
Iron	**9680**	mg/kg	73.8	20	07/25/11 07:59	07/28/11 02:57	7439-89-6	
Lead	**44.9**	mg/kg	0.15	20	07/25/11 07:59	07/28/11 02:57	7439-92-1	
Manganese	**297**	mg/kg	0.74	20	07/25/11 07:59	07/28/11 02:57	7439-96-5	
Nickel	**13.9**	mg/kg	0.74	20	07/25/11 07:59	07/28/11 02:57	7440-02-0	
Silver	**1.1**	mg/kg	0.74	20	07/25/11 07:59	07/28/11 15:22	7440-22-4	
Zinc	**159**	mg/kg	7.4	20	07/25/11 07:59	07/28/11 02:57	7440-66-6	
7471 Mercury	Analytical Method: EPA 7471 Preparation Method: EPA 7471							
Mercury	**1.9**	mg/kg	0.30	10	07/25/11 14:10	07/26/11 10:36	7439-97-6	
Dry Weight	Analytical Method: % Moisture							
Percent Moisture	**38.4**	%	0.10	1		07/25/11 00:00		
Sobek Acid Base Potential	Analytical Method: Modified Sobek 3.2							
Neutralization Potential	**3.2**	tons/1000	0.50	1		08/02/11 00:00		
Sobek Extractable Sulfur	Analytical Method: Modified Sobek 3.2							
Sulfur, HCl Extractable	**<0.050**	% (w/w)	0.050	1		08/09/11 12:39		
Sulfur, HNO3 Extractable	**0.0754**	% (w/w)	0.050	1		08/09/11 12:39		
Sulfur, Hot Water Extractable	**0.0697**	% (w/w)	0.050	1		08/09/11 12:39		
Sulfur, Residual	**<0.050**	% (w/w)	0.050	1		08/09/11 12:39		
Total Sulfur	**0.174**	% (w/w)	0.050	1		08/09/11 12:39		
Sobek Calculations	Analytical Method: Modified Sobek 3.2							
Acid/Base Potential	**3.2**	tons/1000		1		08/02/11 00:00		
Acid Potential	**<4.3**	tons/1000	4.3	1		08/02/11 00:00		
Lime Requirement	**11**	tons/1000	5.4	1		08/02/11 00:00		
SMP Lime Requirement	**5.9**	tons/1000	0.0	1		08/02/11 00:00		
Sobek SMP Buffer pH	Analytical Method: Modified Sobek 3.2							
SMP Buffer pH	**5.9**	Std. Units	0.10	1		07/29/11 14:34		

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ANALYTICAL RESULTS

Project: Black Pine Mine
Pace Project No.: 10163645

Sample: BP-CML-SS-02-06 **Lab ID: 10163645011** Collected: 07/15/11 10:17 Received: 07/16/11 11:30 Matrix: Solid

Results reported on a "dry-weight" basis

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
6020 MET ICPMS	Analytical Method: EPA 6020 Preparation Method: EPA 3050							
Antimony	**10**	mg/kg	0.45	20	07/25/11 07:59	07/28/11 03:04	7440-36-0	M6
Arsenic	**11.9**	mg/kg	0.45	20	07/25/11 07:59	07/28/11 03:04	7440-38-2	
Barium	**178**	mg/kg	0.27	20	07/25/11 07:59	07/28/11 03:04	7440-39-3	M6
Cadmium	**3.1**	mg/kg	0.072	20	07/25/11 07:59	07/28/11 03:04	7440-43-9	
Chromium	**6.1**	mg/kg	0.45	20	07/25/11 07:59	07/28/11 03:04	7440-47-3	M6
Copper	**2360**	mg/kg	4.5	200	07/25/11 07:59	07/29/11 09:49	7440-50-8	M6
Iron	**5640**	mg/kg	45.1	20	07/25/11 07:59	07/28/11 03:04	7439-89-6	M6
Lead	**67.7**	mg/kg	0.090	20	07/25/11 07:59	07/28/11 03:04	7439-92-1	M6
Manganese	**67.2**	mg/kg	0.45	20	07/25/11 07:59	07/28/11 03:04	7439-96-5	M6
Nickel	**5.3**	mg/kg	0.45	20	07/25/11 07:59	07/28/11 03:04	7440-02-0	
Silver	**1.0**	mg/kg	0.45	20	07/25/11 07:59	07/28/11 15:26	7440-22-4	
Zinc	**108**	mg/kg	4.5	20	07/25/11 07:59	07/28/11 03:04	7440-66-6	M6
7471 Mercury	Analytical Method: EPA 7471 Preparation Method: EPA 7471							
Mercury	**9.1**	mg/kg	0.55	25	07/25/11 14:10	07/26/11 11:11	7439-97-6	
Dry Weight	Analytical Method: % Moisture							
Percent Moisture	**17.9**	%	0.10	1		07/25/11 00:00		

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ANALYTICAL RESULTS

Project: Black Pine Mine
Pace Project No.: 10163645

Sample: BP-CML-TS-03-00 **Lab ID: 10163645012** Collected: 07/15/11 10:40 Received: 07/16/11 11:30 Matrix: Solid

Results reported on a "dry-weight" basis

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
6020 MET ICPMS	Analytical Method: EPA 6020 Preparation Method: EPA 3050							
Antimony	**1370**	mg/kg	3.0	100	07/25/11 07:59	07/28/11 03:14	7440-36-0	
Arsenic	**1640**	mg/kg	3.0	100	07/25/11 07:59	07/28/11 03:14	7440-38-2	
Barium	**514**	mg/kg	0.36	20	07/25/11 07:59	07/28/11 03:11	7440-39-3	
Cadmium	**31.8**	mg/kg	0.095	20	07/25/11 07:59	07/28/11 03:11	7440-43-9	
Chromium	**<0.60**	mg/kg	0.60	20	07/25/11 07:59	07/28/11 03:11	7440-47-3	
Copper	**5420**	mg/kg	11.9	400	07/25/11 07:59	07/29/11 09:52	7440-50-8	
Iron	**25100**	mg/kg	59.5	20	07/25/11 07:59	07/28/11 03:11	7439-89-6	
Lead	**837**	mg/kg	6.0	1000	07/25/11 07:59	07/29/11 10:49	7439-92-1	
Manganese	**327**	mg/kg	0.60	20	07/25/11 07:59	07/28/11 03:11	7439-96-5	
Nickel	**1.6**	mg/kg	0.60	20	07/25/11 07:59	07/28/11 03:11	7440-02-0	
Silver	**142**	mg/kg	3.0	100	07/25/11 07:59	07/28/11 15:29	7440-22-4	
Zinc	**522**	mg/kg	6.0	20	07/25/11 07:59	07/28/11 03:11	7440-66-6	
7471 Mercury	Analytical Method: EPA 7471 Preparation Method: EPA 7471							
Mercury	**9.9**	mg/kg	0.69	25	07/25/11 14:10	07/26/11 11:13	7439-97-6	
Dry Weight	Analytical Method: % Moisture							
Percent Moisture	**38.2**	%	0.10	1		07/25/11 00:00		

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ANALYTICAL RESULTS

Project: Black Pine Mine
Pace Project No.: 10163645

Sample: BP-CML-TS-03-02 **Lab ID: 10163645013** Collected: 07/15/11 10:43 Received: 07/16/11 11:30 Matrix: Solid

Results reported on a "dry-weight" basis

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
6020 MET ICPMS	Analytical Method: EPA 6020 Preparation Method: EPA 3050							
Antimony	**1730**	mg/kg	2.7	100	07/25/11 07:59	07/28/11 03:36	7440-36-0	
Arsenic	**1610**	mg/kg	2.7	100	07/25/11 07:59	07/28/11 03:36	7440-38-2	
Barium	**471**	mg/kg	0.33	20	07/25/11 07:59	07/28/11 03:18	7440-39-3	
Cadmium	**23.7**	mg/kg	0.087	20	07/25/11 07:59	07/28/11 03:18	7440-43-9	
Chromium	**<0.55**	mg/kg	0.55	20	07/25/11 07:59	07/28/11 03:18	7440-47-3	
Copper	**6240**	mg/kg	10.9	400	07/25/11 07:59	07/29/11 09:56	7440-50-8	
Iron	**29300**	mg/kg	273	100	07/25/11 07:59	07/28/11 03:36	7439-89-6	
Lead	**9390**	mg/kg	2.2	400	07/25/11 07:59	07/29/11 09:56	7439-92-1	
Manganese	**167**	mg/kg	0.55	20	07/25/11 07:59	07/28/11 03:18	7439-96-5	
Nickel	**0.69**	mg/kg	0.55	20	07/25/11 07:59	07/28/11 03:18	7440-02-0	
Silver	**110**	mg/kg	2.7	100	07/25/11 07:59	07/28/11 15:33	7440-22-4	
Zinc	**735**	mg/kg	27.3	100	07/25/11 07:59	07/28/11 03:36	7440-66-6	
7471 Mercury	Analytical Method: EPA 7471 Preparation Method: EPA 7471							
Mercury	**5.5**	mg/kg	0.67	25	07/25/11 14:10	07/26/11 11:15	7439-97-6	
Dry Weight	Analytical Method: % Moisture							
Percent Moisture	**25.5**	%	0.10	1		07/25/11 00:00		
Sobek Acid Base Potential	Analytical Method: Modified Sobek 3.2							
Neutralization Potential	**0.74**	tons/1000	0.50	1		08/02/11 00:00		
Sobek Extractable Sulfur	Analytical Method: Modified Sobek 3.2							
Sulfur, HCl Extractable	**0.0702**	% (w/w)	0.050	1		08/09/11 12:54		
Sulfur, HNO3 Extractable	**<0.050**	% (w/w)	0.050	1		08/09/11 12:54		
Sulfur, Hot Water Extractable	**0.126**	% (w/w)	0.050	1		08/09/11 12:54		
Sulfur, Residual	**<0.050**	% (w/w)	0.050	1		08/09/11 12:54		
Total Sulfur	**0.201**	% (w/w)	0.050	1		08/09/11 12:54		
Sobek Calculations	Analytical Method: Modified Sobek 3.2							
Acid/Base Potential	**0.74**	tons/1000		1		08/02/11 00:00		
Acid Potential	**<4.3**	tons/1000	4.3	1		08/02/11 00:00		
Lime Requirement	**<5.4**	tons/1000	5.4	1		08/02/11 00:00		
SMP Lime Requirement	**0**	tons/1000	0.0	1		08/02/11 00:00		
Sobek SMP Buffer pH	Analytical Method: Modified Sobek 3.2							
SMP Buffer pH	**7.0**	Std. Units	0.10	1		07/29/11 14:34		

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ANALYTICAL RESULTS

Project: Black Pine Mine
Pace Project No.: 10163645

Sample: BP-CML-SS-03-06 **Lab ID: 10163645014** Collected: 07/15/11 10:45 Received: 07/16/11 11:30 Matrix: Solid

Results reported on a "dry-weight" basis

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
6020 MET ICPMS	Analytical Method: EPA 6020 Preparation Method: EPA 3050							
Antimony	**750**	mg/kg	2.5	100	07/25/11 07:59	07/28/11 03:43	7440-36-0	
Arsenic	**777**	mg/kg	2.5	100	07/25/11 07:59	07/28/11 03:43	7440-38-2	
Barium	**370**	mg/kg	0.30	20	07/25/11 07:59	07/28/11 03:39	7440-39-3	
Cadmium	**15.0**	mg/kg	0.080	20	07/25/11 07:59	07/28/11 03:39	7440-43-9	
Chromium	**<0.50**	mg/kg	0.50	20	07/25/11 07:59	07/28/11 03:39	7440-47-3	
Copper	**3840**	mg/kg	10	400	07/25/11 07:59	07/29/11 09:59	7440-50-8	
Iron	**16200**	mg/kg	49.9	20	07/25/11 07:59	07/28/11 03:39	7439-89-6	
Lead	**5310**	mg/kg	2.0	400	07/25/11 07:59	07/29/11 09:59	7439-92-1	
Manganese	**136**	mg/kg	0.50	20	07/25/11 07:59	07/28/11 03:39	7439-96-5	
Nickel	**4.1**	mg/kg	0.50	20	07/25/11 07:59	07/28/11 03:39	7440-02-0	
Silver	**70.8**	mg/kg	2.5	100	07/25/11 07:59	07/28/11 15:36	7440-22-4	
Zinc	**384**	mg/kg	5.0	20	07/25/11 07:59	07/28/11 03:39	7440-66-6	
7471 Mercury	Analytical Method: EPA 7471 Preparation Method: EPA 7471							
Mercury	**12.6**	mg/kg	0.60	25	07/25/11 14:10	07/26/11 11:33	7439-97-6	
Dry Weight	Analytical Method: % Moisture							
Percent Moisture	**28.9**	%	0.10	1		07/25/11 00:00		

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QUALITY CONTROL DATA

Project: Black Pine Mine
Pace Project No.: 10163645

QC Batch: MPRP/27469 Analysis Method: CLPICPAES
QC Batch Method: ASA 13-3.5.2.2 Analysis Description: CLPICPAES MET
Associated Lab Samples: 10163645001, 10163645002

METHOD BLANK: 1024549 Matrix: Solid
Associated Lab Samples: 10163645001, 10163645002

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Potassium	mg/kg	<124	124	08/01/11 17:43	

LABORATORY CONTROL SAMPLE & LCSD: 1024550 1024551

Parameter	Units	Spike Conc.	LCS Result	LCSD Result	LCS % Rec	LCSD % Rec	% Rec Limits	RPD	Max RPD	Qualifiers
Potassium	mg/kg	156	177	210	114	135	80-120	17	20	

SAMPLE DUPLICATE: 1024552

Parameter	Units	10163634008 Result	Dup Result	RPD	Max RPD	Qualifiers
Potassium	mg/kg	<116	<125		30	

SAMPLE DUPLICATE: 1024553

Parameter	Units	10163644010 Result	Dup Result	RPD	Max RPD	Qualifiers
Potassium	mg/kg	<123	<125		30	

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QUALITY CONTROL DATA

Project: Black Pine Mine
Pace Project No.: 10163645

QC Batch: ICP/14917 Analysis Method: EPA 9081
QC Batch Method: EPA 9081 Analysis Description: Cation Exchange Capacity
Associated Lab Samples: 10163645001, 10163645002

METHOD BLANK: 853094 Matrix: Solid
Associated Lab Samples: 10163645001, 10163645002

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Cation Exchange Capacity	meq/100g	<1.0	1.0	08/05/11 13:25	

LABORATORY CONTROL SAMPLE: 853095

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Cation Exchange Capacity	meq/100g	53.2	53.1	100	62-138	

SAMPLE DUPLICATE: 853096

Parameter	Units	10163645001 Result	Dup Result	RPD	Max RPD	Qualifiers
Cation Exchange Capacity	meq/100g	14.7	14.1	4	47	

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QUALITY CONTROL DATA

Project: Black Pine Mine
Pace Project No.: 10163645

QC Batch: MPRP/27165 Analysis Method: EPA 6020
QC Batch Method: EPA 3050 Analysis Description: 6020 MET
Associated Lab Samples: 10163645001, 10163645002, 10163645003, 10163645004, 10163645005, 10163645006, 10163645007, 10163645008

METHOD BLANK: 1014843 Matrix: Solid
Associated Lab Samples: 10163645001, 10163645002, 10163645003, 10163645004, 10163645005, 10163645006, 10163645007, 10163645008, 10163645009, 10163645010, 10163645011, 10163645012, 10163645013, 10163645014

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Antimony	mg/kg	<0.50	0.50	07/28/11 01:18	
Arsenic	mg/kg	<0.50	0.50	07/28/11 01:18	
Barium	mg/kg	<0.30	0.30	07/28/11 01:18	
Cadmium	mg/kg	<0.079	0.079	07/28/11 01:18	
Chromium	mg/kg	<0.50	0.50	07/28/11 01:18	
Copper	mg/kg	<0.50	0.50	07/28/11 01:18	
Iron	mg/kg	<49.5	49.5	07/28/11 01:18	
Lead	mg/kg	<0.099	0.099	07/28/11 14:04	
Manganese	mg/kg	<0.50	0.50	07/28/11 01:18	
Nickel	mg/kg	<0.50	0.50	07/28/11 01:18	
Silver	mg/kg	<0.50	0.50	07/28/11 14:04	
Zinc	mg/kg	<5.0	5.0	07/28/11 01:18	

LABORATORY CONTROL SAMPLE: 1014844

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Antimony	mg/kg	19.2	19.1	99	75-125	
Arsenic	mg/kg	19.2	19.2	100	75-125	
Barium	mg/kg	19.2	19.3	101	75-125	
Cadmium	mg/kg	19.2	19.0	99	75-125	
Chromium	mg/kg	19.2	20.1	105	75-125	
Copper	mg/kg	19.2	20.8	108	75-125	
Iron	mg/kg	240	280	117	75-125	
Lead	mg/kg	19.2	22.2	116	75-125	
Manganese	mg/kg	19.2	19.8	103	75-125	
Nickel	mg/kg	19.2	19.8	103	75-125	
Silver	mg/kg	19.2	20.9	109	75-125	
Zinc	mg/kg	19.2	18.8	98	75-125	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 1014845 1014846

Parameter	Units	10163645001 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Antimony	mg/kg	0.63	19.4	18.2	15.4	12.0	76	62	75-125	25	20	D6,M6
Arsenic	mg/kg	6.1	19.4	18.2	26.2	24.1	103	99	75-125	8	20	
Barium	mg/kg	116	19.4	18.2	159	149	220	183	75-125	6	20	M6
Cadmium	mg/kg	0.079	19.4	18.2	19.8	19.0	102	104	75-125	4	20	
Chromium	mg/kg	10.9	19.4	18.2	33.7	31.1	117	111	75-125	8	20	

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QUALITY CONTROL DATA

Project: Black Pine Mine
Pace Project No.: 10163645

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 1014845 1014846

Parameter	Units	10163645001 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Copper	mg/kg	9.6	19.4	18.2	31.1	27.9	111	101	75-125	11	20	
Iron	mg/kg	19300	242	227	20900	22800	660	1540	75-125	9	20	M6
Lead	mg/kg	12.1	19.4	18.2	35.6	33.5	121	118	75-125	6	20	
Manganese	mg/kg	224	19.4	18.2	400	191	903	-183	75-125	71	20	D6,M6
Nickel	mg/kg	6.0	19.4	18.2	27.0	26.1	108	111	75-125	3	20	
Silver	mg/kg	<0.49	19.4	18.2	21.5	20.2	109	110	75-125	6	20	
Zinc	mg/kg	22.8	19.4	18.2	44.4	43.1	111	112	75-125	3	20	
Zinc	mg/kg	22.8	19.4	18.2	44.4	42.0	111	106	75-125	6	20	

MATRIX SPIKE SAMPLE: 1014847

Parameter	Units	10163645011 Result	Spike Conc.	MS Result	MS % Rec	% Rec Limits	Qualifiers
Antimony	mg/kg	10	17	34.4	144	75-125	M6
Arsenic	mg/kg	11.9	17	28.1	95	75-125	
Barium	mg/kg	178	17	78.3	-585	75-125	M6
Cadmium	mg/kg	3.1	17	17.0	82	75-125	
Chromium	mg/kg	6.1	17	18.7	74	75-125	M6
Copper	mg/kg	2360	17	554	-10600	75-125	M6
Iron	mg/kg	5640	213	5010	-296	75-125	M6
Lead	mg/kg	67.7	17	73.2	32	75-125	M6
Manganese	mg/kg	67.2	17	61.6	-33	75-125	M6
Nickel	mg/kg	5.3	17	18.8	80	75-125	
Silver	mg/kg	1.0	17	18.6	103	75-125	
Zinc	mg/kg	108	17	109	8	75-125	M6

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QUALITY CONTROL DATA

Project: Black Pine Mine
Pace Project No.: 10163645

QC Batch: MERP/5651 Analysis Method: EPA 7471
QC Batch Method: EPA 7471 Analysis Description: 7471 Mercury
Associated Lab Samples: 10163645001, 10163645002, 10163645003, 10163645004, 10163645005, 10163645006, 10163645007, 10163645008, 10163645009

METHOD BLANK: 1016612 Matrix: Solid
Associated Lab Samples: 10163645001, 10163645002, 10163645003, 10163645004, 10163645005, 10163645006, 10163645007, 10163645008, 10163645009

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Mercury	mg/kg	<0.018	0.018	08/01/11 13:16	

LABORATORY CONTROL SAMPLE: 1016613

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Mercury	mg/kg	.45	0.46	102	80-120	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 1016614 1016615

Parameter	Units	10163643010 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Mercury	mg/kg	4.1	.62	.65	3.8	3.9	-53	-36	80-120	3	20	M6

MATRIX SPIKE SAMPLE: 1016616

Parameter	Units	10163645009 Result	Spike Conc.	MS Result	MS % Rec	% Rec Limits	Qualifiers
Mercury	mg/kg	0.30	.44	0.47	39	80-120	M1

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QUALITY CONTROL DATA

Project: Black Pine Mine
Pace Project No.: 10163645

QC Batch: MERP/5669 Analysis Method: EPA 7471
QC Batch Method: EPA 7471 Analysis Description: 7471 Mercury
Associated Lab Samples: 10163645010, 10163645011, 10163645012, 10163645013, 10163645014

METHOD BLANK: 1019298 Matrix: Solid
Associated Lab Samples: 10163645010, 10163645011, 10163645012, 10163645013, 10163645014

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Mercury	mg/kg	<0.019	0.019	07/26/11 10:21	

LABORATORY CONTROL SAMPLE: 1019299

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Mercury	mg/kg	.48	0.50	103	80-120	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 1019300 1019301

Parameter	Units	10164099001 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Mercury	mg/kg	ND	.5	.5	0.59	0.58	116	115	80-120	.9	20	

MATRIX SPIKE SAMPLE: 1019302

Parameter	Units	10164264006 Result	Spike Conc.	MS Result	MS % Rec	% Rec Limits	Qualifiers
Mercury	mg/kg	0.040	.68	0.83	115	80-120	

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QUALITY CONTROL DATA

Project: Black Pine Mine
Pace Project No.: 10163645

QC Batch: MPRP/27306 Analysis Method: % Moisture
QC Batch Method: % Moisture Analysis Description: Dry Weight/Percent Moisture
Associated Lab Samples: 10163645001, 10163645002, 10163645003, 10163645004, 10163645005, 10163645006, 10163645007, 10163645008

SAMPLE DUPLICATE: 1019478

Parameter	Units	10163643009 Result	Dup Result	RPD	Max RPD	Qualifiers
Percent Moisture	%	16.2	16.3	1	30	

SAMPLE DUPLICATE: 1019479

Parameter	Units	10163645008 Result	Dup Result	RPD	Max RPD	Qualifiers
Percent Moisture	%	37.2	40.7	9	30	

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QUALITY CONTROL DATA

Project: Black Pine Mine
Pace Project No.: 10163645

QC Batch: MPRP/27307 Analysis Method: % Moisture
QC Batch Method: % Moisture Analysis Description: Dry Weight/Percent Moisture
Associated Lab Samples: 10163645009, 10163645010, 10163645011, 10163645012, 10163645013, 10163645014

SAMPLE DUPLICATE: 1019547

Parameter	Units	10163645009 Result	Dup Result	RPD	Max RPD	Qualifiers
Percent Moisture	%	14.3	15.0	5	30	

SAMPLE DUPLICATE: 1019548

Parameter	Units	10163437014 Result	Dup Result	RPD	Max RPD	Qualifiers
Percent Moisture	%	29.7	28.2	5	30	

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QUALITY CONTROL DATA

Project: Black Pine Mine
Pace Project No.: 10163645

QC Batch: MT/6442 Analysis Method: ASA 33-3.2/EPA 353.2
QC Batch Method: ASA 33-3.2/EPA 353.2 Analysis Description: 353.2 Nitrate + Nitrite
Associated Lab Samples: 10163645001, 10163645002

METHOD BLANK: 1016641 Matrix: Solid
Associated Lab Samples: 10163645001, 10163645002

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Available Nitrate	mg/kg	<5.0	5.0	07/26/11 17:37	

LABORATORY CONTROL SAMPLE: 1016642

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Available Nitrate	mg/kg	25	24.0	96	76-124	

SAMPLE DUPLICATE: 1016643

Parameter	Units	10163246004 Result	Dup Result	RPD	Max RPD	Qualifiers
Available Nitrate	mg/kg	<5.0	<5.0		30	

SAMPLE DUPLICATE: 1016644

Parameter	Units	10163644008 Result	Dup Result	RPD	Max RPD	Qualifiers
Available Nitrate	mg/kg	<5.0	<5.0		30	

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QUALITY CONTROL DATA

Project: Black Pine Mine
Pace Project No.: 10163645

QC Batch: MT/6438 Analysis Method: ASA 29-3.5.2
QC Batch Method: ASA 29-3.5.2 Analysis Description: Organic Matter ASA 29
Associated Lab Samples: 10163645001, 10163645002

METHOD BLANK: 1016290 Matrix: Solid
Associated Lab Samples: 10163645001, 10163645002

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Organic Matter	% (w/w)	<0.10	0.10	07/21/11 16:50	

LABORATORY CONTROL SAMPLE: 1016291

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Organic Matter	% (w/w)	3.1	3.3	107	69-131	

SAMPLE DUPLICATE: 1016293

Parameter	Units	10163634008 Result	Dup Result	RPD	Max RPD	Qualifiers
Organic Matter	% (w/w)	0.13	<0.10		30	

SAMPLE DUPLICATE: 1018103

Parameter	Units	10163246002 Result	Dup Result	RPD	Max RPD	Qualifiers
Organic Matter	% (w/w)	3.3	3.2	2	30	

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QUALITY CONTROL DATA

Project: Black Pine Mine
Pace Project No.: 10163645

QC Batch: MT/6426
QC Batch Method: ASA 10-3.2
Analysis Method: ASA 10-3.2
Analysis Description: ASA 10-3.2 pH saturated paste
Associated Lab Samples: 10163645001, 10163645002

SAMPLE DUPLICATE: 1017424

Parameter	Units	10163246004 Result	Dup Result	RPD	Max RPD	Qualifiers
pH, Saturated Paste	Std. Units	7.0	6.9	.7	20	

SAMPLE DUPLICATE: 1017425

Parameter	Units	10163645001 Result	Dup Result	RPD	Max RPD	Qualifiers
pH, Saturated Paste	Std. Units	6.9	6.7	2	20	

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QUALITY CONTROL DATA

Project: Black Pine Mine
Pace Project No.: 10163645

QC Batch: MT/6443 Analysis Method: ASA 24-5.4/SM4500
QC Batch Method: ASA 24-5.4/SM4500 Analysis Description: SM4500P-E, Total Phosphorus
Associated Lab Samples: 10163645001, 10163645002

METHOD BLANK: 1016645 Matrix: Solid
Associated Lab Samples: 10163645001, 10163645002

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Available Phosphorus	mg/kg	<1.0	1.0	07/25/11 14:30	

LABORATORY CONTROL SAMPLE: 1016646

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Available Phosphorus	mg/kg	10	8.0	80	56-144	

SAMPLE DUPLICATE: 1016647

Parameter	Units	10163246004 Result	Dup Result	RPD	Max RPD	Qualifiers
Available Phosphorus	mg/kg	2.8	3.1	9	30	

SAMPLE DUPLICATE: 1016648

Parameter	Units	10163644006 Result	Dup Result	RPD	Max RPD	Qualifiers
Available Phosphorus	mg/kg	1.4	1.4	3	30	

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QUALITY CONTROL DATA

Project: Black Pine Mine
Pace Project No.: 10163645

QC Batch: MT/6498 Analysis Method: Modified Sobek 3.2
QC Batch Method: Modified Sobek 3.2 Analysis Description: Sobek Acid Base Potential
Associated Lab Samples: 10163645001, 10163645002, 10163645003, 10163645007, 10163645010, 10163645013

METHOD BLANK: 1020554 Matrix: Solid
Associated Lab Samples: 10163645001, 10163645002, 10163645003, 10163645007, 10163645010, 10163645013

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Neutralization Potential	tons/1000	<0.5	0.50	08/02/11 00:00	

SAMPLE DUPLICATE: 1020555

Parameter	Units	10163645001 Result	Dup Result	RPD	Max RPD	Qualifiers
Neutralization Potential	tons/1000	2.0	1.7			

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QUALITY CONTROL DATA

Project: Black Pine Mine
Pace Project No.: 10163645

QC Batch: MT/6489 Analysis Method: Modified Sobek 3.2
QC Batch Method: Modified Sobek 3.2 Analysis Description: Sobek Extractable Sulfur
Associated Lab Samples: 10163645001, 10163645002, 10163645003, 10163645007, 10163645010, 10163645013

METHOD BLANK: 1019980 Matrix: Solid
Associated Lab Samples: 10163645001, 10163645002, 10163645003, 10163645007, 10163645010, 10163645013

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Total Sulfur	% (w/w)	<0.050	0.050	08/09/11 10:56	

SAMPLE DUPLICATE: 1019982

Parameter	Units	10163645001 Result	Dup Result	RPD	Max RPD	Qualifiers
Total Sulfur	% (w/w)	<0.050	<0.050			

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QUALITY CONTROL DATA

Project: Black Pine Mine
Pace Project No.: 10163645

QC Batch: MT/6544 Analysis Method: Modified Sobek 3.2
QC Batch Method: Modified Sobek 3.2 Analysis Description: Sobek SMP Buffer pH
Associated Lab Samples: 10163645001, 10163645002, 10163645003, 10163645007, 10163645010, 10163645013

SAMPLE DUPLICATE: 1022821

Parameter	Units	10163645001 Result	Dup Result	RPD	Max RPD	Qualifiers
SMP Buffer pH	Std. Units	6.8	6.9	1	20	

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QUALITY CONTROL DATA

Project: Black Pine Mine
Pace Project No.: 10163645

QC Batch: MT/6547 Analysis Method: ASA 10-3.3
QC Batch Method: ASA 10-3.3 Analysis Description: ASA 10-3.3 Specific Conductance
Associated Lab Samples: 10163645001, 10163645002

METHOD BLANK: 1022940 Matrix: Water
Associated Lab Samples: 10163645001, 10163645002

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Sp.Conductance Saturated Paste	mmhos/cm	<0.010	0.010	07/27/11 12:56	

LABORATORY CONTROL SAMPLE: 1022941

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Sp.Conductance Saturated Paste	mmhos/cm	.85	0.80	94	53-147	

SAMPLE DUPLICATE: 1022942

Parameter	Units	10163246004 Result	Dup Result	RPD	Max RPD	Qualifiers
Sp.Conductance Saturated Paste	mmhos/cm	0.091	0.088	3	20	

SAMPLE DUPLICATE: 1022943

Parameter	Units	10163645001 Result	Dup Result	RPD	Max RPD	Qualifiers
Sp.Conductance Saturated Paste	mmhos/cm	0.20	0.14	33	20	D6

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QUALIFIERS

Project: Black Pine Mine
Pace Project No.: 10163645

DEFINITIONS

DF - Dilution Factor, if reported, represents the factor applied to the reported data due to changes in sample preparation, dilution of the sample aliquot, or moisture content.

ND - Not Detected at or above adjusted reporting limit.

J - Estimated concentration above the adjusted method detection limit and below the adjusted reporting limit.

MDL - Adjusted Method Detection Limit.

S - Surrogate

1,2-Diphenylhydrazine (8270 listed analyte) decomposes to Azobenzene.

Consistent with EPA guidelines, unrounded data are displayed and have been used to calculate % recovery and RPD values.

LCS(D) - Laboratory Control Sample (Duplicate)

MS(D) - Matrix Spike (Duplicate)

DUP - Sample Duplicate

RPD - Relative Percent Difference

NC - Not Calculable.

SG - Silica Gel - Clean-Up

U - Indicates the compound was analyzed for, but not detected.

N-Nitrosodiphenylamine decomposes and cannot be separated from Diphenylamine using Method 8270. The result reported for each analyte is a combined concentration.

LABORATORIES

PASI-K	Pace Analytical Services - Kansas City
PASI-M	Pace Analytical Services - Minneapolis
PASI-MT	Pace Analytical Services - Montana

ANALYTE QUALIFIERS

D6	The relative percent difference (RPD) between the sample and sample duplicate exceeded laboratory control limits.
M1	Matrix spike recovery exceeded QC limits. Batch accepted based on laboratory control sample (LCS) recovery.
M6	Matrix spike and Matrix spike duplicate recovery not evaluated against control limits due to sample dilution.

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QUALITY CONTROL DATA CROSS REFERENCE TABLE

Project: Black Pine Mine
Pace Project No.: 10163645

Lab ID	Sample ID	QC Batch Method	QC Batch	Analytical Method	Analytical Batch
10163645001	**BP-CML-TS-11-01**	ASA 13-3.5.2.2	MPRP/27469	CLPICPAES	ICP/11638
10163645002	**BP-CML-TS-11-08**	ASA 13-3.5.2.2	MPRP/27469	CLPICPAES	ICP/11638
10163645001	**BP-CML-TS-11-01**	EPA 9081	ICP/14917	EPA 9081	ICP/13002
10163645002	**BP-CML-TS-11-08**	EPA 9081	ICP/14917	EPA 9081	ICP/13002
10163645001	**BP-CML-TS-11-01**	EPA 3050	MPRP/27165	EPA 6020	ICPM/11110
10163645002	**BP-CML-TS-11-08**	EPA 3050	MPRP/27165	EPA 6020	ICPM/11110
10163645003	**BP-CML-TS-10-00**	EPA 3050	MPRP/27165	EPA 6020	ICPM/11110
10163645004	**BP-CML-TS-10-02**	EPA 3050	MPRP/27165	EPA 6020	ICPM/11110
10163645005	**BP-CML-SS-10-06**	EPA 3050	MPRP/27165	EPA 6020	ICPM/11110
10163645006	**BP-CML-TS-01-00**	EPA 3050	MPRP/27165	EPA 6020	ICPM/11110
10163645007	**BP-CML-TS-01-02**	EPA 3050	MPRP/27165	EPA 6020	ICPM/11110
10163645008	**BP-CML-SS-01-06**	EPA 3050	MPRP/27165	EPA 6020	ICPM/11110
10163645009	**BP-CML-TS-02-00**	EPA 3050	MPRP/27165	EPA 6020	ICPM/11110
10163645010	**BP-CML-TS-02-02**	EPA 3050	MPRP/27165	EPA 6020	ICPM/11110
10163645011	**BP-CML-SS-02-06**	EPA 3050	MPRP/27165	EPA 6020	ICPM/11110
10163645012	**BP-CML-TS-03-00**	EPA 3050	MPRP/27165	EPA 6020	ICPM/11110
10163645013	**BP-CML-TS-03-02**	EPA 3050	MPRP/27165	EPA 6020	ICPM/11110
10163645014	**BP-CML-SS-03-06**	EPA 3050	MPRP/27165	EPA 6020	ICPM/11110
10163645001	**BP-CML-TS-11-01**	EPA 7471	MERP/5651	EPA 7471	MERC/6471
10163645002	**BP-CML-TS-11-08**	EPA 7471	MERP/5651	EPA 7471	MERC/6471
10163645003	**BP-CML-TS-10-00**	EPA 7471	MERP/5651	EPA 7471	MERC/6471
10163645004	**BP-CML-TS-10-02**	EPA 7471	MERP/5651	EPA 7471	MERC/6471
10163645005	**BP-CML-SS-10-06**	EPA 7471	MERP/5651	EPA 7471	MERC/6471
10163645006	**BP-CML-TS-01-00**	EPA 7471	MERP/5651	EPA 7471	MERC/6471
10163645007	**BP-CML-TS-01-02**	EPA 7471	MERP/5651	EPA 7471	MERC/6471
10163645008	**BP-CML-SS-01-06**	EPA 7471	MERP/5651	EPA 7471	MERC/6471
10163645009	**BP-CML-TS-02-00**	EPA 7471	MERP/5651	EPA 7471	MERC/6471
10163645010	**BP-CML-TS-02-02**	EPA 7471	MERP/5669	EPA 7471	MERC/6473
10163645011	**BP-CML-SS-02-06**	EPA 7471	MERP/5669	EPA 7471	MERC/6473
10163645012	**BP-CML-TS-03-00**	EPA 7471	MERP/5669	EPA 7471	MERC/6473
10163645013	**BP-CML-TS-03-02**	EPA 7471	MERP/5669	EPA 7471	MERC/6473
10163645014	**BP-CML-SS-03-06**	EPA 7471	MERP/5669	EPA 7471	MERC/6473
10163645001	**BP-CML-TS-11-01**	% Moisture	MPRP/27306		
10163645002	**BP-CML-TS-11-08**	% Moisture	MPRP/27306		
10163645003	**BP-CML-TS-10-00**	% Moisture	MPRP/27306		
10163645004	**BP-CML-TS-10-02**	% Moisture	MPRP/27306		
10163645005	**BP-CML-SS-10-06**	% Moisture	MPRP/27306		
10163645006	**BP-CML-TS-01-00**	% Moisture	MPRP/27306		
10163645007	**BP-CML-TS-01-02**	% Moisture	MPRP/27306		
10163645008	**BP-CML-SS-01-06**	% Moisture	MPRP/27306		
10163645009	**BP-CML-TS-02-00**	% Moisture	MPRP/27307		
10163645010	**BP-CML-TS-02-02**	% Moisture	MPRP/27307		
10163645011	**BP-CML-SS-02-06**	% Moisture	MPRP/27307		
10163645012	**BP-CML-TS-03-00**	% Moisture	MPRP/27307		
10163645013	**BP-CML-TS-03-02**	% Moisture	MPRP/27307		
10163645014	**BP-CML-SS-03-06**	% Moisture	MPRP/27307		

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Billings, MT 591014549
(406)254-7226

QUALITY CONTROL DATA CROSS REFERENCE TABLE

Project: Black Pine Mine
Pace Project No.: 10163645

Lab ID	Sample ID	QC Batch Method	QC Batch	Analytical Method	Analytical Batch
10163645001	**BP-CML-TS-11-01**	ASA 33-3.2/EPA 353.2	MT/6442		
10163645002	**BP-CML-TS-11-08**	ASA 33-3.2/EPA 353.2	MT/6442		
10163645001	**BP-CML-TS-11-01**	ASTM D421	MT/6412		
10163645002	**BP-CML-TS-11-08**	ASTM D421	MT/6412		
10163645001	**BP-CML-TS-11-01**	ASA 29-3.5.2	MT/6438		
10163645002	**BP-CML-TS-11-08**	ASA 29-3.5.2	MT/6438		
10163645001	**BP-CML-TS-11-01**	ASA 10-3.2	MT/6426		
10163645002	**BP-CML-TS-11-08**	ASA 10-3.2	MT/6426		
10163645001	**BP-CML-TS-11-01**	ASA 24-5.4/SM4500	MT/6443		
10163645002	**BP-CML-TS-11-08**	ASA 24-5.4/SM4500	MT/6443		
10163645001	**BP-CML-TS-11-01**	Modified Sobek 3.2	MT/6498		
10163645002	**BP-CML-TS-11-08**	Modified Sobek 3.2	MT/6498		
10163645003	**BP-CML-TS-10-00**	Modified Sobek 3.2	MT/6498		
10163645007	**BP-CML-TS-01-02**	Modified Sobek 3.2	MT/6498		
10163645010	**BP-CML-TS-02-02**	Modified Sobek 3.2	MT/6498		
10163645013	**BP-CML-TS-03-02**	Modified Sobek 3.2	MT/6498		
10163645001	**BP-CML-TS-11-01**	Modified Sobek 3.2	MT/6489		
10163645002	**BP-CML-TS-11-08**	Modified Sobek 3.2	MT/6489		
10163645003	**BP-CML-TS-10-00**	Modified Sobek 3.2	MT/6489		
10163645007	**BP-CML-TS-01-02**	Modified Sobek 3.2	MT/6489		
10163645010	**BP-CML-TS-02-02**	Modified Sobek 3.2	MT/6489		
10163645013	**BP-CML-TS-03-02**	Modified Sobek 3.2	MT/6489		
10163645001	**BP-CML-TS-11-01**	Modified Sobek 3.2	MT/6502		
10163645002	**BP-CML-TS-11-08**	Modified Sobek 3.2	MT/6502		
10163645003	**BP-CML-TS-10-00**	Modified Sobek 3.2	MT/6502		
10163645007	**BP-CML-TS-01-02**	Modified Sobek 3.2	MT/6502		
10163645010	**BP-CML-TS-02-02**	Modified Sobek 3.2	MT/6502		
10163645013	**BP-CML-TS-03-02**	Modified Sobek 3.2	MT/6502		
10163645001	**BP-CML-TS-11-01**	Modified Sobek 3.2	MT/6544		
10163645002	**BP-CML-TS-11-08**	Modified Sobek 3.2	MT/6544		
10163645003	**BP-CML-TS-10-00**	Modified Sobek 3.2	MT/6544		
10163645007	**BP-CML-TS-01-02**	Modified Sobek 3.2	MT/6544		
10163645010	**BP-CML-TS-02-02**	Modified Sobek 3.2	MT/6544		
10163645013	**BP-CML-TS-03-02**	Modified Sobek 3.2	MT/6544		
10163645001	**BP-CML-TS-11-01**	ASA 10-3.3	MT/6547		
10163645002	**BP-CML-TS-11-08**	ASA 10-3.3	MT/6547		

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CHAIN-OF-CUSTODY / Analytical Request Document

The Chain-of-Custody is a LEGAL DOCUMENT. All relevant fields must be completed accurately.

Page: 1 of 2

1429908

Section A Required Client Information:	Section B Required Project Information:	Section C Invoice Information:
Company: Herrera	Report To: Kevin Houck	Attention:
Address:	Copy To:	Company Name: DEQ
		Address:
Email To:	Purchase Order No.:	Pace Quote Reference:
Phone: Fax:	Project Name: Black Pine Mine	Pace Project Manager:
Requested Due Date/TAT:	Project Number:	Pace Profile #:

REGULATORY AGENCY

☐ NPDES ☐ GROUND WATER ☐ DRINKING WATER

☐ UST ☐ RCRA ☐ OTHER _____

Site Location STATE: _____

Section D Required Client Information

SAMPLE ID
(A-Z, 0-9 / ,-)
Sample IDs MUST BE UNIQUE

Matrix Codes — MATRIX / CODE
Drinking Water DW
Water WT
Waste Water WW
Product P
Soil/Solid SL
Oil OL
Wipe WP
Air AR
Tissue TS
Other OT

Requested Analysis Filtered (Y/N)

10163645

ITEM #	SAMPLE ID	MATRIX CODE (see valid codes to left)	SAMPLE TYPE (G=GRAB C=COMP)	COLLECTED COMPOSITE START DATE	COMPOSITE START TIME	COMPOSITE END/GRAB DATE	COMPOSITE END/GRAB TIME	SAMPLE TEMP AT COLLECTION	# OF CONTAINERS	Preservatives: Unpreserved	H_2SO_4	HNO_3	HCl	NaOH	$Na_2S_2O_3$	Methanol	Other	Analysis Test Y/N	Tot Rec. Met	Agriculture	ABA	Moisture Content	Residual Chlorine (Y/N)	Pace Project No./ Lab I.D.
1	BP-CML-TS-11-01	SL	G			7/15/11	0735		2	X									X	X				001
2	BP-CML-TS-11-08	SL	G			7/15/11	0740		2	X									X	X				002
3	BP-CML-TS-10-00	"	"			"	0850		2	X									X		X	X		003
4	BP-CML-TS-10-02	"	"			"	0852		1	X									X			X		004
5	BP-CML-TS-10-06	↓	↓			↓	0854		1	X									X					005
6	BP-CML-TS-01-00	SL	G			7/15/11	0940		1	X									X			X		006
7	BP-CML-TS-01-02	"	"			"	0942		2	X									X		X	X		007
8	BP-CML-SS-01-06	↓	↓			↓	0945		1	X									X					008
9	BP-CML-TS-02-00	SL	G			7/15/11	1010		1	X									X			X		009
10	BP-CML-TS-02-02	"	"			"	1015		2	X									X		X	X		010
11	BP-CML-SS-02-06	↓	↓			↓	1017		1	X									X					011
12	BP-CML-TS-03-00	SL	G			7/15/11	1040		1	X									X			X		012

Agriculture = pH, CEC, cond, nitrogen, phosphorus, potassium, Organic matter, lime w/ fert. rec.

ADDITIONAL COMMENTS	RELINQUISHED BY / AFFILIATION	DATE	TIME	ACCEPTED BY / AFFILIATION	DATE	TIME	SAMPLE CONDITIONS			
Tot Recover. met = Sb, As, Ba, Cd, Cr, Co, Cu, Fe, Pb, Mn, Hg, Ni, Zn	Fed Ex (E) pickup 7/16	7/16/11	11:30	Pace	7/16/11	1130	3°C	Y	Y	Y

ORIGINAL

SAMPLER NAME AND SIGNATURE

PRINT Name of SAMPLER: ALEX SVENDSEN

SIGNATURE of SAMPLER: _____ DATE Signed (MM/DD/YY): 7/15/11

Temp in °C | Received on Ice (Y/N) | Custody Sealed Cooler (Y/N) | Samples Intact (Y/N)

*Important Note: By signing this form you are accepting Pace's NET 30 day payment terms and agreeing to late charges of 1.5% per month for any invoices not paid within 30 days.

F-ALL-Q-020rev.07, 15-May-2007

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CHAIN-OF-CUSTODY / Analytical Request Document

The Chain-of-Custody is a LEGAL DOCUMENT. All relevant fields must be completed accurately.

1429911

Section A Required Client Information:	Section B Required Project Information:	Section C Invoice Information:
Company: Herrera	Report To: Kevin Houck	Attention:
Address:	Copy To:	Company Name: DEQ
		Address:
Email To:	Purchase Order No.:	Pace Quote Reference:
Phone: Fax:	Project Name: Black Pine Mine	Pace Project Manager:
Requested Due Date/TAT:	Project Number:	Pace Profile #:

REGULATORY AGENCY: ☐ NPDES ☐ GROUND WATER ☐ DRINKING WATER ☐ UST ☐ RCRA ☐ OTHER

Site Location STATE:

Requested Analysis Filtered (Y/N)

ITEM #	Section D Required Client Information: SAMPLE ID (A-Z, 0-9 / ,-) Sample IDs MUST BE UNIQUE	Matrix Codes MATRIX / CODE: Drinking Water DW, Water WT, Waste Water WW, Product P, Soil/Solid SL, Oil OL, Wipe WP, Air AR, Tissue TS, Other OT	MATRIX CODE (see valid codes to left)	SAMPLE TYPE (G=GRAB C=COMP)	COLLECTED: COMPOSITE START DATE	COMPOSITE START TIME	COMPOSITE END/GRAB DATE	COMPOSITE END/GRAB TIME	SAMPLE TEMP AT COLLECTION	# OF CONTAINERS	Preservatives: Unpreserved	H_2SO_4	HNO_3	HCl	NaOH	$Na_2S_2O_3$	Methanol	Other	Y/N	Analysis Test ↓	Tot. Rec. Met	RBA	Moisture content	Residual Chlorine (Y/N)	Pace Project No./ Lab I.D.
1	BP-CML-TS-03-02		SL	G		7/15/11		1043		2	X									X	X	X			013
2	BP-CML-SS-03-06		SL	G			7/15/11	1045		1	X									X					014
3																									
4																									
5																									
6																									
7																									
8																									
9																									
10																									
11																									
12																									

101163645

ADDITIONAL COMMENTS	RELINQUISHED BY / AFFILIATION	DATE	TIME	ACCEPTED BY / AFFILIATION	DATE	TIME	SAMPLE CONDITIONS			
Tot recoverable metals = Sb, As, Ba, Cd, Cr, Co, Cu, Fe, Pb, Mn, Hg, Ni, Zn	FedEx Ground Pickup	7/16/11	1130	Pace	7/16/11	1130	3°C	Y	Y	Y

ORIGINAL

SAMPLER NAME AND SIGNATURE

PRINT Name of SAMPLER: ALEX SVENDSEN

SIGNATURE of SAMPLER: DATE Signed (MM/DD/YY): 7/15/11

Temp in °C | Received on Ice (Y/N) | Custody Sealed Cooler (Y/N) | Samples Intact (Y/N)

*Important Note: By signing this form you are accepting Pace's NET 30 day payment terms and agreeing to late charges of 1.5% per month for any invoices not paid within 30 days.

Sample Condition Upon Receipt

Pace Analytical

Client Name: MDEQ - BLACK PINE Project # 10163645

Courier: [X] Fed Ex [ ] UPS [ ] USPS [ ] Client [ ] Commercial [ ] Pace Other _____

Tracking #: 8762 4930 8789

Custody Seal on Cooler/Box Present: [X] yes [ ] no Seals intact: [X] yes [ ] no

Packing Material: [ ] Bubble Wrap [X] Bubble Bags [ ] None [ ] Other _____ Temp Blank: Yes [X] No [ ]

Thermometer Used 383045 or 135 Type of Ice: (Wet) Blue None [X] Samples on ice, cooling process has begun

Cooler Temperature 3.0° Biological Tissue is Frozen: Yes No

Temp should be above freezing to 6°C

Date and Initials of person examining contents: MCT 7/17/11

Comments:

Chain of Custody Present:	[X] Yes	[ ] No	[ ] N/A
Chain of Custody Filled Out:	[X] Yes	[ ] No	[ ] N/A
Chain of Custody Relinquished:	[X] Yes	[ ] No	[ ] N/A
Sampler Name & Signature on COC:	[X] Yes	[ ] No	[ ] N/A
Samples Arrived within Hold Time:	[X] Yes	[ ] No	[ ] N/A
Short Hold Time Analysis (<72hr):	[ ] Yes	[X] No	[ ] N/A
Rush Turn Around Time Requested:	[ ] Yes	[X] No	[ ] N/A
Sufficient Volume:	[X] Yes	[ ] No	[ ] N/A
Correct Containers Used:	[X] Yes	[ ] No	[ ] N/A
-Pace Containers Used:	[X] Yes	[ ] No	[ ] N/A
Containers Intact:	[X] Yes	[ ] No	[ ] N/A
Filtered volume received for Dissolved tests	[ ] Yes	[ ] No	[X] N/A
Sample Labels match COC:	[X] Yes	[ ] No	[ ] N/A
-Includes date/time/ID/Analysis Matrix: SOIL			
All containers needing acid/base preservation have been checked. Noncompliance are noted in 13.	[ ] Yes	[ ] No	[X] N/A
All containers needing preservation are found to be in compliance with EPA recommendation.	[ ] Yes	[ ] No	[X] N/A
Exceptions: VOA,Coliform, TOC, Oil and Grease, WI-DRO (water)	[ ] Yes	[X] No	
Samples checked for dechlorination:	[ ] Yes	[ ] No	[X] N/A
Headspace in VOA Vials (>6mm):	[ ] Yes	[ ] No	[X] N/A
Trip Blank Present:	[ ] Yes	[ ] No	[X] N/A
Trip Blank Custody Seals Present	[ ] Yes	[ ] No	[X] N/A
Pace Trip Blank Lot # (if purchased):			

1.
2.
3.
4.
5.
6.
7.
8.
9.
10.
11.
12.
13. [ ] HNO3 [ ] H2SO4 [ ] NaOH [ ] HCl Samp #

Initial when completed | Lot # of added preservative

14.
15.
16.

Client Notification/ Resolution: Field Data Required? Y / N

Person Contacted: _____ Date/Time: _____

Comments/ Resolution: _____

Project Manager Review: [signature] **Date:** 7/17/11

Note: Whenever there is a discrepancy affecting North Carolina compliance samples, a copy of this form will be sent to the North Carolina DEHNR Certification Office (i.e out of hold, incorrect preservative, out of temp, incorrect containers)

Pace Analytical Services, Inc.
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(406)254-7226

September 09, 2011

Kevin Houck
Herrera Environmental Consultants
101 East Broadway, Suite 610
Missoula, MT 59802

RE: Project: Black Pine Mine (06)
Pace Project No.: 10166973

Dear Kevin Houck:
Enclosed are the analytical results for sample(s) received by the laboratory on August 18, 2011. The results relate only to the samples included in this report.

If you have any questions concerning this report, please feel free to contact me.

Sincerely,

Sally Heinje

sally.heinje@pacelabs.com
Project Manager

Enclosures

cc: Devin Clary, Montana Dept. of Environmental Quality
Mark Donner, Trihydro

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CERTIFICATIONS

Project: Black Pine Mine (06)
Pace Project No.: 10166973

Minnesota Certification IDs

1700 Elm Street SE Suite 200, Minneapolis, MN 55414
A2LA Certification #: 2926.01
Alaska Certification #: UST-078
Alaska Certification #MN00064
Arizona Certification #: AZ-0014
Arkansas Certification #: 88-0680
California Certification #: 01155CA
EPA Region 8 Certification #: Pace
Florida/NELAP Certification #: E87605
Georgia Certification #: 959
Idaho Certification #: MN00064
Illinois Certification #: 200011
Iowa Certification #: 368
Kansas Certification #: E-10167
Louisiana Certification #: 03086
Louisiana Certification #: LA080009
Maine Certification #: 2007029
Maryland Certification #: 322
Michigan DEQ Certification #: 9909
Minnesota Certification #: 027-053-137
Mississippi Certification #: Pace
Montana Certification #: MT CERT0092
Nebraska Certification #: Pace
Nevada Certification #: MN_00064
New Jersey Certification #: MN-002
New Mexico Certification #: Pace
New York Certification #: 11647
North Carolina Certification #: 530
North Dakota Certification #: R-036
North Dakota Certification #: R-036A
Ohio VAP Certification #: CL101
Oklahoma Certification #: D9921
Oklahoma Certification #: 9507
Oregon Certification #: MN200001
Pennsylvania Certification #: 68-00563
Puerto Rico Certification
Tennessee Certification #: 02818
Texas Certification #: T104704192
Washington Certification #: C754
Wisconsin Certification #: 999407970

Montana Certification IDs

602 South 25th Street, Billings, MT 59101
EPA Region 8 Certification #: 8TMS-Q
Idaho Certification #: MT00012
Montana Certification #: MT CERT0040
NVLAP Certification #: 101292-0
Minnesota Dept of Health Certification #: 030-999-442

Kansas Certification IDs

9608 Loiret Boulevard, Lenexa, KS 66219
A2LA Certification #: 2456.01
Arkansas Certification #: 05-008-0
Illinois Certification #: 001191
Iowa Certification #: 118
Kansas/NELAP Certification #: E-10116
Louisiana Certification #: 03055
Nevada Certification #: KS000212008A
Oklahoma Certification #: 9205/9935
Texas Certification #: T104704407-08-TX
Utah Certification #: 9135995665

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SAMPLE SUMMARY

Project: Black Pine Mine (06)
Pace Project No.: 10166973

Lab ID	Sample ID	Matrix	Date Collected	Date Received
10166973001	**BP-RY-06-00**	Solid	08/16/11 11:10	08/18/11 09:10
10166973002	**BP-RY-06-04**	Solid	08/16/11 11:20	08/18/11 09:10
10166973003	**BP-RY-07-00**	Solid	08/17/11 08:15	08/18/11 09:10
10166973004	**BP-RY-07-10**	Solid	08/17/11 08:50	08/18/11 09:10
10166973005	**BP-RY-08-00**	Solid	08/17/11 12:10	08/18/11 09:10
10166973006	**BP-CML-RCRA-01**	Solid	08/17/11 10:00	08/18/11 09:10
10166973007	**BP-CML-RCRA-02**	Solid	08/17/11 10:45	08/18/11 09:10
10166973008	**BP-CML-RCRA-03**	Solid	08/17/11 11:04	08/18/11 09:10
10166973009	**BP-CML-RCRA-04**	Solid	08/17/11 11:34	08/18/11 09:10

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SAMPLE ANALYTE COUNT

Project: Black Pine Mine (06)
Pace Project No.: 10166973

Lab ID	Sample ID	Method	Analysts	Analytes Reported	Laboratory
10166973001	**BP-RY-06-00**	EPA 6020	RJS	12	PASI-M
		EPA 7471	TEM	1	PASI-M
		% Moisture	JDL	1	PASI-M
10166973002	**BP-RY-06-04**	EPA 6020	RJS	12	PASI-M
		EPA 7471	TEM	1	PASI-M
		% Moisture	JDL	1	PASI-M
10166973003	**BP-RY-07-00**	EPA 6020	RJS	12	PASI-M
		EPA 7471	TEM	1	PASI-M
		% Moisture	JDL	1	PASI-M
10166973004	**BP-RY-07-10**	EPA 6020	RJS	12	PASI-M
		EPA 7471	TEM	1	PASI-M
		% Moisture	JDL	1	PASI-M
10166973005	**BP-RY-08-00**	CLPICPAES	IP	1	PASI-M
		EPA 9081	JGP	1	PASI-K
		EPA 6020	RJS	12	PASI-M
		EPA 7471	TEM	1	PASI-M
		% Moisture	JDL	1	PASI-M
		ASA 33-3.2/EPA 353.2	CAC	1	PASI-MT
		ASTM D421	CAC	1	PASI-MT
		ASA 29-3.5.2	CAC	1	PASI-MT
		ASA 10-3.2	SR1	1	PASI-MT
		ASA 24-5.4/SM4500	SA1	1	PASI-MT
		Modified Sobek 3.2	CAC	1	PASI-MT
		Modified Sobek 3.2	CAC	5	PASI-MT
		Modified Sobek 3.2	CAC	4	PASI-MT
		Modified Sobek 3.2	CAC	1	PASI-MT
		ASA 10-3.3	SR1	1	PASI-MT
10166973006	**BP-CML-RCRA-01**	EPA 6020	RJS	7	PASI-M
		EPA 7471	TEM	1	PASI-M
		% Moisture	JDL	1	PASI-M
10166973007	**BP-CML-RCRA-02**	EPA 6020	RJS	7	PASI-M
		EPA 7471	TEM	1	PASI-M
		% Moisture	JDL	1	PASI-M
10166973008	**BP-CML-RCRA-03**	EPA 6020	RJS	7	PASI-M
		EPA 7471	TEM	1	PASI-M
		% Moisture	JDL	1	PASI-M
10166973009	**BP-CML-RCRA-04**	EPA 6020	RJS	7	PASI-M

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SAMPLE ANALYTE COUNT

Project: Black Pine Mine (06)
Pace Project No.: 10166973

Lab ID	Sample ID	Method	Analysts	Analytes Reported	Laboratory
		EPA 7471	TEM	1	PASI-M
		% Moisture	JDL	1	PASI-M

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PROJECT NARRATIVE

Project: Black Pine Mine (06)
Pace Project No.: 10166973

Method: **CLPICPAES**
Description: 6010 MET ICP, MDEQ Potassium
Client: Montana Dept. of Environmental Quality
Date: September 09, 2011

General Information:
1 sample was analyzed for CLPICPAES. All samples were received in acceptable condition with any exceptions noted below.

L2: Analyte recovery in the laboratory control sample (LCS) was below QC limits. Results may be biased low.
- BP-RY-08-00 (Lab ID: 10166973005)

Hold Time:
The samples were analyzed within the method required hold times with any exceptions noted below.

Sample Preparation:
The samples were prepared in accordance with ASA 13-3.5.2.2 with any exceptions noted below.

Initial Calibrations (including MS Tune as applicable):
All criteria were within method requirements with any exceptions noted below.

Continuing Calibration:
All criteria were within method requirements with any exceptions noted below.

Method Blank:
All analytes were below the report limit in the method blank with any exceptions noted below.

Laboratory Control Spike:
All laboratory control spike compounds were within QC limits with any exceptions noted below.

QC Batch: MPRP/28018

L0: Analyte recovery in the laboratory control sample (LCS) was outside QC limits.
- LCS (Lab ID: 1041722)
  - Potassium

Matrix Spikes:
All percent recoveries and relative percent differences (RPDs) were within acceptance criteria with any exceptions noted below.

Duplicate Sample:
All duplicate sample results were within method acceptance criteria with any exceptions noted below.

Additional Comments:

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PROJECT NARRATIVE

Project: Black Pine Mine (06)
Pace Project No.: 10166973

Method: **EPA 9081**
Description: Cation Exchange Capacity
Client: Montana Dept. of Environmental Quality
Date: September 09, 2011

General Information:
1 sample was analyzed for EPA 9081. All samples were received in acceptable condition with any exceptions noted below.

Hold Time:
The samples were analyzed within the method required hold times with any exceptions noted below.

Initial Calibrations (including MS Tune as applicable):
All criteria were within method requirements with any exceptions noted below.

Continuing Calibration:
All criteria were within method requirements with any exceptions noted below.

Method Blank:
All analytes were below the report limit in the method blank with any exceptions noted below.

Laboratory Control Spike:
All laboratory control spike compounds were within QC limits with any exceptions noted below.

Matrix Spikes:
All percent recoveries and relative percent differences (RPDs) were within acceptance criteria with any exceptions noted below.

Duplicate Sample:
All duplicate sample results were within method acceptance criteria with any exceptions noted below.

Additional Comments:

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(406)254-7226

PROJECT NARRATIVE

Project: Black Pine Mine (06)
Pace Project No.: 10166973

Method: **EPA 6020**
Description: 6020 MET ICPMS
Client: Montana Dept. of Environmental Quality
Date: September 09, 2011

General Information:
9 samples were analyzed for EPA 6020. All samples were received in acceptable condition with any exceptions noted below.

Hold Time:
The samples were analyzed within the method required hold times with any exceptions noted below.

Sample Preparation:
The samples were prepared in accordance with EPA 3050 with any exceptions noted below.

Initial Calibrations (including MS Tune as applicable):
All criteria were within method requirements with any exceptions noted below.

Continuing Calibration:
All criteria were within method requirements with any exceptions noted below.

QC Batch: MPRP/27890

CH: The continuing calibration for this compound is outside of Pace Analytical acceptance limits. The results may be biased high.

- BLANK (Lab ID: 1037976)
  - Silver
- BP-RY-06-04 (Lab ID: 10166973002)
  - Silver
- BP-RY-07-00 (Lab ID: 10166973003)
  - Silver
- BP-RY-07-10 (Lab ID: 10166973004)
  - Silver

Internal Standards:
All internal standards were within QC limits with any exceptions noted below.

Method Blank:
All analytes were below the report limit in the method blank with any exceptions noted below.

Laboratory Control Spike:
All laboratory control spike compounds were within QC limits with any exceptions noted below.

Matrix Spikes:
All percent recoveries and relative percent differences (RPDs) were within acceptance criteria with any exceptions noted below.

QC Batch: MPRP/27890

A matrix spike and matrix spike duplicate (MS/MSD) were performed on the following sample(s): 10166898013,10166973004

M6: Matrix spike and Matrix spike duplicate recovery not evaluated against control limits due to sample dilution.

- MS (Lab ID: 1037978)
  - Antimony
  - Barium

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PROJECT NARRATIVE

Project: Black Pine Mine (06)
Pace Project No.: 10166973

Method: **EPA 6020**
Description: 6020 MET ICPMS
Client: Montana Dept. of Environmental Quality
Date: September 09, 2011

QC Batch: MPRP/27890

A matrix spike and matrix spike duplicate (MS/MSD) were performed on the following sample(s): 10166898013,10166973004

M6: Matrix spike and Matrix spike duplicate recovery not evaluated against control limits due to sample dilution.

- Chromium
- Copper
- Iron
- Lead
- Manganese
- Nickel
- Zinc

- MS (Lab ID: 1037980)
  - Arsenic
  - Barium
  - Cadmium
  - Chromium
  - Copper
  - Iron
  - Lead
  - Manganese
  - Nickel
  - Selenium
  - Silver
  - Zinc
- MSD (Lab ID: 1037979)
  - Antimony
  - Barium
  - Cadmium
  - Chromium
  - Copper
  - Iron
  - Lead
  - Manganese
  - Nickel
  - Zinc

Duplicate Sample:
All duplicate sample results were within method acceptance criteria with any exceptions noted below.

Additional Comments:

Analyte Comments:

QC Batch: MPRP/27890

E: Analyte concentration exceeded the calibration range. The reported result is estimated.

- MS (Lab ID: 1037978)
  - Manganese

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PROJECT NARRATIVE

Project: Black Pine Mine (06)
Pace Project No.: 10166973

Method: **EPA 6020**
Description: 6020 MET ICPMS
Client: Montana Dept. of Environmental Quality
Date: September 09, 2011

Analyte Comments:

QC Batch: MPRP/27890

E: Analyte concentration exceeded the calibration range. The reported result is estimated.

- MS (Lab ID: 1037978)
  - Zinc
- MSD (Lab ID: 1037979)
  - Manganese
  - Zinc

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PROJECT NARRATIVE

Project: Black Pine Mine (06)
Pace Project No.: 10166973

Method: **EPA 7471**
Description: 7471 Mercury
Client: Montana Dept. of Environmental Quality
Date: September 09, 2011

General Information:
9 samples were analyzed for EPA 7471. All samples were received in acceptable condition with any exceptions noted below.

Hold Time:
The samples were analyzed within the method required hold times with any exceptions noted below.

Sample Preparation:
The samples were prepared in accordance with EPA 7471 with any exceptions noted below.

Initial Calibrations (including MS Tune as applicable):
All criteria were within method requirements with any exceptions noted below.

Continuing Calibration:
All criteria were within method requirements with any exceptions noted below.

Method Blank:
All analytes were below the report limit in the method blank with any exceptions noted below.

Laboratory Control Spike:
All laboratory control spike compounds were within QC limits with any exceptions noted below.

Matrix Spikes:
All percent recoveries and relative percent differences (RPDs) were within acceptance criteria with any exceptions noted below.

Duplicate Sample:
All duplicate sample results were within method acceptance criteria with any exceptions noted below.

Additional Comments:

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PROJECT NARRATIVE

Project: Black Pine Mine (06)
Pace Project No.: 10166973

Method: **ASA 33-3.2/EPA 353.2**
Description: 353.2 Nitrate + Nitrite pres.
Client: Montana Dept. of Environmental Quality
Date: September 09, 2011

General Information:
1 sample was analyzed for ASA 33-3.2/EPA 353.2. All samples were received in acceptable condition with any exceptions noted below.

Hold Time:
The samples were analyzed within the method required hold times with any exceptions noted below.

Initial Calibrations (including MS Tune as applicable):
All criteria were within method requirements with any exceptions noted below.

Continuing Calibration:
All criteria were within method requirements with any exceptions noted below.

Internal Standards:
All internal standards were within QC limits with any exceptions noted below.

Surrogates:
All surrogates were within QC limits with any exceptions noted below.

Method Blank:
All analytes were below the report limit in the method blank with any exceptions noted below.

Laboratory Control Spike:
All laboratory control spike compounds were within QC limits with any exceptions noted below.

Matrix Spikes:
All percent recoveries and relative percent differences (RPDs) were within acceptance criteria with any exceptions noted below.

Duplicate Sample:
All duplicate sample results were within method acceptance criteria with any exceptions noted below.

Additional Comments:

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PROJECT NARRATIVE

Project: Black Pine Mine (06)
Pace Project No.: 10166973

Method: **ASTM D421**
Description: Coarse
Client: Montana Dept. of Environmental Quality
Date: September 09, 2011

General Information:
1 sample was analyzed for ASTM D421. All samples were received in acceptable condition with any exceptions noted below.

Hold Time:
The samples were analyzed within the method required hold times with any exceptions noted below.

Initial Calibrations (including MS Tune as applicable):
All criteria were within method requirements with any exceptions noted below.

Continuing Calibration:
All criteria were within method requirements with any exceptions noted below.

Internal Standards:
All internal standards were within QC limits with any exceptions noted below.

Surrogates:
All surrogates were within QC limits with any exceptions noted below.

Method Blank:
All analytes were below the report limit in the method blank with any exceptions noted below.

Laboratory Control Spike:
All laboratory control spike compounds were within QC limits with any exceptions noted below.

Matrix Spikes:
All percent recoveries and relative percent differences (RPDs) were within acceptance criteria with any exceptions noted below.

Duplicate Sample:
All duplicate sample results were within method acceptance criteria with any exceptions noted below.

Additional Comments:

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PROJECT NARRATIVE

Project: Black Pine Mine (06)
Pace Project No.: 10166973

Method: **ASA 29-3.5.2**
Description: Organic Matter MT ASA 29
Client: Montana Dept. of Environmental Quality
Date: September 09, 2011

General Information:
1 sample was analyzed for ASA 29-3.5.2. All samples were received in acceptable condition with any exceptions noted below.

Hold Time:
The samples were analyzed within the method required hold times with any exceptions noted below.

Initial Calibrations (including MS Tune as applicable):
All criteria were within method requirements with any exceptions noted below.

Continuing Calibration:
All criteria were within method requirements with any exceptions noted below.

Internal Standards:
All internal standards were within QC limits with any exceptions noted below.

Surrogates:
All surrogates were within QC limits with any exceptions noted below.

Method Blank:
All analytes were below the report limit in the method blank with any exceptions noted below.

Laboratory Control Spike:
All laboratory control spike compounds were within QC limits with any exceptions noted below.

Matrix Spikes:
All percent recoveries and relative percent differences (RPDs) were within acceptance criteria with any exceptions noted below.

Duplicate Sample:
All duplicate sample results were within method acceptance criteria with any exceptions noted below.

Additional Comments:

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PROJECT NARRATIVE

Project: Black Pine Mine (06)
Pace Project No.: 10166973

Method: **ASA 10-3.2**
Description: ASA 10-3.2 pH
Client: Montana Dept. of Environmental Quality
Date: September 09, 2011

General Information:
1 sample was analyzed for ASA 10-3.2. All samples were received in acceptable condition with any exceptions noted below.

Hold Time:
The samples were analyzed within the method required hold times with any exceptions noted below.

Initial Calibrations (including MS Tune as applicable):
All criteria were within method requirements with any exceptions noted below.

Continuing Calibration:
All criteria were within method requirements with any exceptions noted below.

Internal Standards:
All internal standards were within QC limits with any exceptions noted below.

Surrogates:
All surrogates were within QC limits with any exceptions noted below.

Method Blank:
All analytes were below the report limit in the method blank with any exceptions noted below.

Laboratory Control Spike:
All laboratory control spike compounds were within QC limits with any exceptions noted below.

Matrix Spikes:
All percent recoveries and relative percent differences (RPDs) were within acceptance criteria with any exceptions noted below.

Duplicate Sample:
All duplicate sample results were within method acceptance criteria with any exceptions noted below.

Additional Comments:

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PROJECT NARRATIVE

Project: Black Pine Mine (06)
Pace Project No.: 10166973

Method: **ASA 24-5.4/SM4500**
Description: SM4500P-E, Total Phosphorus
Client: Montana Dept. of Environmental Quality
Date: September 09, 2011

General Information:
1 sample was analyzed for ASA 24-5.4/SM4500. All samples were received in acceptable condition with any exceptions noted below.

Hold Time:
The samples were analyzed within the method required hold times with any exceptions noted below.

Initial Calibrations (including MS Tune as applicable):
All criteria were within method requirements with any exceptions noted below.

Continuing Calibration:
All criteria were within method requirements with any exceptions noted below.

Internal Standards:
All internal standards were within QC limits with any exceptions noted below.

Surrogates:
All surrogates were within QC limits with any exceptions noted below.

Method Blank:
All analytes were below the report limit in the method blank with any exceptions noted below.

Laboratory Control Spike:
All laboratory control spike compounds were within QC limits with any exceptions noted below.

Matrix Spikes:
All percent recoveries and relative percent differences (RPDs) were within acceptance criteria with any exceptions noted below.

Duplicate Sample:
All duplicate sample results were within method acceptance criteria with any exceptions noted below.

Additional Comments:

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PROJECT NARRATIVE

Project: Black Pine Mine (06)
Pace Project No.: 10166973

Method: **Modified Sobek 3.2**
Description: Sobek Acid Base Potential
Client: Montana Dept. of Environmental Quality
Date: September 09, 2011

General Information:
1 sample was analyzed for Modified Sobek 3.2. All samples were received in acceptable condition with any exceptions noted below.

Hold Time:
The samples were analyzed within the method required hold times with any exceptions noted below.

Initial Calibrations (including MS Tune as applicable):
All criteria were within method requirements with any exceptions noted below.

Continuing Calibration:
All criteria were within method requirements with any exceptions noted below.

Internal Standards:
All internal standards were within QC limits with any exceptions noted below.

Surrogates:
All surrogates were within QC limits with any exceptions noted below.

Method Blank:
All analytes were below the report limit in the method blank with any exceptions noted below.

Laboratory Control Spike:
All laboratory control spike compounds were within QC limits with any exceptions noted below.

Matrix Spikes:
All percent recoveries and relative percent differences (RPDs) were within acceptance criteria with any exceptions noted below.

Duplicate Sample:
All duplicate sample results were within method acceptance criteria with any exceptions noted below.

Additional Comments:

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PROJECT NARRATIVE

Project: Black Pine Mine (06)
Pace Project No.: 10166973

Method: **Modified Sobek 3.2**
Description: Sobek Extractable Sulfur
Client: Montana Dept. of Environmental Quality
Date: September 09, 2011

General Information:
1 sample was analyzed for Modified Sobek 3.2. All samples were received in acceptable condition with any exceptions noted below.

Hold Time:
The samples were analyzed within the method required hold times with any exceptions noted below.

Initial Calibrations (including MS Tune as applicable):
All criteria were within method requirements with any exceptions noted below.

Continuing Calibration:
All criteria were within method requirements with any exceptions noted below.

Internal Standards:
All internal standards were within QC limits with any exceptions noted below.

Surrogates:
All surrogates were within QC limits with any exceptions noted below.

Method Blank:
All analytes were below the report limit in the method blank with any exceptions noted below.

Laboratory Control Spike:
All laboratory control spike compounds were within QC limits with any exceptions noted below.

Matrix Spikes:
All percent recoveries and relative percent differences (RPDs) were within acceptance criteria with any exceptions noted below.

Duplicate Sample:
All duplicate sample results were within method acceptance criteria with any exceptions noted below.

Additional Comments:

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PROJECT NARRATIVE

Project: Black Pine Mine (06)
Pace Project No.: 10166973

Method: **Modified Sobek 3.2**
Description: Sobek Calculations
Client: Montana Dept. of Environmental Quality
Date: September 09, 2011

General Information:
1 sample was analyzed for Modified Sobek 3.2. All samples were received in acceptable condition with any exceptions noted below.

Hold Time:
The samples were analyzed within the method required hold times with any exceptions noted below.

Initial Calibrations (including MS Tune as applicable):
All criteria were within method requirements with any exceptions noted below.

Continuing Calibration:
All criteria were within method requirements with any exceptions noted below.

Internal Standards:
All internal standards were within QC limits with any exceptions noted below.

Surrogates:
All surrogates were within QC limits with any exceptions noted below.

Method Blank:
All analytes were below the report limit in the method blank with any exceptions noted below.

Laboratory Control Spike:
All laboratory control spike compounds were within QC limits with any exceptions noted below.

Matrix Spikes:
All percent recoveries and relative percent differences (RPDs) were within acceptance criteria with any exceptions noted below.

Duplicate Sample:
All duplicate sample results were within method acceptance criteria with any exceptions noted below.

Additional Comments:

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PROJECT NARRATIVE

Project: Black Pine Mine (06)
Pace Project No.: 10166973

Method: **Modified Sobek 3.2**
Description: Sobek SMP Buffer pH
Client: Montana Dept. of Environmental Quality
Date: September 09, 2011

General Information:
1 sample was analyzed for Modified Sobek 3.2. All samples were received in acceptable condition with any exceptions noted below.

Hold Time:
The samples were analyzed within the method required hold times with any exceptions noted below.

Initial Calibrations (including MS Tune as applicable):
All criteria were within method requirements with any exceptions noted below.

Continuing Calibration:
All criteria were within method requirements with any exceptions noted below.

Internal Standards:
All internal standards were within QC limits with any exceptions noted below.

Surrogates:
All surrogates were within QC limits with any exceptions noted below.

Method Blank:
All analytes were below the report limit in the method blank with any exceptions noted below.

Laboratory Control Spike:
All laboratory control spike compounds were within QC limits with any exceptions noted below.

Matrix Spikes:
All percent recoveries and relative percent differences (RPDs) were within acceptance criteria with any exceptions noted below.

Duplicate Sample:
All duplicate sample results were within method acceptance criteria with any exceptions noted below.

Additional Comments:

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PROJECT NARRATIVE

Project: Black Pine Mine (06)
Pace Project No.: 10166973

Method: **ASA 10-3.3**
Description: ASA10-3.3 Specific Conductance
Client: Montana Dept. of Environmental Quality
Date: September 09, 2011

General Information:
1 sample was analyzed for ASA 10-3.3. All samples were received in acceptable condition with any exceptions noted below.

Hold Time:
The samples were analyzed within the method required hold times with any exceptions noted below.

Initial Calibrations (including MS Tune as applicable):
All criteria were within method requirements with any exceptions noted below.

Continuing Calibration:
All criteria were within method requirements with any exceptions noted below.

Internal Standards:
All internal standards were within QC limits with any exceptions noted below.

Surrogates:
All surrogates were within QC limits with any exceptions noted below.

Method Blank:
All analytes were below the report limit in the method blank with any exceptions noted below.

Laboratory Control Spike:
All laboratory control spike compounds were within QC limits with any exceptions noted below.

Matrix Spikes:
All percent recoveries and relative percent differences (RPDs) were within acceptance criteria with any exceptions noted below.

Duplicate Sample:
All duplicate sample results were within method acceptance criteria with any exceptions noted below.

Additional Comments:

This data package has been reviewed for quality and completeness and is approved for release.

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ANALYTICAL RESULTS

Project: Black Pine Mine (06)
Pace Project No.: 10166973

Sample: BP-RY-06-00 **Lab ID: 10166973001** Collected: 08/16/11 11:10 Received: 08/18/11 09:10 Matrix: Solid

Results reported on a "dry-weight" basis

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
6020 MET ICPMS	Analytical Method: EPA 6020 Preparation Method: EPA 3050							
Antimony	**5.5**	mg/kg	0.55	20	08/24/11 09:04	08/30/11 01:33	7440-36-0	
Arsenic	**13.1**	mg/kg	0.55	20	08/24/11 09:04	08/30/11 01:33	7440-38-2	
Barium	**122**	mg/kg	0.33	20	08/24/11 09:04	08/30/11 01:33	7440-39-3	
Cadmium	**0.58**	mg/kg	0.088	20	08/24/11 09:04	08/30/11 01:33	7440-43-9	
Chromium	**13.2**	mg/kg	0.55	20	08/24/11 09:04	08/30/11 01:33	7440-47-3	
Copper	**219**	mg/kg	0.55	20	08/24/11 09:04	08/30/11 01:33	7440-50-8	
Iron	**13300**	mg/kg	54.8	20	08/24/11 09:04	08/30/11 01:33	7439-89-6	
Lead	**45.6**	mg/kg	0.11	20	08/24/11 09:04	08/30/11 01:33	7439-92-1	
Manganese	**384**	mg/kg	0.55	20	08/24/11 09:04	08/30/11 01:33	7439-96-5	
Nickel	**12.3**	mg/kg	0.55	20	08/24/11 09:04	08/30/11 01:33	7440-02-0	
Silver	**1.5**	mg/kg	1.1	40	08/24/11 09:04	08/30/11 12:31	7440-22-4	
Zinc	**53.9**	mg/kg	5.5	20	08/24/11 09:04	08/30/11 01:33	7440-66-6	
7471 Mercury	Analytical Method: EPA 7471 Preparation Method: EPA 7471							
Mercury	**0.026**	mg/kg	0.019	1	08/23/11 14:06	08/24/11 11:18	7439-97-6	
Dry Weight	Analytical Method: % Moisture							
Percent Moisture	**8.7**	%	0.10	1		08/30/11 00:00		

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ANALYTICAL RESULTS

Project: Black Pine Mine (06)
Pace Project No.: 10166973

Sample: BP-RY-06-04 **Lab ID: 10166973002** Collected: 08/16/11 11:20 Received: 08/18/11 09:10 Matrix: Solid

Results reported on a "dry-weight" basis

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
6020 MET ICPMS	Analytical Method: EPA 6020 Preparation Method: EPA 3050							
Antimony	**0.86**	mg/kg	0.56	20	08/24/11 09:04	08/30/11 01:42	7440-36-0	
Arsenic	**7.9**	mg/kg	0.56	20	08/24/11 09:04	08/30/11 01:42	7440-38-2	
Barium	**105**	mg/kg	0.34	20	08/24/11 09:04	08/30/11 01:42	7440-39-3	
Cadmium	**0.46**	mg/kg	0.089	20	08/24/11 09:04	08/30/11 01:42	7440-43-9	
Chromium	**17.9**	mg/kg	0.56	20	08/24/11 09:04	08/30/11 01:42	7440-47-3	
Copper	**310**	mg/kg	0.56	20	08/24/11 09:04	08/30/11 01:42	7440-50-8	
Iron	**19300**	mg/kg	55.9	20	08/24/11 09:04	08/30/11 01:42	7439-89-6	
Lead	**11.2**	mg/kg	0.11	20	08/24/11 09:04	08/30/11 01:42	7439-92-1	
Manganese	**110**	mg/kg	0.56	20	08/24/11 09:04	08/30/11 01:42	7439-96-5	
Nickel	**15.0**	mg/kg	0.56	20	08/24/11 09:04	08/30/11 01:42	7440-02-0	
Silver	**<0.56**	mg/kg	0.56	20	08/24/11 09:04	08/30/11 01:42	7440-22-4	CH
Zinc	**57.4**	mg/kg	5.6	20	08/24/11 09:04	08/30/11 01:42	7440-66-6	
7471 Mercury	Analytical Method: EPA 7471 Preparation Method: EPA 7471							
Mercury	**0.097**	mg/kg	0.020	1	08/23/11 14:06	08/24/11 11:20	7439-97-6	
Dry Weight	Analytical Method: % Moisture							
Percent Moisture	**14.9**	%	0.10	1		08/30/11 00:00		

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ANALYTICAL RESULTS

Project: Black Pine Mine (06)
Pace Project No.: 10166973

Sample: BP-RY-07-00 **Lab ID: 10166973003** Collected: 08/17/11 08:15 Received: 08/18/11 09:10 Matrix: Solid

Results reported on a "dry-weight" basis

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
6020 MET ICPMS	Analytical Method: EPA 6020 Preparation Method: EPA 3050							
Antimony	**0.98**	mg/kg	0.48	20	08/24/11 09:04	08/30/11 01:51	7440-36-0	
Arsenic	**7.2**	mg/kg	0.48	20	08/24/11 09:04	08/30/11 01:51	7440-38-2	
Barium	**216**	mg/kg	0.29	20	08/24/11 09:04	08/30/11 01:51	7440-39-3	
Cadmium	**0.20**	mg/kg	0.077	20	08/24/11 09:04	08/30/11 01:51	7440-43-9	
Chromium	**7.6**	mg/kg	0.48	20	08/24/11 09:04	08/30/11 01:51	7440-47-3	
Copper	**6.4**	mg/kg	0.48	20	08/24/11 09:04	08/30/11 01:51	7440-50-8	
Iron	**9880**	mg/kg	48.0	20	08/24/11 09:04	08/30/11 01:51	7439-89-6	
Lead	**13.7**	mg/kg	0.096	20	08/24/11 09:04	08/30/11 01:51	7439-92-1	
Manganese	**1840**	mg/kg	4.8	200	08/24/11 09:04	08/30/11 01:56	7439-96-5	
Nickel	**9.6**	mg/kg	0.48	20	08/24/11 09:04	08/30/11 01:51	7440-02-0	
Silver	**<0.48**	mg/kg	0.48	20	08/24/11 09:04	08/30/11 01:51	7440-22-4	CH
Zinc	**32.0**	mg/kg	4.8	20	08/24/11 09:04	08/30/11 01:51	7440-66-6	
7471 Mercury	Analytical Method: EPA 7471 Preparation Method: EPA 7471							
Mercury	**0.037**	mg/kg	0.019	1	08/23/11 14:06	08/24/11 11:27	7439-97-6	
Dry Weight	Analytical Method: % Moisture							
Percent Moisture	**6.2**	%	0.10	1		08/30/11 00:00		

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ANALYTICAL RESULTS

Project: Black Pine Mine (06)
Pace Project No.: 10166973

Sample: BP-RY-07-10 **Lab ID: 10166973004** Collected: 08/17/11 08:50 Received: 08/18/11 09:10 Matrix: Solid

Results reported on a "dry-weight" basis

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
6020 MET ICPMS	Analytical Method: EPA 6020 Preparation Method: EPA 3050							
Antimony	**1.1**	mg/kg	0.49	20	08/24/11 09:04	08/30/11 02:01	7440-36-0	
Arsenic	**8.3**	mg/kg	0.49	20	08/24/11 09:04	08/30/11 02:01	7440-38-2	M6
Barium	**114**	mg/kg	0.29	20	08/24/11 09:04	08/30/11 02:01	7440-39-3	M6
Cadmium	**<0.078**	mg/kg	0.078	20	08/24/11 09:04	08/30/11 02:01	7440-43-9	M6
Chromium	**14.1**	mg/kg	0.49	20	08/24/11 09:04	08/30/11 02:01	7440-47-3	M6
Copper	**16.4**	mg/kg	0.49	20	08/24/11 09:04	08/30/11 02:01	7440-50-8	M6
Iron	**17300**	mg/kg	49.0	20	08/24/11 09:04	08/30/11 02:01	7439-89-6	M6
Lead	**15.8**	mg/kg	0.098	20	08/24/11 09:04	08/30/11 02:01	7439-92-1	M6
Manganese	**216**	mg/kg	0.49	20	08/24/11 09:04	08/30/11 02:01	7439-96-5	M6
Nickel	**14.9**	mg/kg	0.49	20	08/24/11 09:04	08/30/11 02:01	7440-02-0	M6
Silver	**<0.49**	mg/kg	0.49	20	08/24/11 09:04	08/30/11 02:01	7440-22-4	CH,M6
Zinc	**27.2**	mg/kg	4.9	20	08/24/11 09:04	08/30/11 02:01	7440-66-6	M6
7471 Mercury	Analytical Method: EPA 7471 Preparation Method: EPA 7471							
Mercury	**0.065**	mg/kg	0.024	1	08/23/11 14:06	08/24/11 11:29	7439-97-6	
Dry Weight	Analytical Method: % Moisture							
Percent Moisture	**15.0**	%	0.10	1		08/30/11 00:00		

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ANALYTICAL RESULTS

Project: Black Pine Mine (06)
Pace Project No.: 10166973

Sample: BP-RY-08-00 **Lab ID: 10166973005** Collected: 08/17/11 12:10 Received: 08/18/11 09:10 Matrix: Solid

Results reported on a "dry-weight" basis

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
6010 MET ICP, MDEQ Potassium	Analytical Method: CLPICPAES Preparation Method: ASA 13-3.5.2.2							
Potassium	**86.0**	mg/kg	26.8	1	08/30/11 08:21	08/30/11 11:47	7440-09-7	L2
Cation Exchange Capacity	Analytical Method: EPA 9081							
Cation Exchange Capacity	**11.2**	meq/100g	0.98	10	08/31/11 12:00	09/01/11 11:53		
6020 MET ICPMS	Analytical Method: EPA 6020 Preparation Method: EPA 3050							
Antimony	**19.3**	mg/kg	0.50	20	08/24/11 09:04	08/30/11 12:40	7440-36-0	
Arsenic	**52.1**	mg/kg	0.50	20	08/24/11 09:04	08/30/11 12:40	7440-38-2	
Barium	**90.2**	mg/kg	0.30	20	08/24/11 09:04	08/30/11 12:40	7440-39-3	
Cadmium	**0.35**	mg/kg	0.080	20	08/24/11 09:04	08/30/11 12:40	7440-43-9	
Chromium	**3.6**	mg/kg	0.50	20	08/24/11 09:04	08/30/11 12:40	7440-47-3	
Copper	**70.7**	mg/kg	0.50	20	08/24/11 09:04	08/30/11 12:40	7440-50-8	
Iron	**9240**	mg/kg	49.9	20	08/24/11 09:04	08/30/11 12:40	7439-89-6	
Lead	**217**	mg/kg	0.10	20	08/24/11 09:04	08/30/11 12:40	7439-92-1	
Manganese	**146**	mg/kg	0.50	20	08/24/11 09:04	08/30/11 12:40	7439-96-5	
Nickel	**4.4**	mg/kg	0.50	20	08/24/11 09:04	08/30/11 12:40	7440-02-0	
Silver	**0.83**	mg/kg	0.50	20	08/24/11 09:04	08/30/11 12:40	7440-22-4	
Zinc	**129**	mg/kg	5.0	20	08/24/11 09:04	08/30/11 12:40	7440-66-6	
7471 Mercury	Analytical Method: EPA 7471 Preparation Method: EPA 7471							
Mercury	**0.020**	mg/kg	0.019	1	08/23/11 14:06	08/24/11 11:31	7439-97-6	
Dry Weight	Analytical Method: % Moisture							
Percent Moisture	**8.0**	%	0.10	1		08/30/11 00:00		
353.2 Nitrate + Nitrite pres.	Analytical Method: ASA 33-3.2/EPA 353.2							
Available Nitrate	**<5.0**	mg/kg	5.0	1		08/31/11 13:26		
Coarse	Analytical Method: ASTM D421							
Coarse Fragment	**63.7**	%	0.10	1		08/23/11 00:00		
Organic Matter MT ASA 29	Analytical Method: ASA 29-3.5.2							
Organic Matter	**2.4**	% (w/w)	0.10	1		08/30/11 15:00		
ASA 10-3.2 pH	Analytical Method: ASA 10-3.2							
pH, Saturated Paste	**7.5**	Std. Units	0.10	1		08/25/11 16:05		
SM4500P-E, Total Phosphorus	Analytical Method: ASA 24-5.4/SM4500							
Available Phosphorus	**2.8**	mg/kg	1.0	1		08/24/11 15:47	7723-14-0	
Sobek Acid Base Potential	Analytical Method: Modified Sobek 3.2							
Neutralization Potential	**2.4**	tons/1000	0.50	1		08/31/11 00:00		

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ANALYTICAL RESULTS

Project: Black Pine Mine (06)
Pace Project No.: 10166973

Sample: BP-RY-08-00 **Lab ID: 10166973005** Collected: 08/17/11 12:10 Received: 08/18/11 09:10 Matrix: Solid

Results reported on a "dry-weight" basis

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
Sobek Extractable Sulfur	Analytical Method: Modified Sobek 3.2							
Sulfur, HCl Extractable	**<0.050**	% (w/w)	0.050	1		08/30/11 10:11		
Sulfur, HNO3 Extractable	**<0.050**	% (w/w)	0.050	1		08/30/11 10:11		
Sulfur, Hot Water Extractable	**<0.050**	% (w/w)	0.050	1		08/30/11 10:11		
Sulfur, Residual	**<0.050**	% (w/w)	0.050	1		08/30/11 10:11		
Total Sulfur	**<0.050**	% (w/w)	0.050	1		08/30/11 10:11		
Sobek Calculations	Analytical Method: Modified Sobek 3.2							
Acid/Base Potential	**2.4**	tons/1000		1		08/31/11 00:00		
Acid Potential	**<4.3**	tons/1000	4.3	1		08/31/11 00:00		
Lime Requirement	**<5.4**	tons/1000	5.4	1		08/31/11 00:00		
SMP Lime Requirement	**0**	tons/1000	0.0	1		08/31/11 00:00		
Sobek SMP Buffer pH	Analytical Method: Modified Sobek 3.2							
SMP Buffer pH	**7.0**	Std. Units	0.10	1		08/30/11 14:09		
ASA10-3.3 Specific Conductance	Analytical Method: ASA 10-3.3							
Sp.Conductance Saturated Paste	**0.27**	mmhos/cm	0.010	1		08/25/11 14:32		

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ANALYTICAL RESULTS

Project: Black Pine Mine (06)
Pace Project No.: 10166973

Sample: BP-CML-RCRA-01 **Lab ID: 10166973006** Collected: 08/17/11 10:00 Received: 08/18/11 09:10 Matrix: Solid

Results reported on a "dry-weight" basis

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
6020 MET ICPMS	Analytical Method: EPA 6020 Preparation Method: EPA 3050							
Arsenic	**63.3**	mg/kg	0.48	20	08/24/11 09:04	08/30/11 02:38	7440-38-2	
Barium	**197**	mg/kg	0.29	20	08/24/11 09:04	08/30/11 02:38	7440-39-3	
Cadmium	**0.62**	mg/kg	0.076	20	08/24/11 09:04	08/30/11 02:38	7440-43-9	
Chromium	**54.1**	mg/kg	0.48	20	08/24/11 09:04	08/30/11 02:38	7440-47-3	
Lead	**164**	mg/kg	0.095	20	08/24/11 09:04	08/30/11 02:38	7439-92-1	
Selenium	**<0.48**	mg/kg	0.48	20	08/24/11 09:04	08/30/11 02:38	7782-49-2	
Silver	**3.3**	mg/kg	0.95	40	08/24/11 09:04	08/30/11 12:45	7440-22-4	
7471 Mercury	Analytical Method: EPA 7471 Preparation Method: EPA 7471							
Mercury	**0.51**	mg/kg	0.017	1	08/23/11 14:06	08/24/11 11:33	7439-97-6	
Dry Weight	Analytical Method: % Moisture							
Percent Moisture	**0.19**	%	0.10	1		08/30/11 00:00		

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ANALYTICAL RESULTS

Project: Black Pine Mine (06)
Pace Project No.: 10166973

Sample: BP-CML-RCRA-02 **Lab ID: 10166973007** Collected: 08/17/11 10:45 Received: 08/18/11 09:10 Matrix: Solid

Results reported on a "dry-weight" basis

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
6020 MET ICPMS	Analytical Method: EPA 6020 Preparation Method: EPA 3050							
Arsenic	**680**	mg/kg	1.0	40	08/24/11 09:04	08/30/11 12:50	7440-38-2	
Barium	**191**	mg/kg	0.30	20	08/24/11 09:04	08/30/11 02:47	7440-39-3	
Cadmium	**14.9**	mg/kg	0.081	20	08/24/11 09:04	08/30/11 02:47	7440-43-9	
Chromium	**1.6**	mg/kg	0.51	20	08/24/11 09:04	08/30/11 02:47	7440-47-3	
Lead	**2640**	mg/kg	1.0	200	08/24/11 09:04	08/30/11 02:52	7439-92-1	
Selenium	**0.56**	mg/kg	0.51	20	08/24/11 09:04	08/30/11 02:47	7782-49-2	
Silver	**59.7**	mg/kg	1.0	40	08/24/11 09:04	08/30/11 12:50	7440-22-4	
7471 Mercury	Analytical Method: EPA 7471 Preparation Method: EPA 7471							
Mercury	**5.0**	mg/kg	0.21	10	08/23/11 14:06	08/24/11 11:54	7439-97-6	
Dry Weight	Analytical Method: % Moisture							
Percent Moisture	**6.0**	%	0.10	1		08/30/11 00:00		

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ANALYTICAL RESULTS

Project: Black Pine Mine (06)
Pace Project No.: 10166973

Sample: BP-CML-RCRA-03 **Lab ID: 10166973008** Collected: 08/17/11 11:04 Received: 08/18/11 09:10 Matrix: Solid

Results reported on a "dry-weight" basis

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
6020 MET ICPMS	Analytical Method: EPA 6020 Preparation Method: EPA 3050							
Arsenic	**12.7**	mg/kg	0.49	20	08/24/11 09:04	08/30/11 02:56	7440-38-2	
Barium	**19.5**	mg/kg	0.29	20	08/24/11 09:04	08/30/11 02:56	7440-39-3	
Cadmium	**0.88**	mg/kg	0.078	20	08/24/11 09:04	08/30/11 02:56	7440-43-9	
Chromium	**<0.49**	mg/kg	0.49	20	08/24/11 09:04	08/30/11 02:56	7440-47-3	
Lead	**151**	mg/kg	0.098	20	08/24/11 09:04	08/30/11 02:56	7439-92-1	
Selenium	**<0.49**	mg/kg	0.49	20	08/24/11 09:04	08/30/11 02:56	7782-49-2	
Silver	**8.2**	mg/kg	0.98	40	08/24/11 09:04	08/30/11 12:54	7440-22-4	
7471 Mercury	Analytical Method: EPA 7471 Preparation Method: EPA 7471							
Mercury	**4.4**	mg/kg	0.19	10	08/23/11 14:06	08/24/11 12:02	7439-97-6	
Dry Weight	Analytical Method: % Moisture							
Percent Moisture	**5.1**	%	0.10	1		08/30/11 00:00		

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ANALYTICAL RESULTS

Project: Black Pine Mine (06)
Pace Project No.: 10166973

Sample: BP-CML-RCRA-04 **Lab ID: 10166973009** Collected: 08/17/11 11:34 Received: 08/18/11 09:10 Matrix: Solid

Results reported on a "dry-weight" basis

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
6020 MET ICPMS	Analytical Method: EPA 6020 Preparation Method: EPA 3050							
Arsenic	**138**	mg/kg	0.37	20	08/24/11 09:04	08/30/11 03:06	7440-38-2	
Barium	**547**	mg/kg	2.2	200	08/24/11 09:04	08/30/11 03:10	7440-39-3	
Cadmium	**1.7**	mg/kg	0.060	20	08/24/11 09:04	08/30/11 03:06	7440-43-9	
Chromium	**33.0**	mg/kg	0.37	20	08/24/11 09:04	08/30/11 03:06	7440-47-3	
Lead	**222**	mg/kg	0.075	20	08/24/11 09:04	08/30/11 03:06	7439-92-1	
Selenium	**<0.37**	mg/kg	0.37	20	08/24/11 09:04	08/30/11 03:06	7782-49-2	
Silver	**9.0**	mg/kg	0.75	40	08/24/11 09:04	08/30/11 12:59	7440-22-4	
7471 Mercury	Analytical Method: EPA 7471 Preparation Method: EPA 7471							
Mercury	**1.7**	mg/kg	0.15	10	08/23/11 14:06	08/24/11 12:09	7439-97-6	
Dry Weight	Analytical Method: % Moisture							
Percent Moisture	**0.13**	%	0.10	1		08/30/11 00:00		

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QUALITY CONTROL DATA

Project: Black Pine Mine (06)
Pace Project No.: 10166973

QC Batch: MPRP/28018
QC Batch Method: ASA 13-3.5.2.2
Analysis Method: CLPICPAES
Analysis Description: CLPICPAES MET
Associated Lab Samples: 10166973005

METHOD BLANK: 1041721 Matrix: Solid
Associated Lab Samples: 10166973005

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Potassium	mg/kg	<25.0	25.0	08/30/11 11:34	

LABORATORY CONTROL SAMPLE & LCSD: 1041722 1041723

Parameter	Units	Spike Conc.	LCS Result	LCSD Result	LCS % Rec	LCSD % Rec	% Rec Limits	RPD	Max RPD	Qualifiers
Potassium	mg/kg	313	156	252	50	83	80-120	47	20	D6,L0

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QUALITY CONTROL DATA

Project: Black Pine Mine (06)
Pace Project No.: 10166973

QC Batch: ICP/15164
QC Batch Method: EPA 9081
Analysis Method: EPA 9081
Analysis Description: Cation Exchange Capacity
Associated Lab Samples: 10166973005

METHOD BLANK: 867215 Matrix: Solid
Associated Lab Samples: 10166973005

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Cation Exchange Capacity	meq/100g	<1.0	1.0	09/01/11 11:47	

LABORATORY CONTROL SAMPLE: 867216

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Cation Exchange Capacity	meq/100g	52.2	48.6	93	62-138	

SAMPLE DUPLICATE: 867217

Parameter	Units	10166973005 Result	Dup Result	RPD	Max RPD	Qualifiers
Cation Exchange Capacity	meq/100g	11.2	11.3	1	47	

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QUALITY CONTROL DATA

Project: Black Pine Mine (06)
Pace Project No.: 10166973

QC Batch: MPRP/27890 Analysis Method: EPA 6020
QC Batch Method: EPA 3050 Analysis Description: 6020 MET
Associated Lab Samples: 10166973001, 10166973002, 10166973003, 10166973004, 10166973005, 10166973006, 10166973007, 10166973008, 10166973009

METHOD BLANK: 1037976 Matrix: Solid
Associated Lab Samples: 10166973001, 10166973002, 10166973003, 10166973004, 10166973005, 10166973006, 10166973007, 10166973008, 10166973009

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Antimony	mg/kg	<0.46	0.46	08/29/11 23:37	
Arsenic	mg/kg	<0.46	0.46	08/29/11 23:37	
Barium	mg/kg	<0.28	0.28	08/29/11 23:37	
Cadmium	mg/kg	<0.073	0.073	08/29/11 23:37	
Chromium	mg/kg	<0.46	0.46	08/29/11 23:37	
Copper	mg/kg	<0.46	0.46	08/29/11 23:37	
Iron	mg/kg	<45.9	45.9	08/29/11 23:37	
Lead	mg/kg	<0.092	0.092	08/29/11 23:37	
Manganese	mg/kg	<0.46	0.46	08/29/11 23:37	
Nickel	mg/kg	<0.46	0.46	08/29/11 23:37	
Selenium	mg/kg	<0.46	0.46	08/29/11 23:37	
Silver	mg/kg	<0.46	0.46	08/29/11 23:37	CH
Zinc	mg/kg	<4.6	4.6	08/29/11 23:37	

LABORATORY CONTROL SAMPLE: 1037977

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Antimony	mg/kg	18.3	16.9	92	75-125	
Arsenic	mg/kg	18.3	16.7	91	75-125	
Barium	mg/kg	18.3	16.6	90	75-125	
Cadmium	mg/kg	18.3	17.0	93	75-125	
Chromium	mg/kg	18.3	17.5	96	75-125	
Copper	mg/kg	18.3	17.6	96	75-125	
Iron	mg/kg	229	223	97	75-125	
Lead	mg/kg	18.3	16.5	90	75-125	
Manganese	mg/kg	18.3	17.2	94	75-125	
Nickel	mg/kg	18.3	17.6	96	75-125	
Selenium	mg/kg	18.3	16.9	92	75-125	
Silver	mg/kg	18.3	18.8	102	75-125	
Zinc	mg/kg	18.3	18.0	98	75-125	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 1037978 1037979

Parameter	Units	10166898013 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Antimony	mg/kg	1.0	17.9	17.6	11.2	11.3	57	58	75-125	.7	20	M6
Arsenic	mg/kg	4.3	17.9	17.6	24.0	26.4	110	125	75-125	10	20	
Barium	mg/kg	317	17.9	17.6	406	445	499	728	75-125	9	20	M6

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QUALITY CONTROL DATA

Project: Black Pine Mine (06)
Pace Project No.: 10166973

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 1037978 1037979

Parameter	Units	10166898013 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Cadmium	mg/kg	10.5	17.9	17.6	31.1	35.2	115	140	75-125	13	20	M6
Chromium	mg/kg	7.9	17.9	17.6	31.0	32.5	129	139	75-125	5	20	M6
Copper	mg/kg	22.6	17.9	17.6	48.5	53.0	144	173	75-125	9	20	M6
Iron	mg/kg	17600	224	221	22000	22700	1930	2310	75-125	3	20	M6
Lead	mg/kg	755	17.9	17.6	678	754	-431	-4	75-125	11	20	M6
Manganese	mg/kg	2720	17.9	17.6	3150	3430	2400	4000	75-125	8	20	E,M6
Nickel	mg/kg	7.6	17.9	17.6	31.3	33.3	133	146	75-125	6	20	M6
Selenium	mg/kg	0.26J	17.9	17.6	18.7	20.4	103	114	75-125	8	20	
Silver	mg/kg	1.2	17.9	17.6	21.0	23.1	110	124	75-125	10	20	
Zinc	mg/kg	1400	17.9	17.6	1760	2020	1970	3520	75-125	14	20	E,M6

MATRIX SPIKE SAMPLE: 1037980

Parameter	Units	10166973004 Result	Spike Conc.	MS Result	MS % Rec	% Rec Limits	Qualifiers
Antimony	mg/kg	1.1	23.1	24.7	102	75-125	
Arsenic	mg/kg	8.3	23.1	42.7	149	75-125	M6
Barium	mg/kg	114	23.1	195	354	75-125	M6
Cadmium	mg/kg	<0.078	23.1	32.2	140	75-125	M6
Chromium	mg/kg	14.1	23.1	54.0	173	75-125	M6
Copper	mg/kg	16.4	23.1	57.8	180	75-125	M6
Iron	mg/kg	17300	288	24800	2600	75-125	M6
Lead	mg/kg	15.8	23.1	54.4	167	75-125	M6
Manganese	mg/kg	216	23.1	290	321	75-125	M6
Nickel	mg/kg	14.9	23.1	55.8	177	75-125	M6
Selenium	mg/kg	0.58	23.1	30.4	129	75-125	M6
Silver	mg/kg	<0.49	23.1	32.6	141	75-125	M6
Zinc	mg/kg	27.2	23.1	75.7	210	75-125	M6

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(406)254-7226

QUALITY CONTROL DATA

Project: Black Pine Mine (06)
Pace Project No.: 10166973

QC Batch: MERP/5852 Analysis Method: EPA 7471
QC Batch Method: EPA 7471 Analysis Description: 7471 Mercury
Associated Lab Samples: 10166973001, 10166973002, 10166973003, 10166973004, 10166973005, 10166973006, 10166973007, 10166973008, 10166973009

METHOD BLANK: 1038655 Matrix: Solid
Associated Lab Samples: 10166973001, 10166973002, 10166973003, 10166973004, 10166973005, 10166973006, 10166973007, 10166973008, 10166973009

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Mercury	mg/kg	<0.017	0.017	08/24/11 11:08	

LABORATORY CONTROL SAMPLE: 1038656

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Mercury	mg/kg	.39	0.42	106	80-120	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 1038657 1038658

Parameter	Units	10166923001 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Mercury	mg/kg	0.15	.5	.46	0.64	0.61	96	99	80-120	4	20	

REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL DATA

Project: Black Pine Mine (06)
Pace Project No.: 10166973

QC Batch: MPRP/28093 Analysis Method: % Moisture
QC Batch Method: % Moisture Analysis Description: Dry Weight/Percent Moisture
Associated Lab Samples: 10166973001, 10166973002, 10166973003, 10166973004, 10166973005, 10166973006, 10166973007, 10166973008, 10166973009

SAMPLE DUPLICATE: 1044468

Parameter	Units	10167188001 Result	Dup Result	RPD	Max RPD	Qualifiers
Percent Moisture	%	3.1	3.1	1	30	

SAMPLE DUPLICATE: 1044469

Parameter	Units	10166973009 Result	Dup Result	RPD	Max RPD	Qualifiers
Percent Moisture	%	0.13	0.12	5	30	

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QUALITY CONTROL DATA

Project: Black Pine Mine (06)
Pace Project No.: 10166973

QC Batch: MT/6810 Analysis Method: ASA 33-3.2/EPA 353.2
QC Batch Method: ASA 33-3.2/EPA 353.2 Analysis Description: 353.2 Nitrate + Nitrite
Associated Lab Samples: 10166973005

METHOD BLANK: 1039873 Matrix: Solid
Associated Lab Samples: 10166973005

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Available Nitrate	mg/kg	<5.0	5.0	08/31/11 13:22	

LABORATORY CONTROL SAMPLE: 1039874

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Available Nitrate	mg/kg	25	25.8	103	76-124	

SAMPLE DUPLICATE: 1039875

Parameter	Units	10166973005 Result	Dup Result	RPD	Max RPD	Qualifiers
Available Nitrate	mg/kg	<5.0	<5.0		30	

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QUALITY CONTROL DATA

Project: Black Pine Mine (06)
Pace Project No.: 10166973

QC Batch: MT/6871 Analysis Method: ASA 29-3.5.2
QC Batch Method: ASA 29-3.5.2 Analysis Description: Organic Matter ASA 29
Associated Lab Samples: 10166973005

METHOD BLANK: 1044274 Matrix: Solid
Associated Lab Samples: 10166973005

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Organic Matter	% (w/w)	<0.10	0.10	08/30/11 15:00	

LABORATORY CONTROL SAMPLE: 1044275

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Organic Matter	% (w/w)	3.1	3.2	104	69-131	

SAMPLE DUPLICATE: 1044276

Parameter	Units	10166973005 Result	Dup Result	RPD	Max RPD	Qualifiers
Organic Matter	% (w/w)	2.4	2.0	20	30	

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QUALITY CONTROL DATA

Project: Black Pine Mine (06)
Pace Project No.: 10166973

QC Batch: MT/6804
QC Batch Method: ASA 10-3.2
Analysis Method: ASA 10-3.2
Analysis Description: ASA 10-3.2 pH saturated paste
Associated Lab Samples: 10166973005

LABORATORY CONTROL SAMPLE: 1039534

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
pH, Saturated Paste	Std. Units	7.2	7.7	107	88-112	

SAMPLE DUPLICATE: 1039535

Parameter	Units	10166973005 Result	Dup Result	RPD	Max RPD	Qualifiers
pH, Saturated Paste	Std. Units	7.5	7.5	.5	20	

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QUALITY CONTROL DATA

Project: Black Pine Mine (06)
Pace Project No.: 10166973

QC Batch: MT/6792
QC Batch Method: ASA 24-5.4/SM4500
Associated Lab Samples: 10166973005

Analysis Method: ASA 24-5.4/SM4500
Analysis Description: SM4500P-E, Total Phosphorus

METHOD BLANK: 1039180 Matrix: Solid
Associated Lab Samples: 10166973005

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Available Phosphorus	mg/kg	<1.0	1.0	08/24/11 15:43	

LABORATORY CONTROL SAMPLE: 1039181

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Available Phosphorus	mg/kg	9.9	9.6	97	56-144	

SAMPLE DUPLICATE: 1039182

Parameter	Units	10166332001 Result	Dup Result	RPD	Max RPD	Qualifiers
Available Phosphorus	mg/kg	4.0	3.9	.5	30	

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QUALITY CONTROL DATA

Project: Black Pine Mine (06)
Pace Project No.: 10166973

QC Batch: MT/6867
QC Batch Method: Modified Sobek 3.2
Analysis Method: Modified Sobek 3.2
Analysis Description: Sobek Extractable Sulfur
Associated Lab Samples: 10166973005

METHOD BLANK: 1044258 Matrix: Solid
Associated Lab Samples: 10166973005

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Sulfur, HCl Extractable	% (w/w)	<0.050	0.050	08/30/11 09:41	
Sulfur, HNO3 Extractable	% (w/w)	<0.050	0.050	08/30/11 09:41	
Sulfur, Hot Water Extractable	% (w/w)	<0.050	0.050	08/30/11 09:41	
Sulfur, Residual	% (w/w)	<0.050	0.050	08/30/11 09:41	
Total Sulfur	% (w/w)	<0.050	0.050	08/30/11 09:41	

SAMPLE DUPLICATE: 1044260

Parameter	Units	10166973005 Result	Dup Result	RPD	Max RPD	Qualifiers
Sulfur, HCl Extractable	% (w/w)	<0.050	<0.050		20	
Sulfur, HNO3 Extractable	% (w/w)	<0.050	<0.050		20	
Sulfur, Hot Water Extractable	% (w/w)	<0.050	<0.050		20	
Sulfur, Residual	% (w/w)	<0.050	<0.050		20	
Total Sulfur	% (w/w)	<0.050	<0.050			

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QUALITY CONTROL DATA

Project: Black Pine Mine (06)
Pace Project No.: 10166973

QC Batch: MT/6870
QC Batch Method: Modified Sobek 3.2
Analysis Method: Modified Sobek 3.2
Analysis Description: Sobek SMP Buffer pH
Associated Lab Samples: 10166973005

SAMPLE DUPLICATE: 1044273

Parameter	Units	10166973005 Result	Dup Result	RPD	Max RPD	Qualifiers
SMP Buffer pH	Std. Units	7.0	7.0	.3	20	

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QUALITY CONTROL DATA

Project: Black Pine Mine (06)
Pace Project No.: 10166973

QC Batch: MT/6811 Analysis Method: ASA 10-3.3
QC Batch Method: ASA 10-3.3 Analysis Description: ASA 10-3.3 Specific Conductance
Associated Lab Samples: 10166973005

METHOD BLANK: 1039876 Matrix: Water
Associated Lab Samples: 10166973005

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Sp.Conductance Saturated Paste	mmhos/cm	<0.010	0.010	08/25/11 14:32	

LABORATORY CONTROL SAMPLE: 1039877

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Sp.Conductance Saturated Paste	mmhos/cm	.85	0.94	111	77-123	

SAMPLE DUPLICATE: 1039878

Parameter	Units	10166973005 Result	Dup Result	RPD	Max RPD	Qualifiers
Sp.Conductance Saturated Paste	mmhos/cm	0.27	0.29	7	20	

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QUALIFIERS

Project: Black Pine Mine (06)
Pace Project No.: 10166973

DEFINITIONS

DF - Dilution Factor, if reported, represents the factor applied to the reported data due to changes in sample preparation, dilution of the sample aliquot, or moisture content.

ND - Not Detected at or above adjusted reporting limit.

J - Estimated concentration above the adjusted method detection limit and below the adjusted reporting limit.

MDL - Adjusted Method Detection Limit.

S - Surrogate

1,2-Diphenylhydrazine (8270 listed analyte) decomposes to Azobenzene.

Consistent with EPA guidelines, unrounded data are displayed and have been used to calculate % recovery and RPD values.

LCS(D) - Laboratory Control Sample (Duplicate)

MS(D) - Matrix Spike (Duplicate)

DUP - Sample Duplicate

RPD - Relative Percent Difference

NC - Not Calculable.

SG - Silica Gel - Clean-Up

U - Indicates the compound was analyzed for, but not detected.

N-Nitrosodiphenylamine decomposes and cannot be separated from Diphenylamine using Method 8270. The result reported for each analyte is a combined concentration.

LABORATORIES

PASI-K	Pace Analytical Services - Kansas City
PASI-M	Pace Analytical Services - Minneapolis
PASI-MT	Pace Analytical Services - Montana

ANALYTE QUALIFIERS

CH	The continuing calibration for this compound is outside of Pace Analytical acceptance limits. The results may be biased high.
D6	The relative percent difference (RPD) between the sample and sample duplicate exceeded laboratory control limits.
E	Analyte concentration exceeded the calibration range. The reported result is estimated.
L0	Analyte recovery in the laboratory control sample (LCS) was outside QC limits.
L2	Analyte recovery in the laboratory control sample (LCS) was below QC limits. Results may be biased low.
M6	Matrix spike and Matrix spike duplicate recovery not evaluated against control limits due to sample dilution.

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QUALITY CONTROL DATA CROSS REFERENCE TABLE

Project: Black Pine Mine (06)
Pace Project No.: 10166973

Lab ID	Sample ID	QC Batch Method	QC Batch	Analytical Method	Analytical Batch
10166973005	**BP-RY-08-00**	ASA 13-3.5.2.2	MPRP/28018	CLPICPAES	ICP/11870
10166973005	**BP-RY-08-00**	EPA 9081	ICP/15164	EPA 9081	ICP/13201
10166973001	**BP-RY-06-00**	EPA 3050	MPRP/27890	EPA 6020	ICPM/11354
10166973002	**BP-RY-06-04**	EPA 3050	MPRP/27890	EPA 6020	ICPM/11354
10166973003	**BP-RY-07-00**	EPA 3050	MPRP/27890	EPA 6020	ICPM/11354
10166973004	**BP-RY-07-10**	EPA 3050	MPRP/27890	EPA 6020	ICPM/11354
10166973005	**BP-RY-08-00**	EPA 3050	MPRP/27890	EPA 6020	ICPM/11354
10166973006	**BP-CML-RCRA-01**	EPA 3050	MPRP/27890	EPA 6020	ICPM/11354
10166973007	**BP-CML-RCRA-02**	EPA 3050	MPRP/27890	EPA 6020	ICPM/11354
10166973008	**BP-CML-RCRA-03**	EPA 3050	MPRP/27890	EPA 6020	ICPM/11354
10166973009	**BP-CML-RCRA-04**	EPA 3050	MPRP/27890	EPA 6020	ICPM/11354
10166973001	**BP-RY-06-00**	EPA 7471	MERP/5852	EPA 7471	MERC/6658
10166973002	**BP-RY-06-04**	EPA 7471	MERP/5852	EPA 7471	MERC/6658
10166973003	**BP-RY-07-00**	EPA 7471	MERP/5852	EPA 7471	MERC/6658
10166973004	**BP-RY-07-10**	EPA 7471	MERP/5852	EPA 7471	MERC/6658
10166973005	**BP-RY-08-00**	EPA 7471	MERP/5852	EPA 7471	MERC/6658
10166973006	**BP-CML-RCRA-01**	EPA 7471	MERP/5852	EPA 7471	MERC/6658
10166973007	**BP-CML-RCRA-02**	EPA 7471	MERP/5852	EPA 7471	MERC/6658
10166973008	**BP-CML-RCRA-03**	EPA 7471	MERP/5852	EPA 7471	MERC/6658
10166973009	**BP-CML-RCRA-04**	EPA 7471	MERP/5852	EPA 7471	MERC/6658
10166973001	**BP-RY-06-00**	% Moisture	MPRP/28093		
10166973002	**BP-RY-06-04**	% Moisture	MPRP/28093		
10166973003	**BP-RY-07-00**	% Moisture	MPRP/28093		
10166973004	**BP-RY-07-10**	% Moisture	MPRP/28093		
10166973005	**BP-RY-08-00**	% Moisture	MPRP/28093		
10166973006	**BP-CML-RCRA-01**	% Moisture	MPRP/28093		
10166973007	**BP-CML-RCRA-02**	% Moisture	MPRP/28093		
10166973008	**BP-CML-RCRA-03**	% Moisture	MPRP/28093		
10166973009	**BP-CML-RCRA-04**	% Moisture	MPRP/28093		
10166973005	**BP-RY-08-00**	ASA 33-3.2/EPA 353.2	MT/6810		
10166973005	**BP-RY-08-00**	ASTM D421	MT/6779		
10166973005	**BP-RY-08-00**	ASA 29-3.5.2	MT/6871		
10166973005	**BP-RY-08-00**	ASA 10-3.2	MT/6804		
10166973005	**BP-RY-08-00**	ASA 24-5.4/SM4500	MT/6792		
10166973005	**BP-RY-08-00**	Modified Sobek 3.2	MT/6869		
10166973005	**BP-RY-08-00**	Modified Sobek 3.2	MT/6867		
10166973005	**BP-RY-08-00**	Modified Sobek 3.2	MT/6868		
10166973005	**BP-RY-08-00**	Modified Sobek 3.2	MT/6870		
10166973005	**BP-RY-08-00**	ASA 10-3.3	MT/6811		

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CHAIN-OF-CUSTODY / Analytical Request Document

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The Chain-of-Custody is a LEGAL DOCUMENT. All relevant fields must be completed accurately.

Page: | of |

1509805

Section A Required Client Information:	Section B Required Project Information:	Section C Invoice Information:
Company: HERRERA	Report To: KEVIN HOUCK	Attention: DEVIN CLARY
Address: 101 E Broadway S. Ste 411 Missoula MT 59802	Copy To: DEVIN CLARY / MARK DONNER	Company Name:
		Address:
Email To: khouck@herrerainc.com	Purchase Order No.:	Pace Quote Reference:
Phone: 406-721-4204 Fax:	Project Name: BLACK PINE MINE	Pace Project Manager:
Requested Due Date/TAT: STANDARD TAT	Project Number: 06-	Pace Profile #:

REGULATORY AGENCY: ☐ NPDES ☐ GROUND WATER ☐ DRINKING WATER ☐ UST ☐ RCRA ☐ OTHER

Site Location STATE: MT

Section D Required Client Information

SAMPLE ID (A-Z, 0-9 / , -) Sample IDs MUST BE UNIQUE

Matrix Codes (MATRIX / CODE): Drinking Water DW; Water WT; Waste Water WW; Product P; Soil/Solid SL; Oil OL; Wipe WP; Air AR; Tissue TS; Other OT

Requested Analysis Filtered (Y/N)

ITEM #	SAMPLE ID	MATRIX CODE (see valid codes to left)	SAMPLE TYPE (G=GRAB C=COMP)	COLLECTED: COMPOSITE START DATE	COMPOSITE START TIME	COMPOSITE END/GRAB DATE	COMPOSITE END/GRAB TIME	SAMPLE TEMP AT COLLECTION	# OF CONTAINERS	Preservatives: Unpreserved	H_2SO_4	HNO_3	HCl	NaOH	$Na_2S_2O_3$	Methanol	Other	Analysis Test Y/N	Total Recov. Metals (Method 6020/7471)	Asbestos	RCRA	Residual Chlorine (Y/N)	Pace Project No./ Lab I.D.
1	BP-RY-06-00	SL	G			8-16-11	1110		1	X								X	X				001
2	BP-RY-06-04	SL	G			8-16-11	1120		1	X								X	X				002
3	BP-RY-07-00	SL	G			8-17-11	0815		1	X								X	X				003
4	BP-RY-07-10	SL	G			8-17-11	0850		1	X								X	X				004
5	BP-RY-08-00	SL	G			8-17-11	1210		2	X								X	X	X			005
6																						BH	
7	BP-CML-RCRA-01	SL	C			8-17-11	10:00		1	X											X		006
8	BP-CML-RCRA-02	SL	C			8-17-11	10:45		1	X											X		007
9	BP-CML-RCRA-03	SL	C			8-17-11	11:04		1	X											X		008
10	BP-CML-RCRA-04	SL	C			8-17-11	11:34		1	X											X		009
11																							
12																							

ADDITIONAL COMMENTS	RELINQUISHED BY / AFFILIATION	DATE	TIME	ACCEPTED BY / AFFILIATION	DATE	TIME	SAMPLE CONDITIONS
	[signature] / HERRERA	8-17-11	1437				Fedex - express
	[signature]	8-17-11	1437	Dan Singer [signature]	8-18-11	0910	
				Rory Vandepitte			5.9° ICE
							N/A N N Y

SAMPLER NAME AND SIGNATURE

PRINT Name of SAMPLER: BRADY HANSON

SIGNATURE of SAMPLER: [signature] DATE Signed (MM/DD/YY): 08/17/11

Temp in °C | Received on Ice (Y/N) | Custody Sealed Cooler (Y/N) | Samples Intact (Y/N)

*Important Note: By signing this form you are accepting Pace's NET 30 day payment terms and agreeing to late charges of 1.5% per month for any invoices not paid within 30 days.

Sample Condition Upon Receipt

Pace Analytical

Client Name: Herrera - MDEQ Project # 10166973

Courier: ☒ Fed Ex ☐ UPS ☐ USPS ☐ Client ☐ Commercial ☒ Pace Other _____

Tracking #: 5665 4819 Ray Picked up from Energy.

Custody Seal on Cooler/Box Present: ☒ yes ☐ no Seals intact: ☒ yes ☐ no

Packing Material: ☐ Bubble Wrap ☒ Bubble Bags ☐ None ☐ Other _____ Temp Blank: Yes X No _____

Thermometer Used: 1383045 or 135 Type of Ice: (Wet) Blue None ☒ Samples on ice, cooling process has begun

Cooler Temperature: 5.9 Biological Tissue is Frozen: Yes No

Date and Initials of person examining contents: RWW 8/19/14

Temp should be above freezing to 6°C

Comments:

Chain of Custody Present:	☒Yes ☐No ☐N/A	1.
Chain of Custody Filled Out:	☒Yes ☐No ☐N/A	2.
Chain of Custody Relinquished:	☒Yes ☐No ☐N/A	3.
Sampler Name & Signature on COC:	☒Yes ☐No ☐N/A	4.
Samples Arrived within Hold Time:	☒Yes ☐No ☐N/A	5.
Short Hold Time Analysis (<72hr):	☐Yes ☒No ☐N/A	6.
Rush Turn Around Time Requested:	☐Yes ☒No ☐N/A	7.
Sufficient Volume:	☒Yes ☐No ☐N/A	8.
Correct Containers Used:	☒Yes ☐No ☐N/A	9. PB
-Pace Containers Used:	☐Yes ☒No ☐N/A	
Containers Intact:	☒Yes ☐No ☐N/A	10.
Filtered volume received for Dissolved tests	☐Yes ☐No ☒N/A	11.
Sample Labels match COC:	☒Yes ☐No ☐N/A	12.
-Includes date/time/ID/Analysis Matrix: SL		
All containers needing acid/base preservation have been checked. Noncompliance are noted in 13.	☐Yes ☐No ☒N/A	13. ☐ HNO3 ☐ H2SO4 ☐ NaOH ☐ HCl Samp #
All containers needing preservation are found to be in compliance with EPA recommendation.	☐Yes ☐No ☒N/A	
Exceptions: VOA,Coliform, TOC, Oil and Grease, WI-DRO (water)	☐Yes ☒No	Initial when completed / Lot # of added preservative
Samples checked for dechlorination:	☐Yes ☐No ☒N/A	14.
Headspace in VOA Vials (>6mm):	☐Yes ☐No ☒N/A	15.
Trip Blank Present:	☐Yes ☒No ☐N/A	16.
Trip Blank Custody Seals Present	☐Yes ☐No ☒N/A	
Pace Trip Blank Lot # (if purchased): NA		

Client Notification/ Resolution: Field Data Required? Y / N

Person Contacted: _____ Date/Time: _____

Comments/ Resolution: _____

Project Manager Review: [signature] **Date:** 8/19/14

Note: Whenever there is a discrepancy affecting North Carolina compliance samples, a copy of this form will be sent to the North Carolina DEHNR Certification Office (i.e out of hold, incorrect preservative, out of temp, incorrect containers)

Pace Analytical Services, Inc.
602 S 25th Street
Billings, MT 591014549
(406)254-7226

September 09, 2011

Kevin Houck
Herrera Environmental Consultants
101 East Broadway, Suite 610
Missoula, MT 59802

RE: Project: Black Pine Mine
Pace Project No.: 10167132

Dear Kevin Houck:
Enclosed are the analytical results for sample(s) received by the laboratory on August 20, 2011. The results relate only to the samples included in this report.

If you have any questions concerning this report, please feel free to contact me.

Sincerely,

Sally Heinje

sally.heinje@pacelabs.com
Project Manager

Enclosures

cc: Devin Clary, Montana Dept. of Environmental Quality
Mark Donner, Trihydro

REPORT OF LABORATORY ANALYSIS

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602 S 25th Street
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(406)254-7226

CERTIFICATIONS

Project: Black Pine Mine
Pace Project No.: 10167132

Minnesota Certification IDs

1700 Elm Street SE Suite 200, Minneapolis, MN 55414
A2LA Certification #: 2926.01
Alaska Certification #: UST-078
Alaska Certification #MN00064
Arizona Certification #: AZ-0014
Arkansas Certification #: 88-0680
California Certification #: 01155CA
EPA Region 8 Certification #: Pace
Florida/NELAP Certification #: E87605
Georgia Certification #: 959
Idaho Certification #: MN00064
Illinois Certification #: 200011
Iowa Certification #: 368
Kansas Certification #: E-10167
Louisiana Certification #: 03086
Louisiana Certification #: LA080009
Maine Certification #: 2007029
Maryland Certification #: 322
Michigan DEQ Certification #: 9909
Minnesota Certification #: 027-053-137
Mississippi Certification #: Pace
Montana Certification #: MT CERT0092
Nevada Certification #: MN_00064
Nebraska Certification #: Pace
New Jersey Certification #: MN-002
New Mexico Certification #: Pace
New York Certification #: 11647
North Carolina Certification #: 530
North Dakota Certification #: R-036
North Dakota Certification #: R-036A
Ohio VAP Certification #: CL101
Oklahoma Certification #: D9921
Oklahoma Certification #: 9507
Oregon Certification #: MN200001
Pennsylvania Certification #: 68-00563
Puerto Rico Certification
Tennessee Certification #: 02818
Texas Certification #: T104704192
Washington Certification #: C754
Wisconsin Certification #: 999407970

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SAMPLE SUMMARY

Project: Black Pine Mine
Pace Project No.: 10167132

Lab ID	Sample ID	Matrix	Date Collected	Date Received
10167132001	**BP-CMN-SS-17**	Solid	08/18/11 10:00	08/20/11 09:25
10167132002	**BP-CMN-SS-18**	Solid	08/18/11 10:10	08/20/11 09:25
10167132003	**BP-CMN-SS-19**	Solid	08/18/11 10:50	08/20/11 09:25

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SAMPLE ANALYTE COUNT

Project: Black Pine Mine
Pace Project No.: 10167132

Lab ID	Sample ID	Method	Analysts	Analytes Reported	Laboratory
10167132001	**BP-CMN-SS-17**	EPA 6020	TL1	13	PASI-M
		EPA 7471	TEM	1	PASI-M
		% Moisture	JDL	1	PASI-M
10167132002	**BP-CMN-SS-18**	EPA 6020	TL1	12	PASI-M
		EPA 7471	TEM	1	PASI-M
		% Moisture	JDL	1	PASI-M
10167132003	**BP-CMN-SS-19**	EPA 6020	TL1	12	PASI-M
		EPA 7471	TEM	1	PASI-M
		% Moisture	JDL	1	PASI-M

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PROJECT NARRATIVE

Project: Black Pine Mine
Pace Project No.: 10167132

Method: **EPA 6020**
Description: 6020 MET ICPMS
Client: Montana Dept. of Environmental Quality
Date: September 09, 2011

General Information:
3 samples were analyzed for EPA 6020. All samples were received in acceptable condition with any exceptions noted below.

Hold Time:
The samples were analyzed within the method required hold times with any exceptions noted below.

Sample Preparation:
The samples were prepared in accordance with EPA 3050 with any exceptions noted below.

Initial Calibrations (including MS Tune as applicable):
All criteria were within method requirements with any exceptions noted below.

Continuing Calibration:
All criteria were within method requirements with any exceptions noted below.

Internal Standards:
All internal standards were within QC limits with any exceptions noted below.

Method Blank:
All analytes were below the report limit in the method blank with any exceptions noted below.

Laboratory Control Spike:
All laboratory control spike compounds were within QC limits with any exceptions noted below.

Matrix Spikes:
All percent recoveries and relative percent differences (RPDs) were within acceptance criteria with any exceptions noted below.

QC Batch: MPRP/28161

A matrix spike and matrix spike duplicate (MS/MSD) were performed on the following sample(s): 10167132001,10167959003

M6: Matrix spike and Matrix spike duplicate recovery not evaluated against control limits due to sample dilution.

- MS (Lab ID: 1046370)
  - Antimony
  - Arsenic
  - Barium
  - Copper
  - Iron
  - Lead
  - Manganese
  - Zinc
- MS (Lab ID: 1046372)
  - Antimony
  - Barium
  - Iron
  - Zinc

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PROJECT NARRATIVE

Project: Black Pine Mine
Pace Project No.: 10167132

Method: **EPA 6020**
Description: 6020 MET ICPMS
Client: Montana Dept. of Environmental Quality
Date: September 09, 2011

QC Batch: MPRP/28161

A matrix spike and matrix spike duplicate (MS/MSD) were performed on the following sample(s): 10167132001,10167959003

M6: Matrix spike and Matrix spike duplicate recovery not evaluated against control limits due to sample dilution.

- MSD (Lab ID: 1046371)
  - Barium
  - Copper
  - Iron
  - Lead
  - Manganese
  - Zinc

Duplicate Sample:
All duplicate sample results were within method acceptance criteria with any exceptions noted below.

Additional Comments:

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PROJECT NARRATIVE

Project: Black Pine Mine
Pace Project No.: 10167132

Method: **EPA 7471**
Description: 7471 Mercury
Client: Montana Dept. of Environmental Quality
Date: September 09, 2011

General Information:
3 samples were analyzed for EPA 7471. All samples were received in acceptable condition with any exceptions noted below.

Hold Time:
The samples were analyzed within the method required hold times with any exceptions noted below.

Sample Preparation:
The samples were prepared in accordance with EPA 7471 with any exceptions noted below.

Initial Calibrations (including MS Tune as applicable):
All criteria were within method requirements with any exceptions noted below.

Continuing Calibration:
All criteria were within method requirements with any exceptions noted below.

Method Blank:
All analytes were below the report limit in the method blank with any exceptions noted below.

Laboratory Control Spike:
All laboratory control spike compounds were within QC limits with any exceptions noted below.

Matrix Spikes:
All percent recoveries and relative percent differences (RPDs) were within acceptance criteria with any exceptions noted below.

Duplicate Sample:
All duplicate sample results were within method acceptance criteria with any exceptions noted below.

Additional Comments:

This data package has been reviewed for quality and completeness and is approved for release.

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ANALYTICAL RESULTS

Project: Black Pine Mine
Pace Project No.: 10167132

Sample: BP-CMN-SS-17 **Lab ID: 10167132001** Collected: 08/18/11 10:00 Received: 08/20/11 09:25 Matrix: Solid

Results reported on a "wet-weight" basis

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
6020 MET ICPMS	Analytical Method: EPA 6020 Preparation Method: EPA 3050							
Antimony	**12.6**	mg/kg	0.38	20	09/06/11 13:26	09/07/11 21:16	7440-36-0	M6
Arsenic	**14.5**	mg/kg	0.38	20	09/06/11 13:26	09/07/11 21:16	7440-38-2	M6
Barium	**120**	mg/kg	0.23	20	09/06/11 13:26	09/08/11 17:37	7440-39-3	M6
Cadmium	**0.86**	mg/kg	0.062	20	09/06/11 13:26	09/07/11 21:16	7440-43-9	
Chromium	**2.4**	mg/kg	0.38	20	09/06/11 13:26	09/07/11 21:16	7440-47-3	
Copper	**89.8**	mg/kg	0.38	20	09/06/11 13:26	09/07/11 21:16	7440-50-8	M6
Iron	**5160**	mg/kg	38.5	20	09/06/11 13:26	09/07/11 21:16	7439-89-6	M6
Lead	**90.4**	mg/kg	0.077	20	09/06/11 13:26	09/07/11 21:16	7439-92-1	M6
Manganese	**285**	mg/kg	0.38	20	09/06/11 13:26	09/07/11 21:16	7439-96-5	M6
Nickel	**3.2**	mg/kg	0.38	20	09/06/11 13:26	09/07/11 21:16	7440-02-0	
Selenium	**<0.38**	mg/kg	0.38	20	09/06/11 13:26	09/07/11 21:16	7782-49-2	
Silver	**1.6**	mg/kg	0.38	20	09/06/11 13:26	09/08/11 17:37	7440-22-4	
Zinc	**79.4**	mg/kg	3.8	20	09/06/11 13:26	09/08/11 17:37	7440-66-6	M6
7471 Mercury	Analytical Method: EPA 7471 Preparation Method: EPA 7471							
Mercury	**0.041**	mg/kg	0.018	1	09/01/11 10:11	09/02/11 12:09	7439-97-6	
Dry Weight	Analytical Method: % Moisture							
Percent Moisture	**13.1**	%	0.10	1		09/02/11 00:00		

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ANALYTICAL RESULTS

Project: Black Pine Mine
Pace Project No.: 10167132

Sample: BP-CMN-SS-18 **Lab ID: 10167132002** Collected: 08/18/11 10:10 Received: 08/20/11 09:25 Matrix: Solid

Results reported on a "wet-weight" basis

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
6020 MET ICPMS	Analytical Method: EPA 6020 Preparation Method: EPA 3050							
Antimony	**3.6**	mg/kg	0.43	20	09/06/11 13:26	09/07/11 21:24	7440-36-0	
Arsenic	**9.1**	mg/kg	0.43	20	09/06/11 13:26	09/07/11 21:24	7440-38-2	
Barium	**70.1**	mg/kg	0.26	20	09/06/11 13:26	09/08/11 17:41	7440-39-3	
Cadmium	**1.3**	mg/kg	0.068	20	09/06/11 13:26	09/07/11 21:24	7440-43-9	
Chromium	**1.2**	mg/kg	0.43	20	09/06/11 13:26	09/07/11 21:24	7440-47-3	
Copper	**62.8**	mg/kg	0.43	20	09/06/11 13:26	09/07/11 21:24	7440-50-8	
Iron	**6770**	mg/kg	42.6	20	09/06/11 13:26	09/07/11 21:24	7439-89-6	
Lead	**23.0**	mg/kg	0.085	20	09/06/11 13:26	09/07/11 21:24	7439-92-1	
Manganese	**202**	mg/kg	0.43	20	09/06/11 13:26	09/07/11 21:24	7439-96-5	
Nickel	**4.0**	mg/kg	0.43	20	09/06/11 13:26	09/07/11 21:24	7440-02-0	
Silver	**0.50**	mg/kg	0.43	20	09/06/11 13:26	09/08/11 17:41	7440-22-4	
Zinc	**75.5**	mg/kg	4.3	20	09/06/11 13:26	09/08/11 17:41	7440-66-6	
7471 Mercury	Analytical Method: EPA 7471 Preparation Method: EPA 7471							
Mercury	**0.022**	mg/kg	0.018	1	09/01/11 10:11	09/02/11 12:11	7439-97-6	
Dry Weight	Analytical Method: % Moisture							
Percent Moisture	**9.4**	%	0.10	1		09/02/11 00:00		

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ANALYTICAL RESULTS

Project: Black Pine Mine
Pace Project No.: 10167132

Sample: BP-CMN-SS-19 **Lab ID: 10167132003** Collected: 08/18/11 10:50 Received: 08/20/11 09:25 Matrix: Solid

Results reported on a "wet-weight" basis

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
6020 MET ICPMS	Analytical Method: EPA 6020 Preparation Method: EPA 3050							
Antimony	**1010**	mg/kg	1.9	100	09/06/11 13:26	09/07/11 21:35	7440-36-0	
Arsenic	**537**	mg/kg	1.9	100	09/06/11 13:26	09/07/11 21:35	7440-38-2	
Barium	**87.7**	mg/kg	1.2	100	09/06/11 13:26	09/07/11 21:35	7440-39-3	
Cadmium	**67.0**	mg/kg	0.062	20	09/06/11 13:26	09/07/11 21:31	7440-43-9	
Chromium	**<0.38**	mg/kg	0.38	20	09/06/11 13:26	09/07/11 21:31	7440-47-3	
Copper	**56800**	mg/kg	76.9	4000	09/06/11 13:26	09/08/11 17:48	7440-50-8	
Iron	**13600**	mg/kg	38.5	20	09/06/11 13:26	09/07/11 21:31	7439-89-6	
Lead	**1860**	mg/kg	1.5	400	09/06/11 13:26	09/08/11 17:45	7439-92-1	
Manganese	**989**	mg/kg	1.9	100	09/06/11 13:26	09/07/11 21:35	7439-96-5	
Nickel	**6.8**	mg/kg	0.38	20	09/06/11 13:26	09/07/11 21:31	7440-02-0	
Silver	**105**	mg/kg	1.9	100	09/06/11 13:26	09/07/11 21:35	7440-22-4	
Zinc	**4380**	mg/kg	76.9	400	09/06/11 13:26	09/08/11 17:45	7440-66-6	
7471 Mercury	Analytical Method: EPA 7471 Preparation Method: EPA 7471							
Mercury	**1.1**	mg/kg	0.019	1	09/01/11 10:11	09/02/11 12:13	7439-97-6	
Dry Weight	Analytical Method: % Moisture							
Percent Moisture	**8.5**	%	0.10	1		09/02/11 00:00		

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QUALITY CONTROL DATA

Project: Black Pine Mine
Pace Project No.: 10167132

QC Batch: MPRP/28161 Analysis Method: EPA 6020
QC Batch Method: EPA 3050 Analysis Description: 6020 MET
Associated Lab Samples: 10167132001, 10167132002, 10167132003

METHOD BLANK: 1046368 Matrix: Solid
Associated Lab Samples: 10167132001, 10167132002, 10167132003

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Antimony	mg/kg	<0.025	0.025	09/07/11 21:12	
Arsenic	mg/kg	<0.025	0.025	09/07/11 21:12	
Barium	mg/kg	<0.015	0.015	09/07/11 21:12	
Cadmium	mg/kg	<0.0040	0.0040	09/07/11 21:12	
Chromium	mg/kg	<0.025	0.025	09/07/11 21:12	
Copper	mg/kg	<0.025	0.025	09/07/11 21:12	
Iron	mg/kg	<2.5	2.5	09/07/11 21:12	
Lead	mg/kg	<0.0050	0.0050	09/07/11 21:12	
Manganese	mg/kg	<0.025	0.025	09/07/11 21:12	
Nickel	mg/kg	<0.025	0.025	09/07/11 21:12	
Selenium	mg/kg	<0.025	0.025	09/07/11 21:12	
Silver	mg/kg	<0.50	0.50	09/08/11 17:33	
Zinc	mg/kg	<0.25	0.25	09/07/11 21:12	

LABORATORY CONTROL SAMPLE: 1046369

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Antimony	mg/kg	18.2	18.8	104	75-125	
Arsenic	mg/kg	18.2	18.5	102	75-125	
Barium	mg/kg	18.2	16.8	92	75-125	
Cadmium	mg/kg	18.2	16.7	92	75-125	
Chromium	mg/kg	18.2	17.8	98	75-125	
Copper	mg/kg	18.2	20.4	112	75-125	
Iron	mg/kg	227	236	104	75-125	
Lead	mg/kg	18.2	17.3	95	75-125	
Manganese	mg/kg	18.2	17.4	96	75-125	
Nickel	mg/kg	18.2	17.8	98	75-125	
Selenium	mg/kg	18.2	19.8	109	75-125	
Silver	mg/kg	18.2	20.5	113	75-125	
Zinc	mg/kg	18.2	17.4	96	75-125	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 1046370 1046371

Parameter	Units	10167132001 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Antimony	mg/kg	12.6	17.3	17	24.3	27.5	56	76	75-125	13	20	M6
Arsenic	mg/kg	14.5	17.3	17	27.3	32.4	61	92	75-125	17	20	M6
Barium	mg/kg	120	17.3	17	149	116	61	-130	75-125	25	20	D6,M6
Cadmium	mg/kg	0.86	17.3	17	15.3	16.8	83	93	75-125	9	20	
Chromium	mg/kg	2.4	17.3	17	19.2	19.6	95	99	75-125	2	20	

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QUALITY CONTROL DATA

Project: Black Pine Mine
Pace Project No.: 10167132

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 1046370 1046371

Parameter	Units	10167132001 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Copper	mg/kg	89.8	17.3	17	92.3	103	-64	.1	75-125	11	20	M6
Iron	mg/kg	5160	216	213	4830	4950	-513	-465	75-125	2	20	M6
Lead	mg/kg	90.4	17.3	17	111	109	37	28	75-125	2	20	M6
Manganese	mg/kg	285	17.3	17	397	231	402	-568	75-125	53	20	D6,M6
Nickel	mg/kg	3.2	17.3	17	18.5	19.7	85	94	75-125	6	20	
Selenium	mg/kg	<0.38	17.3	17	16.8	18.0	95	104	75-125	7	20	
Silver	mg/kg	1.6	17.3	17	21.5	22.6	113	122	75-125	5	20	
Zinc	mg/kg	79.4	17.3	17	90.0	93.2	-8	11	75-125	3	20	M6

MATRIX SPIKE SAMPLE: 1046372

Parameter	Units	10167959003 Result	Spike Conc.	MS Result	MS % Rec	% Rec Limits	Qualifiers
Antimony	mg/kg	0.25J	21.3	8.5	38	75-125	M6
Arsenic	mg/kg	9.1	21.3	30.0	98	75-125	
Barium	mg/kg	287	21.3	341	251	75-125	M6
Cadmium	mg/kg	0.28	21.3	19.1	88	75-125	
Chromium	mg/kg	28.9	21.3	48.8	93	75-125	
Copper	mg/kg	20.7	21.3	42.1	101	75-125	
Iron	mg/kg	21800	267	27000	1940	75-125	M6
Lead	mg/kg	12.3	21.3	30.9	87	75-125	
Manganese	mg/kg	364	21.3	390	122	75-125	
Nickel	mg/kg	22.1	21.3	43.9	103	75-125	
Selenium	mg/kg	1.2	21.3	20.6	91	75-125	
Silver	mg/kg	0.20J	21.3	22.6	105	75-125	
Zinc	mg/kg	68.0	21.3	94.9	127	75-125	M6

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QUALITY CONTROL DATA

Project: Black Pine Mine
Pace Project No.: 10167132

QC Batch: MERP/5886 Analysis Method: EPA 7471
QC Batch Method: EPA 7471 Analysis Description: 7471 Mercury
Associated Lab Samples: 10167132001, 10167132002, 10167132003

METHOD BLANK: 1042081 Matrix: Solid
Associated Lab Samples: 10167132001, 10167132002, 10167132003

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Mercury	mg/kg	<0.019	0.019	09/02/11 11:24	

LABORATORY CONTROL SAMPLE: 1042082

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Mercury	mg/kg	.5	0.51	101	80-120	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 1042083 1042084

Parameter	Units	10167352031 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Mercury	mg/kg	0.17	.44	.45	0.62	0.63	102	102	80-120	2	20	

MATRIX SPIKE SAMPLE: 1042085

Parameter	Units	10167633001 Result	Spike Conc.	MS Result	MS % Rec	% Rec Limits	Qualifiers
Mercury	mg/kg	0.029	.6	0.61	97	80-120	

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QUALITY CONTROL DATA

Project: Black Pine Mine
Pace Project No.: 10167132

QC Batch: MPRP/28202 Analysis Method: % Moisture
QC Batch Method: % Moisture Analysis Description: Dry Weight/Percent Moisture
Associated Lab Samples: 10167132001, 10167132002, 10167132003

SAMPLE DUPLICATE: 1047722

Parameter	Units	10167441004 Result	Dup Result	RPD	Max RPD	Qualifiers
Percent Moisture	%	14.5	14.9	3	30	

SAMPLE DUPLICATE: 1047723

Parameter	Units	10167644011 Result	Dup Result	RPD	Max RPD	Qualifiers
Percent Moisture	%	7.3	7.1	3	30	

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QUALIFIERS

Project: Black Pine Mine
Pace Project No.: 10167132

DEFINITIONS

DF - Dilution Factor, if reported, represents the factor applied to the reported data due to changes in sample preparation, dilution of the sample aliquot, or moisture content.

ND - Not Detected at or above adjusted reporting limit.

J - Estimated concentration above the adjusted method detection limit and below the adjusted reporting limit.

MDL - Adjusted Method Detection Limit.

S - Surrogate

1,2-Diphenylhydrazine (8270 listed analyte) decomposes to Azobenzene.

Consistent with EPA guidelines, unrounded data are displayed and have been used to calculate % recovery and RPD values.

LCS(D) - Laboratory Control Sample (Duplicate)

MS(D) - Matrix Spike (Duplicate)

DUP - Sample Duplicate

RPD - Relative Percent Difference

NC - Not Calculable.

SG - Silica Gel - Clean-Up

U - Indicates the compound was analyzed for, but not detected.

N-Nitrosodiphenylamine decomposes and cannot be separated from Diphenylamine using Method 8270. The result reported for each analyte is a combined concentration.

LABORATORIES

PASI-M	Pace Analytical Services - Minneapolis

ANALYTE QUALIFIERS

D6	The relative percent difference (RPD) between the sample and sample duplicate exceeded laboratory control limits.
M6	Matrix spike and Matrix spike duplicate recovery not evaluated against control limits due to sample dilution.

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Pace Analytical Services, Inc.
602 S 25th Street
Billings, MT 591014549
(406)254-7226

QUALITY CONTROL DATA CROSS REFERENCE TABLE

Project: Black Pine Mine
Pace Project No.: 10167132

Lab ID	Sample ID	QC Batch Method	QC Batch	Analytical Method	Analytical Batch
10167132001	**BP-CMN-SS-17**	EPA 3050	MPRP/28161	EPA 6020	ICPM/11420
10167132002	**BP-CMN-SS-18**	EPA 3050	MPRP/28161	EPA 6020	ICPM/11420
10167132003	**BP-CMN-SS-19**	EPA 3050	MPRP/28161	EPA 6020	ICPM/11420
10167132001	**BP-CMN-SS-17**	EPA 7471	MERP/5886	EPA 7471	MERC/6712
10167132002	**BP-CMN-SS-18**	EPA 7471	MERP/5886	EPA 7471	MERC/6712
10167132003	**BP-CMN-SS-19**	EPA 7471	MERP/5886	EPA 7471	MERC/6712
10167132001	**BP-CMN-SS-17**	% Moisture	MPRP/28202		
10167132002	**BP-CMN-SS-18**	% Moisture	MPRP/28202		
10167132003	**BP-CMN-SS-19**	% Moisture	MPRP/28202		

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CHAIN-OF-CUSTODY / Analytical Request Document

The Chain-of-Custody is a LEGAL DOCUMENT. All relevant fields must be completed accurately.

L0167[52

Page: of 1509806

Section A Required Client Information:

Company: HERRERA
Address: 101 E BROADWAY, 610
Missoula, MT 59802
Email To: khouck@herrerainc.com
Phone: 406-721-4204 Fax:
Requested Due Date/TAT:

Section B Required Project Information:

Report To: Kevin Houck
Copy To: Devin Clary / Mark Donner
Purchase Order No.:
Project Name: Black Pine Mine
Project Number:

Section C Invoice Information:

Attention: Devin Clary
Company Name:
Address:
Pace Quote Reference:
Pace Project Manager:
Pace Profile #:

REGULATORY AGENCY
☐ NPDES ☐ GROUND WATER ☐ DRINKING WATER
☐ UST ☐ RCRA ☐ OTHER
Site Location STATE:

Section D Required Client Information

Matrix Codes (MATRIX / CODE): Drinking Water DW; Water WT; Waste Water WW; Product P; Soil/Solid SL; Oil OL; Wipe WP; Air AR; Tissue TS; Other OT

ITEM #	SAMPLE ID (A-Z, 0-9 / ,-) Sample IDs MUST BE UNIQUE	MATRIX CODE (see valid codes to left)	SAMPLE TYPE (G=GRAB C=COMP)	COLLECTED GRAB / COMPOSITE START DATE	COLLECTED GRAB / COMPOSITE START TIME	COMPOSITE END/GRAB DATE	COMPOSITE END/GRAB TIME	SAMPLE TEMP AT COLLECTION	# OF CONTAINERS	Preservatives: Unpreserved	H_2SO_4	HNO_3	HCl	NaOH	$Na_2S_2O_3$	Methanol	Other	Analysis Test Y/N	Requested Analysis Filtered (Y/N): Total Metals	Residual Chlorine (Y/N)	Pace Project No./ Lab I.D.
1	BP-CMN-SS-17	S	G	8-18-11	1000			1										X	X		001
2	BP-CMN-SS-18	S	G	1	1010			1										X	X		002
3	BP-CMN-SS-19	S	G	1	1050			1										X	X		003
4																					
5																					
6																					
7																					
8																					
9																					
10																					
11																					
12																					

ADDITIONAL COMMENTS	RELINQUISHED BY / AFFILIATION	DATE	TIME	ACCEPTED BY / AFFILIATION	DATE	TIME	SAMPLE CONDITIONS			
	HLC	8-19-11	1203	Pace	8-20-11	925	6.0	Y	Y	Y
	PACE	8-19-11	1203							

2

SAMPLER NAME AND SIGNATURE
PRINT Name of SAMPLER:
SIGNATURE of SAMPLER: DATE Signed (MM/DD/YY):

Temp in °C | Received on Ice (Y/N) | Custody Sealed Cooler (Y/N) | Samples Intact (Y/N)

*Important Note: By signing this form you are accepting Pace's NET 30 day payment terms and agreeing to late charges of 1.5% per month for any invoices not paid within 30 days.

F-ALL-Q-020rev.07, 15-May-2007

Pace Analytical	Document Name: Sample Condition Upon Receipt Form	Revised Date: 02Jun2011 Page 1 of 1
	Document Number: F-L-213 Rev.01	Issuing Authority: Pace Minnesota Quality Office

Sample Condition Upon Receipt

Client Name: Herrera **Project #** lot 67132

Courier: [X] Fed Ex [ ] UPS [ ] USPS [ ] Client [ ] Commercial [ ] Pace [ ] Other _____

Tracking #: 875397529319

Custody Seal on Cooler/Box Present: [X] yes [ ] no **Seals intact:** [X] yes [ ] no

Packing Material: [ ] Bubble Wrap [X] Bubble Bags [ ] None [ ] Other _____ **Temp Blank:** Yes ____ No X

Thermometer Used 80344042 or 80512447 **Type of Ice:** (Wet) Blue None [ ] Samples on ice, cooling process has begun

Cooler Temperature 6.0 **Biological Tissue is Frozen:** Yes No **Date and initials of person examining contents:** 8-20-11 MB

Temp should be above freezing to 6°C **Comments:**

Chain of Custody Present:	[X]Yes [ ]No [ ]N/A	1.
Chain of Custody Filled Out:	[X]Yes [ ]No [ ]N/A	2.
Chain of Custody Relinquished:	[X]Yes [ ]No [ ]N/A	3.
Sampler Name & Signature on COC:	[ ]Yes [X]No [ ]N/A	4.
Samples Arrived within Hold Time:	[X]Yes [ ]No [ ]N/A	5.
Short Hold Time Analysis (<72hr):	[ ]Yes [X]No [ ]N/A	6.
Rush Turn Around Time Requested:	[ ]Yes [X]No [ ]N/A	7.
Sufficient Volume:	[X]Yes [ ]No [ ]N/A	8.
Correct Containers Used:	[X]Yes [ ]No [ ]N/A	9.
-Pace Containers Used:	[X]Yes [ ]No [ ]N/A	
Containers Intact:	[X]Yes [ ]No [ ]N/A	10.
Filtered volume received for Dissolved tests	[ ]Yes [ ]No [X]N/A	11.
Sample Labels match COC: -Includes date/time/ID/Analysis Matrix: SL	[X]Yes [ ]No [ ]N/A	12.
All containers needing acid/base preservation have been checked. Noncompliance are noted in 13.	[ ]Yes [ ]No [X]N/A	13. [ ] HNO3 [ ] H2SO4 [ ] NaOH [ ] HCl Samp #
All containers needing preservation are found to be in compliance with EPA recommendation.	[ ]Yes [ ]No [X]N/A	
Exceptions: VOA,Coliform, TOC, Oil and Grease, WI-DRO (water)	[ ]Yes [X]No	Initial when completed / Lot # of added preservative
Samples checked for dechlorination:	[ ]Yes [ ]No [X]N/A	14.
Headspace in VOA Vials (>6mm):	[ ]Yes [ ]No [X]N/A	15.
Trip Blank Present:	[ ]Yes [ ]No [X]N/A	16.
Trip Blank Custody Seals Present	[ ]Yes [ ]No [X]N/A	
Pace Trip Blank Lot # (If purchased):		

Client Notification/ Resolution: **Field Data Required?** Y / N

Person Contacted: _____ Date/Time: _____

Comments/ Resolution: _____

Project Manager Review: _____ **Date:** 8/22/11

Note: Whenever there is a discrepancy affecting North Carolina compliance samples, a copy of this form will be sent to the North Carolina DEHNR Certification Office (i.e out of hold, incorrect preservative, out of temp, incorrect containers)

APPENDIX D

DATA VALIDATION REPORTS

EXECUTIVE SUMMARY
RECLAMATION INVESTIGATION REPORT DATA VALIDATION
BLACK PINE MINE
GRANITE COUNTY, MONTANA

Herrera Environmental Consultants (Herrera) performed a reclamation investigation in association with Trihydro Corporation (Trihydro) and collected soil, mine tailing, sediment, and water samples at the Black Pine Mine between May and August 2011. Trihydro performed data validation reviews on the reclamation investigation analytical data after receiving this data from Pace Analytical Services, Inc. (Pace).

The laboratory reported the analytical results in 21 data sets. A total of 168 soil, sediment, and tailings samples; 44 surface water and groundwater samples; 1 aqueous rinsate sample; and 4 field duplicate samples were collected and submitted for analytical testing, corresponding to 4153 data points. In addition, 49 samples were collected from potentially hazardous materials and 1 additional soil sample was collected and analyzed for geotechnical properties only. Validation was not performed on these 50 samples. Data from the 217 analytical samples were reviewed using Trihydro's Tier II data validation review process. The individual data validation reports, organized by work order number, are included as Attachment A to this Executive Summary.

Pace data sets included in this review are: 10156716, 10158290, 10160655, 10160673, 10160707, 10160756, 10163246, 10163437, 10163483, 10163606, 10163633, 10163634, 10163635, 10163640, 10163643, 10163644, 10163645, 10166973, 10167132, 10160851, and 10160853. The latter two data sets included analytical data for low-level Mercury associated with sample locations covered within other data sets. Therefore the evaluation of the low-level Mercury data is included with the evaluation of the other data sets.

The samples were analyzed by one or more of the following methods:

- Total Recoverable Metals by United States Environmental Protection Agency (USEPA) Solid Waste 846 (SW-846) Methods 6010B and 6020 (Solid Matrix Samples)
- Total Recoverable and Dissolved Metals by USEPA Method 200.8 (Aqueous Matrix Samples)
- Total Recoverable and low-level Mercury by USEPA SW-846 Methods 7471A (Solid Matrix Samples) and 7470A (Aqueous Matrix Samples)
- Total Solids/Percent Moisture Analysis by SW-846 Methodology (Solid Matrix Samples)

- Acid Base Accounting (SMP Buffer pH, Extractable Sulfur, Acid Base Potential, and Lime Requirement) by Modified Sobek 3.2
- pH, Saturated Paste by American Society of Agronomy (ASA) 10-3.2
- Specific Conductance Saturated Paste by ASA 10-3.3
- Available Phosphorous by ASA 24-5.4 and Standard Methods (SM) 4500P-E
- Organic Matter by ASA 29-3.5.2
- Available Nitrate by ASA 33-3.2 and EPA 353.2
- Coarse Fragment by ASTM D421
- Potassium by Contract Laboratory Program (CLP) Inductively Coupled Plasma (ICP) Atomic Emission Spectroscopy (AES) Montana Department of Environmental Quality (MDEQ) Methodology, or by USEPA 200.8
- Cation Exchange Capacity by USEPA 9081
- Acidity by Standard Method (SM) 2310
- Total Suspended Solids (TSS) by SM 2540D
- Sulfate by USEPA Method 300.0 IC Anions
- Alkalinity, Total as $CaCO_3$ by SM2320B
- Total Hardness by SM 2340 B
- Total Dissolved Solids (TDS) by SM 2540C

OVERALL ASSESSMENT OF DATA

The validation process assesses data for precision, accuracy, method compliance, and completeness. Data were determined to have acceptable quality for use in site characterization. However, some data were assigned J or UJ data flags (indicating estimated concentrations or estimated to be below the reporting limits, respectively) due to potential biases. For data assigned J or UJ data flags, the reasons for qualification should be given consideration when interpreting sample concentrations. One data point for mercury in sample CMN-SS-08-03 (collected at 3-5 feet below ground surface) was rejected (qualified as R) due to an extremely low matrix spike recovery. Sample analyses were performed as requested, with the exceptions of some CoC discrepancies that are discussed within this review.

Qualified data and reasons for data qualification are summarized in the following sections of this executive summary, and tables summarizing the qualified data are included at the end of each data validation report (Attachment A). In addition, statements addressing usability of the data are underlined for emphasis in this executive summary.

VALIDATION PROCESS

Organic analysis data were evaluated in general accordance with validation criteria set forth in the United States Environmental Protection Agency (USEPA) CLP *National Functional Guidelines for Superfund Organic Methods Data Review*, document number USEPA-540-R-08-01, June 2008; with additional reference to the USEPA CLP *National Functional Guidelines for Organic Data Review*, document number EPA 540/R-99-008, October 1999. Data for inorganic analyses were evaluated in general accordance with validation criteria set forth in the USEPA CLP *National Functional Guidelines for Inorganic Superfund Data Review*, document number EPA 540R-10-011, January 2010. Review of duplicates is conducted in accordance with USEPA Region 1 *Laboratory Data Validation Functional Guidelines for Evaluation of Organic Analysis*, December 1996 or as specified by the method (as applicable). Additionally, data were evaluated in accordance with requirements in the Reclamation Work Plan for Black Pine Mine (Work Plan).

PRECISION ASSESSMENT

Precision is the measure of variability of sample measurements. Laboratory precision is determined by examining the laboratory duplicate results with the parent sample results, the laboratory control sample (LCS) results with the laboratory control sample duplicate (LCSD) results, and/or the matrix spike (MS) results with the matrix spike duplicate (MSD) results, when available. Field precision is determined by comparing field duplicate sample results with the result for the parent sample. Evaluation of both the laboratory and field duplicates for precision was accomplished using the calculated relative percent difference (RPD) value. The RPD is defined as the difference between the primary and duplicate samples divided by the mean of the primary and duplicate samples, which is then expressed as a percentage.

Laboratory precision was determined for these data based on the MS/MSD, LCS/LCSD, and/or laboratory sample duplicate RPD calculations. Several high RPD values resulted in assignment of J or UJ data qualifiers in these data. A total of 112 data points required qualification as a result of laboratory precision measures. However, the data are acceptable for use in site characterization.

Field precision was determined by comparing field duplicate sample results with parent sample results. Field duplicates are collected to review laboratory and field repeatability. The Work Plan requires one groundwater and two surface water duplicate samples to be collected to evaluate the reproducibility of laboratory analytical and field sampling procedures. Three surface water samples (CML-SW-15, CML-SW-02, and CPS-11) and one groundwater sample (CMMW-1) duplicate samples were collected; therefore, field duplicates were collected in accordance with Work Plan requirements. The field duplicate RPD limits of 0-30% specified in data validation guidelines were used as the data validation quality control (QC) limits (as stated in the USEPA Region 1 *Laboratory Data Validation Functional Guidelines for Evaluation of Organic Analysis*). If the RPD value was greater than 30%, the parent and duplicate sample results were qualified as J. In some cases, where the RPD values were determined by the data validator to be high, all samples associated with that field duplicate sample pair were qualified as J or as UJ. Also, if an analyte in one sample was detected while in the other sample was non-detect and if the detected result was greater than two times the laboratory reporting limit, the analyte in the parent and duplicate samples were qualified as J or as UJ. The duplicate sample locations and their associated parent samples are summarized in Table 1, below.

TABLE 1. FIELD DUPLICATE AND PARENT SAMPLES

Parent Sample	Field Duplicate	Work Order Number
CML-SW-02	CML-Q1-T2	10160756
CML-SW-15	CML-Q1-T1	10160655
CPS-11	BD-1	10158290
CMMW-1	FIELD DUPLICATE	10156716

Most field duplicate RPD results were within the data validation QC limits. However, approximately 41 data points (of a total of 702 data points that are associated with these field duplicate sample pairs) were qualified as J or UJ as a result of field duplicate RPD values that were outside data validation QC limits. Based on the evaluation, the data are acceptable for use in site characterization.

ACCURACY ASSESSMENT

Accuracy is a measure of sampling and analytical system bias. Field accuracy is determined during data validation by reviewing results of the equipment blank samples collected with the project samples for evidence of sample contamination stemming from field activities or sample transport. The Work Plan requires one equipment rinsate sample to be collected from field equipment and submitted for total recoverable metals analysis. Stainless steel bowls and spoons were used for field sampling and one equipment rinsate sample, QC-WT-T1, was collected from a bowl and

spoon. This equipment rinsate sample was submitted to the laboratory for total recoverable metals analyses. Lead was detected in the rinsate sample at 0.47 µg/L. A total of 14 data points were qualified as JB across all data sets since lead was detected in the environmental samples within 10 times the rinsate sample detection. An additional 7 data points were qualified as U since the environmental samples were detected at less than the blank detection.

Laboratory accuracy was measured by evaluating LCS/LCSD and MS/MSD percent recoveries. The LCS/LCSD and MS/MSD recoveries were compared to data validation or laboratory QC limits. The total number of LCS/LCSD and MS/MSD samples analyzed was within method requirements for laboratory quality control samples.

The LCS/LCSD recovery data were within laboratory or data validation QC limits, with the exception one high-biased LCS recovery for total potassium. Several MS/MSD recoveries were outside of laboratory or data validation QC limits, and data were qualified as J or as UJ due to possible high or low biases. A total of 434 data points were qualified as J or as UJ due to out-of-specification MS/MSD or LCS/LCSD recoveries. Additionally, one data point for mercury in sample CMN-SS-08-03 required rejection due to a failed MS/MSD recovery and was assigned an R data qualifier. With the exception of the rejected data point, the data are acceptable for use in site characterization.

METHOD COMPLIANCE AND INSTRUMENT PERFORMANCE

Method compliance and instrument performance were established by evaluating instrument calibration non-conformances, holding times, dilutions, and method blanks with respect to method and data validation specific requirements. The criteria for data quality objectives were met for method compliance and instrument performance.

Holding Times: Data Set 10156716: The laboratory noted that analysis for one laboratory duplicate in the analysis of TDS had initially been performed within method holding time, but the resulting RPD was outside laboratory QC criteria. The laboratory duplicate was re-analyzed outside method holding time and the RPD was within laboratory requirements. Since the re-analysis demonstrated acceptable precision the data validator determined that no further action was appropriate.

Dilutions: Dilutions were required for the analyses of several samples due to sample concentration or sample matrix interferences. The dilutions were reviewed and were determined to be acceptable for evaluation of laboratory data quality.

Method Blanks: Laboratory blanks were reported as required by the respective analytical methods. Method blanks were not reported nor were required for the moisture and pH analyses. Lead and iron were detected in the method blanks for several Method 6020 batches. Lead and iron were not qualified in the associated

samples based on the method blank detections since the results were greater than 10 times the amounts in the method blanks.

COMPLETENESS

Completeness is the overall ratio of the number of samples planned versus the number of samples with valid analyses and included a review of the CoC and laboratory analytical methods. With the exceptions noted after this paragraph, the laboratory analytical methods were performed according to method and as requested in the CoCs, and the CoC records from field to laboratory were complete. Additionally, custody was maintained as evidenced by field and laboratory personnel signatures, dates, and times of receipt, with the exceptions noted below.

Data Set 10163634: Analysis of specific conductance of saturated paste by ASA 10-3.3 was requested for sample CMN-SS-07-00, but was not performed. The laboratory stated in email correspondence that the analysis was not performed due to insufficient sample volume available for analysis. Therefore, this analyte was not reported for the sample.

Data Set 10163635: Analyses by modified Sobek 3.2 were requested for samples CMN-SS-15 and CMN-SS-16; however, the laboratory did not receive containers for this analysis and the number of sample containers noted in the CoC was not sufficient to include this analysis. The laboratory noted that the project team was contacted concerning this issue. Data for Sobek 3.2 were not reported for these two samples.

Data Set 10167132: The laboratory reported selenium for sample CMN-SS-17 but did not report selenium for the other samples in this set, CMN-SS-18 and CMN-SS-19. The laboratory was contacted, and it was determined that selenium analysis was not required for these samples and was reported in error for sample PB-CMN-SS-17. No further action was required.

Data Set 10163483: Analysis by modified Sobek 3.2 was not requested for sample HM-SS-15-00; however, sample volume intended for this analysis was received for the sample. The laboratory performed the modified Sobek 3.2 analysis on this sample. No further action was taken during data validation since required analyses were performed on the samples.

Completeness also includes a review of the analytical reports and quality control summary report. A total of 588 data points were qualified as J or as UJ based on these data validation reviews. Additionally, 21 data points were qualified as JB or U. One data point was rejected during data validation, and one data point was not reported since there was insufficient sample for the laboratory to perform the analysis. All requested analyses were reported for the samples. The Work Plan requires that the percentage of useable sample data points be equal to at least 90% of the total number

of data points expected from the planned sample analyses. The completeness of the data validated was measured to be 99.99% and is well above the minimum criteria of 90%.

ATTACHMENT A

DATA VALIDATION REPORTS

ATTACHMENT A-1

DATA VALIDATION REPORT FOR DATA SET 10156716

Tier II Data Validation Report Summary

Client: Herrera Environmental Consultants	Laboratory: Pace Analytical Services, Inc. – Billings, MT
Project Name: Black Pine Mine Reclamation Phase	Sample Matrix: Water
Project Number: 776-012-002	Sample Start Date: 05/05/2011
Date Validated: 09/05/2011	Sample End Date: 05/05/2011
Parameters Included: Dissolved Metals (As, Cd, Ca, Cu, Fe, Pb, Mg, Mn, K, Na, and Zn) by United States Environmental Protections Agency (USEPA) Method 200.8, Total Suspended Solids (TSS) by Standard Methods (SM) 2540D, Sulfate by USEPA Method 300.0, Alkalinity by SM 2320B, and Total Dissolved Solids (TDS) by SM 2540C	
Laboratory Project ID: 10156716	
Data Validator: Justin Hildenbrand, Environmental Chemist	

DATA EVALUATION CRITERIA SUMMARY

A Tier II Data Validation was performed by Trihydro's Chemical Data Evaluation Services Group on the analytical data report package generated by Pace Analytical Services, Inc., in Billings, MT, evaluating samples from the Black Pine Mine site, located in Granite, Montana.

Precision, accuracy, method compliance, and completeness of this data package were assessed during this data review. Precision was determined by evaluating the calculated relative percent difference (RPD) values of samples from field duplicate pairs and laboratory duplicate pairs. Laboratory accuracy was established by reviewing the demonstrated percent recoveries of matrix spike (MS) and matrix spike duplicate (MSD) samples, and of laboratory control samples (LCS) to verify that data are not biased. Method compliance was established by reviewing holding times, detection limits, surrogate recoveries, method blanks, and the LCS percent recoveries against method-specific requirements. Completeness was evaluated by determining the overall ratio of the number of samples planned versus the number of samples with valid analyses. Determination of completeness included a review of the chain-of-custody (CoC), laboratory analytical methods, and other necessary documents associated with this analytical data set.

Data were evaluated in general accordance with validation criteria set forth in the United States Environmental Protection Agency (USEPA) Contract Laboratory Program (CLP) National Functional Guidelines for Inorganic Superfund Data Review, document number EPA 540R-10-011, January 2010. Review of duplicates is conducted in accordance with USEPA Region 1 Laboratory Data Validation Functional Guidelines for Evaluation of Organic Analysis, December 1996 or as specified by the method (as applicable).

Tier II Data Validation Report Summary

SAMPLE NUMBERS TABLE

Client Sample ID	Laboratory Sample Number
CMMW-1	10156716-001
CMMW-2	10156716-002
CMMW-3	10156716-003
CMMW-4	10156716-004
CMMW-5	10156716-005
CMMW-6	10156716-006
CMMW-7	10156716-007
CMMW-8	10156716-008
CMMW-9	10156716-009
FIELD DUPLICATE	10156716-010

Tier II Data Validation Report Summary

The samples were analyzed for the required analytes. Assessment of CoC completeness is included in Section #3. The laboratory data were reviewed to evaluate compliance with the required methods and the quality of the reported data. A leading check mark (✓) indicates that the referenced validation criteria were deemed acceptable. A preceding crossed circle (⊗) indicates validation criteria for which the data may have been qualified by the data validator. Details are noted in the tables below.

Validation Criteria

- ✓ Data Completeness
- ✓ CoC Documentation
- ✓ Holding Times and Preservation
- ✓ Laboratory Blanks
- ✓ LCS/LCSDs
- ✓ MS/MSDs
- ✓ Laboratory Duplicates
- ⊗ Field Duplicates
- ✓ Equipment Rinsate

OVERALL DATA PACKAGE ASSESSMENT

Based on a data validation review, the data are acceptable as delivered; exceptions (i.e., rejected data) are noted below. Data qualified by the laboratory are discussed in Section #2.

The purpose of validating data and assigning qualifiers is to assist in proper data interpretation. Data which are not qualified meet the site data quality objectives. If values are assigned qualifiers other than an R (rejected, data not usable), the data may be used for site evaluation, with the reasons for qualification being given consideration when interpreting sample concentrations. Data points which are assigned an R qualifier should not be used for site evaluation purposes. Text identified in **bold font** indicates that further action and/or qualification of the data were required. Data were qualified with J data flags by the laboratory if the result was greater than or equal to the method detection limit (MDL) but less than the reporting limit (RL). Laboratory J flags were preserved in the data and included in the Data Qualification Summary table at the end of this report. Additional data validation qualifiers were added for the items noted with crossed circles, above. Please see the Data Qualification Summary table at the end of this report for a complete list of samples and analytes qualified.

Data qualifiers used during this validation included:

J – Estimated concentration

UJ – Estimated reporting limit

Data Completeness

The analyses were performed as requested on the CoC records. The associated samples were received by the laboratory and analyzed properly. No data points were rejected. The completeness of the data validated was measured to be 100%.

VALIDATION CRITERIA CHECKLIST	
1. Was the report free of non-conformances related to the analytical data identified by the laboratory?	No
Comments: The laboratory noted the following non-conformances related to the analytical data. 200.8: All MS and MSD percent recoveries and RPDs were within acceptance criteria with any exceptions noted below. Quality control (QC) Batch: MPRP/26002 M1: Matrix spike recovery exceeded QC limits. Batch accepted based on LCS recovery. M6: Matrix spike and Matrix spike duplicate recovery not evaluated against control limits due to sample dilution. QC Batch: MPRP/26002 M6: Matrix spike and Matrix spike duplicate recovery not evaluated against control limits due to sample dilution. Additional Comments QC Batch: MPRP/26002 E: Analyte concentration exceeded the calibration range. The reported result is estimated. 2320B: All MS and MSD percent recoveries and RPDs were within acceptance criteria with any exceptions noted below. QC Batch: WET/22267: M1: Matrix spike recovery exceeded QC limits. Batch accepted based on LCS recovery. 2540C: All laboratory duplicate sample results were within method acceptance criteria with any exceptions noted below. QC Batch: WET/22274 1M: Duplicate was analyzed out of hold for confirmation of failing RPD results of original analysis conducted within hold. Upon reanalysis the results were confirmed to original parent sample results; including passing RPD recovery. Results have been flagged and reported accordingly.	
2. Were data qualification flags or other notes used by the laboratory? If yes, define.	Yes
Comments: The following data qualifiers were applied to the sample data by the laboratory. M1 – Matrix spike recovery exceeded QC limits. Batch accepted based on the LCS recovery. M6 – Matrix spike and Matrix spike duplicate recovery not evaluated against control limits due to sample dilution. The following data qualifiers were applied to the QC data by the laboratory. 1M – Duplicate was analyzed out of hold for confirmation of failing RPD results of original analysis conducted within hold. Upon reanalysis the results were confirmed to original parent sample results; including passing RPD recovery. Results have been flagged and reported accordingly. E – Analyte concentration exceeded the calibration range. The reported result is estimated.	
3. Were sample CoC forms complete?	Yes
Comments: The CoC records from field to laboratory were complete, and custody was maintained as evidenced by field and laboratory personnel signatures, dates, and times of receipt.	
4. Were detection limits in accordance with the quality assurance project plan (QAPP), permit, or method, or indicated as acceptable?	Yes
Comments: Dilutions were applied for several analyses in this sample set. 200.8: The samples required dilutions of 5 to 100 times for the dissolved metals analyses. 300.0: The samples required dilutions of 2 to 50 times for the dissolved metals analyses. The dilutions were reviewed and were determined to be acceptable for evaluation of laboratory data quality.	

VALIDATION CRITERIA CHECKLIST

5. Were the requested analytical methods in compliance with the QAPP, permit, or CoC? Yes

Comments: The reported analytical methods were in compliance with those requested on the CoC and with those listed in Table 3 of the Sample Analysis Plan (SAP).

6. Were samples received in good condition within method specified requirements? Yes

Comments: Samples were received on ice, in good condition, with the cooler temperature within the recommended temperature range of 4°C +/- 2°C at 2.4°C as noted on the cooler receipt. The sample containers were reported to be intact.

7. Were samples analyzed within method specified or technical holding times? No

Comments: Samples were extracted and analyzed within method specified holding times, with the following exception.

The laboratory noted that analysis for one laboratory duplicate in the analysis of TDS had initially been performed within method holding time, but the resulting RPD was outside laboratory QC criteria. The laboratory duplicate was re-analyzed outside method holding time and the RPD was within laboratory requirements. Since the re-analysis demonstrated acceptable precision the data validator determined that no further action was necessary based on professional judgment.

8. Were reported units appropriate for the sample matrix/matrices and method(s) of analyses? Yes

Comments: Data were reported in units of mg/L and µg/L, which are appropriate for the requested analyses and for the aqueous matrix.

9. Do the laboratory reports include all constituents requested to be reported? Yes

Comments: Reported constituents were in accordance with the CoC.

10. Was there indication from the laboratory that the initial or continuing calibration verification results were within acceptable limits? Yes

Comments: The laboratory did not note any non-conformances for the initial and continuing calibration verifications. In addition, reported initial calibration verification results were within acceptable laboratory QC and method limits.

11. Was the total number of laboratory blank samples prepared equal to at least 5% of the total number of samples, or analyzed as required by the method? Yes

Comments: The total number of laboratory blank samples was equal to at least 5% of the total number of samples for each analysis and batch.

12. Were laboratory blank samples free of analyte contamination? Yes

Comments: The method blank samples were reported to be free of analyte contamination.

13. Was the total number of matrix spike samples prepared equal to at least 5% of the total number of samples, or analyzed as required by the method? Yes

Comments: The total number of MS/MSD samples was equal to at least 5% of the total number of samples for each analysis and batch, with the exceptions of analyses of TDS by SM 2540D and TSS by SM 2540C. These methods were evaluated based on other QC criteria.

The project samples used to prepare the MS and MSD samples are summarized in the table below.

Analysis	Batch	Parent Sample
E200.8	MPRP/26002	CMMW-5
EPA 300.0	MT/5963	CMMW-1
SM 2320B	WET/22267	CMMW-6

Additional MS/MSDs were prepared for each batch from samples not associated with this sample event.

VALIDATION CRITERIA CHECKLIST	
14. Were MS/MSD percent recoveries and MS/MSD RPDs within data validation or laboratory QC limits?	No
Comments: The MS/MSD percent recoveries and RPD data for project samples were within laboratory QC limits, were not evaluated due to sample dilution, or were not evaluated since the amount spiked was less than four times the amount of analyte measured to be in the original sample. Some MS/MSD data for non-project samples were outside of laboratory or data validation QC limits. These MS/MSDs were considered, but no data were qualified since the matrix similarity to project samples could not be verified.	
15. Was the total number of LCSs analyzed equal to at least 5% of the total number of samples, or analyzed as required by the method?	Yes
Comments: The total number of LCSs was equal to at least 5% of the total number of samples.	
16. Were LCS/LCSD percent recoveries and LCS/LCSD RPDs within data validation or laboratory QC limits?	Yes
Comments: The LCS/LCSD percent recoveries and RPD values were within laboratory QC limits.	
17. Were surrogate recoveries within laboratory QC limits?	N/A
Comments: Surrogates are not required for the reported methods.	
18. Was the number of equipment, trip, or field blanks collected compliant with the project guidelines, quality assurance project plan (QAPP), sample analysis plan (SAP), or permit?	No
Comments: Equipment, trip, and field blanks were not collected with the samples of this data set. One rinsate blank (BP-QC-WT-T1) was collected for this sampling period in data set 10163606 to evaluate possible equipment sources of contamination.	
19. Were the trip blank, field blank, and/or equipment blank samples free of analyte contamination?	No
Comments: Detections were not reported in the rinsate blank, with the following exception. Total recoverable lead was detected at 0.47 µg/L in the rinsate blank. Qualification was not required since total recoverable lead was not a target analyte for the samples reported in data set 10156716.	
20. Was the number of field duplicates collected equal to at least 10% of the total number of samples, or as required by the project guidelines, QAPP, SAP, or permit?	Yes
Comments: One field duplicate was submitted with this sample set, which is equal to at least 10% of the total number of samples. Sample FIELD DUPLICATE was prepared as the duplicate of sample CMMW-1.	
21. Were field duplicate RPD values within data validation QC limits (water 0-30%)?	No
Comments: Field duplicate RPD values were within data validation QC limits, with the following exceptions. **As detailed in the Field Duplicate Summary table at the end of this data validation review, several field duplicate RPD values were outside of data validation QC limits. As a result, the detections of dissolved copper, dissolved manganese, dissolved potassium, TDS, and TSS reported for the parent and duplicate samples were qualified as J due to evidence of poor repeatability. Additionally, the field duplicate RPDs for dissolved iron and dissolved lead were extremely high, and these analytes were qualified as J or UJ for each sample reported in this data set based on professional judgment. Please see the Field Duplicate Summary table at the end of this data validation review.**	

VALIDATION CRITERIA CHECKLIST

22. Were laboratory duplicate RPD values within laboratory QC limits? Yes

Comments: Laboratory duplicates were not prepared for Method 300.0, SM2540D, and SM2540C. Laboratory duplicates were prepared for the remaining sample analyses. The project samples used for the laboratory duplicate sample analyses are summarized in the table below.

Analysis	Batch	Parent Sample
SM 2540D	MT/5953	CMMW-7
EPA 300.0	MT/5963	CMMW-2
SM 2540C	WET/22274	CMMW-1

Additional MS/MSDs were prepared for each batch from samples not associated with this sample event.

The laboratory duplicate RPD values were within laboratory QC limits, or were not applicable since one or both sample results were either non-detect or were detected at less than five times the laboratory reporting limit.

FIELD DUPLICATE SUMMARY

Client Sample ID: CMMW-1 Field Duplicate Sample ID: FIELD DUPLICATE			
Analyte	**Laboratory Result**	**Duplicate Result**	**Relative Percent Difference (RPD)**
Arsenic, Dissolved	1.6 µg/L	1.2 µg/L	28.6%
Cadmium, Dissolved	0.13 µg/L	0.1 µg/L	26.1% +/- RL
Calcium, Dissolved	7040 µg/L	7020 µg/L	0.3%
Copper, Dissolved	**1.3 µg/L**	**0.93 µg/L**	**33.2%**
Iron, Dissolved	**550 µg/L**	**73 µg/L**	**153.1%**
Lead, Dissolved	**0.9 µg/L**	**0.15 µg/L**	**142.9%**
Magnesium, Dissolved	3960 µg/L	3840 µg/L	3.1%
Manganese, Dissolved	**7.1 µg/L**	**3.6 µg/L**	**65.4%**
Potassium, Dissolved	**1270 µg/L**	**864 µg/L**	**38.1%**
Sodium, Dissolved	8380 µg/L	10100 µg/L	18.6%
Zinc, Dissolved	6.1 µg/L	ND(5 µg/L)	DL
Sulfate	2.3 mg/L	2.8 mg/L	19.6%
Alkalinity, Total as CaCO3	42.6 mg/L	48.1 mg/L	12.1%
Total Dissolved Solids	**86.0 mg/L**	**231 mg/L**	**91.5%**
Total Suspended Solids	**1930 mg/L**	**3810 mg/L**	**65.5%**

Field duplicate RPD control limits are not to exceed 30% for water, 50% for soil, or 25% for air or vapor as established by USEPA Region 1 Laboratory Data Validation Function Guidelines for Evaluation of Organic Analysis, December 1996.

The field duplicate RPDs for dissolved copper, dissolved manganese, dissolved potassium, TDS, and TSS were outside the data validation QC limits of 0-30%. As a result, the detections for the parent and duplicate samples were qualified as J due to possible poor repeatability.

Additionally, the field duplicate RPDs for dissolved iron and dissolved lead were extremely high, well above the 0-30% data validation QC limits. Dissolved iron and dissolved lead were qualified as J or UJ for each sample reported in this data set based on professional judgment.

DL – Indicates that the analyte was detected in one of the duplicate samples and was undetected in the other sample, and therefore an RPD could not be calculated. No data were qualified since the detection was within two times the reporting limit.

+/-RL – Indicates that the detections in the samples are within two times the reporting limit. No qualification of data is required.

DATA QUALIFICATION SUMMARY

Analyte	Client Sample ID	Laboratory Assigned ID	Laboratory Result	Reviewer Qualifier	Reason for Qualification
Iron, Dissolved	CMMW-1	10156716001	550 µg/L	J	High field duplicate RPD value
Iron, Dissolved	CMMW-2	10156716002	121 µg/L	J	High field duplicate RPD value
Iron, Dissolved	CMMW-3	10156716003	ND(50 µg/L)	UJ	High field duplicate RPD value
Iron, Dissolved	CMMW-4	10156716004	ND(50 µg/L)	UJ	High field duplicate RPD value
Iron, Dissolved	CMMW-5	10156716005	988 µg/L	J	High field duplicate RPD value
Iron, Dissolved	CMMW-6	10156716006	661 µg/L	J	High field duplicate RPD value
Iron, Dissolved	CMMW-7	10156716007	2050 µg/L	J	High field duplicate RPD value
Iron, Dissolved	CMMW-8	10156716008	281 µg/L	J	High field duplicate RPD value
Iron, Dissolved	CMMW-9	10156716009	197 µg/L	J	High field duplicate RPD value
Iron, Dissolved	FIELD DUPLICATE	10156716010	73 µg/L	J	High field duplicate RPD value
Lead, Dissolved	CMMW-1	10156716001	0.9 µg/L	J	High field duplicate RPD value
Lead, Dissolved	CMMW-2	10156716002	8.6 µg/L	J	High field duplicate RPD value
Lead, Dissolved	CMMW-3	10156716003	0.31 µg/L	J	High field duplicate RPD value
Lead, Dissolved	CMMW-4	10156716004	0.12 µg/L	J	High field duplicate RPD value
Lead, Dissolved	CMMW-5	10156716005	23.2 µg/L	J	High field duplicate RPD value
Lead, Dissolved	CMMW-6	10156716006	4.1 µg/L	J	High field duplicate RPD value
Lead, Dissolved	CMMW-7	10156716007	2.6 µg/L	J	High field duplicate RPD value
Lead, Dissolved	CMMW-8	10156716008	0.48 µg/L	J	High field duplicate RPD value
Lead, Dissolved	CMMW-9	10156716009	0.38 µg/L	J	High field duplicate RPD value
Lead, Dissolved	FIELD DUPLICATE	10156716010	0.15 µg/L	J	High field duplicate RPD value
Manganese, Dissolved	CMMW-1	10156716001	7.1 µg/L	J	High field duplicate RPD value
Manganese, Dissolved	FIELD DUPLICATE	10156716010	3.6 µg/L	J	High field duplicate RPD value
Potassium, Dissolved	CMMW-1	10156716001	1270 µg/L	J	High field duplicate RPD value
Potassium, Dissolved	FIELD DUPLICATE	10156716010	864 µg/L	J	High field duplicate RPD value
Total Suspended Solids	CMMW-1	10156716001	1930 mg/L	J	High field duplicate RPD value
Total Suspended Solids	FIELD DUPLICATE	10156716010	3810 mg/L	J	High field duplicate RPD value
Solids, Total Dissolved	CMMW-1	10156716001	86 mg/L	J	High field duplicate RPD value
Solids, Total Dissolved	FIELD DUPLICATE	10156716010	231 mg/L	J	High field duplicate RPD value
Copper, Dissolved	CMMW-1	10156716001	1.30 µg/L	J	High field duplicate RPD value
Copper, Dissolved	FIELD DUPLICATE	10156716010	0.93 µg/L	J	High field duplicate RPD value

ATTACHMENT A-2

DATA VALIDATION REPORT FOR DATA SETS 10158290 AND 10160655

Tier II Data Validation Report Summary

Client: Montana Department of Environmental Quality (MDEQ)	Laboratory: Pace Analytical Services, Inc. – Billings, Montana
Project Name: Black Pine Mine	Sample Matrix: Surface Water
Project Number: 776-012-002	Sample Start Date: 5/19/2011
Date Validated: 9/6/2011	Sample End Date: 6/15/2011
Parameters Included: Total Recoverable Metals (SB, As, Ba, Cd, Cr, Cu, Fe, Pb, Mn, Ni, Au, and Zn) by Method 200.8, Dissolved Metals (As, Cd, Ca, Cu, Fe, Pb, Mg, Mn, K, Na, and Zn), Low Level Mercury by Method 1631E, Acidity by Method Standard Method (SM) 2310, Total Suspended Solids (TSS) by SM 2540D, Sulfate by EPA Method 300.0 IC Anions, Alkalinity, Total as $CaCO_3$ by SM 2320B, Total Hardness by SM 2340 B, and Total Dissolved Solids (TDS) by SM 2540C	
Laboratory Project ID: 10160655 and 10158290, Low Level Mercury in 10160851 and 10160853	
Data Validator: Nella Dagnillo, Chemical Engineer, E.I.T.	

DATA EVALUATION CRITERIA SUMMARY

A Tier II Data Validation was performed by Trihydro Corporation's Chemical Data Evaluation Services Group on the analytical data report package generated by Pace Analytical Services, Inc., evaluating samples from the Black Pine Mine site, located in Granite, Montana.

Precision, accuracy, method compliance, and completeness of this data package were assessed during this data review. Precision was determined by evaluating the calculated relative percent difference (RPD) values of samples from field and laboratory duplicate pairs. Laboratory accuracy was established by reviewing the demonstrated percent recoveries of matrix spike (MS) and matrix spike duplicate (MSD) samples, and of laboratory control samples (LCS) and laboratory control sample duplicate (LCSD) verify that data are not biased. Additionally, field accuracy was established by collecting field, trip, and equipment blanks to monitor for possible ambient or cross contamination during sampling. Method compliance was established by reviewing holding times, detection limits, surrogate recoveries, method blanks, and the LCS and LCSD percent recoveries against method-specific requirements. Completeness was evaluated by determining the overall ratio of the number of samples planned versus the number of samples with valid analyses. Determination of completeness included a review of the chain-of-custody (CoC), laboratory analytical methods, and other necessary documents associated with this analytical data set.

Data were evaluated in general accordance with validation criteria set forth in the United States Environmental Protection Agency (USEPA) Contract Laboratory Program (CLP) National Functional Guidelines for Inorganic Superfund Data Review, document number EPA 540R-10-011, January 2010.

Tier II Data Validation Report Summary

SAMPLE NUMBERS TABLE

Client Sample ID	Laboratory Sample Number
Data Set 10160655	
CML-SW-07	10160655001
CML-SW-03	10160655002
CML-SW-08	10160655003
CML-SW-10	10160655004
CML-SW-16	10160655005
CML-SW-15	10160655006
CML-Q1-T1	10160655007
CML-SW-04	10160655008
CML-SW-13	10160655009
CML-SW-05	10160655010
CML-SW-11	10160655011
Data Set 10158290	
CPS-1	10158290001
CPS-10A	10158290002
CPS-2	10158290003
CPS-7A	10158290004
CPS-8	10158290005
CPSW-1	10158290006
CPSW-2	10158290007
NORTH RUNOFF	10158290008
TSP-10	10158290009
BD-1	10158290010
CPS-10B	10158290011
CPS-11	10158290012
ROAD CUT	10158290013
Data Set 10160851	
CML-SW-07	10160851001
FIELD BLANK 1	10160851007
Data Set 10160853	
CML-SW-11	10160853002
CML-SW-03	10160853003
CML-SW-16	10160853005

Tier II Data Validation Report Summary

Client Sample ID	Laboratory Sample Number
CML-SW-08	10160853007
CML-SW-15	10160853009
CML-SW-10	10160853010
CML-SW-05	10160853011
CML-SW-13	10160853012
CML-SW-04	10160853014
FIELD_BLANK_2	10160853016

Tier II Data Validation Report Summary

The samples were analyzed for the required analytes. Assessment of CoC completeness is included in Section #3. The laboratory data were reviewed to evaluate compliance with the required methods and the quality of the reported data. A leading check mark (✓) indicates that the referenced validation criteria were deemed acceptable. A preceding crossed circle (⊗) indicates validation criteria for which the data may have been qualified by the data validator. Details are noted in the tables below.

Validation Criteria

- ✓ Data Completeness
- ✓ CoC Documentation
- ✓ Holding Times and Preservation
- ✓ Laboratory Blanks
- ✓ LCS
- ⊗ MS/MSD
- ⊗ Laboratory Duplicates
- ⊗ Field Duplicates
- ⊗ Equipment Rinsate

OVERALL DATA PACKAGE ASSESSMENT

Based on a data validation review, the data are acceptable as delivered; exceptions (i.e., rejected data) are noted below. Data qualified by the laboratory are discussed in Section #2.

The purpose of validating data and assigning qualifiers is to assist in proper data interpretation. Data which are not qualified meet the site data quality objectives. If values are assigned qualifiers other than an R (rejected, data not usable), the data may be used for site evaluation, with the reasons for qualification being given consideration when interpreting sample concentrations. Data points which are assigned an R qualifier should not be used for site evaluation purposes. Text identified in **bold font** indicates that further action and/or qualification of the data were required. Data validation qualifiers were added for the items noted with crossed circles, above. Please see the Data Qualification Summary table at the end of this report for a complete list of samples and analytes qualified.

Data qualifiers used during this validation included:

J – Estimated concentration

UJ – Estimated reporting limit

U – Evaluated to be undetected at the reporting limit

JB – Estimated concentration due to blank contamination

Data Completeness

The analyses were performed as requested on the CoC records. The associated samples were received by the laboratory and analyzed properly. No data points were rejected. The data completeness measure for this data package is 100% and is acceptable.

VALIDATION CRITERIA CHECKLIST	
1. Was the report free of non-conformances related to the analytical data identified by the laboratory?	No
Comments: The laboratory noted the following non-conformances within the case narrative of the laboratory reports: 200.8: Data Sets 10160655 and 10158290: Several MS and MSDs were recovered outside of the laboratory quality control (QC) limits. In addition, several RPD values were reported outside of the laboratory QC limits. SM 2320B: Data Set 10160655: Several MS and MSDs were recovered outside of the laboratory QC limits. SM 2310: Data Set 10158290: Several laboratory duplicate RPD values were outside of the laboratory QC limits. SM2540D: Data Set 10158290: Several laboratory duplicate RPD values were outside of the laboratory QC limits.	
2. Were data qualification flags or other notes used by the laboratory? If yes, define.	Yes
Comments: The laboratory included the following flags within the report: M1: Matrix spike recovery exceeded QC limits. Batch accepted based on LCS recovery. R1: RPD value was outside control limits. D6: The RPD between the sample and sample duplicate exceeded laboratory control limits.	
3. Were sample CoC forms complete?	No
Comments: The CoC records from field to laboratory were complete, and custody was maintained as evidenced by field and laboratory personnel signatures, dates, and times of receipt.	
4. Were detection limits in accordance with the quality assurance project plan (QAPP), permit, or method, or indicated as acceptable?	Yes
Comments: Detection limits and dilutions were reviewed, and were acceptable. Dilution levels were not noted within the reports, but were recorded in the electronic data deliverables. 10158290: Dilutions ranging from 2 to 50 times were required for Method 200.8. Dilutions of 2 to 25 times were required for sulfate.	
5. Were the requested analytical methods in compliance with the QAPP, permit, or CoC?	Yes
Comments: The analytical methods were in accordance with project requirements.	
6. Were samples received in good condition within method specified requirements?	Yes
Comments: The samples were received intact, and in good condition with cooler temperatures within the 4°C +/- 2°C acceptance range from 2.4°C to 4.9°C as noted on the Sample Condition Upon Receipt.	
7. Were samples analyzed within method specified or technical holding times?	Yes
Comments: Samples were analyzed within the method specified holding times.	
8. Were reported units appropriate for the sample matrix/matrices and method(s) of analyses?	Yes
Comments: Results were reported in units of µg/L and mg/L. These units were acceptable for the reported sample matrix and analyses.	
9. Do the laboratory reports include all constituents requested to be reported?	Yes
Comments: Reported constituents were in accordance with project requirements.	

VALIDATION CRITERIA CHECKLIST	
10. Was there indication from the laboratory that the initial or continuing calibration verification results were within acceptable limits?	Yes
Comments: Calibration results were not reported with samples of this data set. However, it is assumed that calibration results were acceptable since the laboratory did not report non-conformances.	
11. Was the total number of laboratory blank samples prepared equal to at least 5% of the total number of samples, or analyzed as required by the method?	Yes
Comments: Laboratory blanks were reported on a greater than 5% basis for all methods. Quality control data were neither provided nor required for the analysis of total hardness.	
12. Were laboratory blank samples free of analyte contamination?	Yes
Comments: Laboratory blank samples were free of analyte contamination.	
13. Was the total number of matrix spike samples prepared equal to at least 5% of the total number of samples, or analyzed as required by the method?	Yes
Comments: Matrix spikes were reported on a greater than 5% basis, with the following exception. Matrix spikes were not prepared nor were required for TSS, TDS, and acidity. These data were validated using sample duplicates. Data Set 10160655: Matrix spikes for Method 200.8 batch MPRP/26726 were prepared from sample CML-SW-07 and sample TSP-6 of data set 10160673. Matrix spikes for Method SM 2320B batch WET/22674 were prepared from sample TSP-8 of data set 10160707 and another client's sample. Other matrix spikes were prepared from other client's samples. Data Set 10158290: Matrix spikes for Method 200.8 batch MPRP/26262 were prepared from sample CPSW-2 and from another client's sample. Matrix spikes for Method EPA 300.0 batch MT/6064 were prepared from sample CPS-1 and from another client's sample. Matrix spikes for SM 2320B batch WET/22431 were prepared from sample North Runoff and from another client's sample. Data Set 10160851: Matrix spikes for Method 1631E batch L-062811-2-A were prepared from other client samples. Data Set 10160853: Matrix spikes for Method 1631E batch L-062811-A were prepared from other client samples. Quality control data were neither provided nor required for the analysis of total hardness.	
14. Were MS/MSD percent recoveries and MS/MSD RPDs within data validation or laboratory QC limits?	No
Comments: Matrix spike samples prepared from non-project samples were outside of QC limits in some batches. However, data were not qualified since matrix similarity to project samples could not be guaranteed. The following matrix spikes associated with client results were outside of the laboratory QC limits. Data Set 10160655: The MS and MSD recoveries for total iron in batch MPRP/26726 (prepared from sample CML-SW-07) were outside of the laboratory QC limits of 70-130% at 138% and 147%, respectively. Additionally, the second MS recovery for total iron in batch MPRP/26726 (prepared from sample TSP-6 of data set 10160673) was outside of the laboratory QC limits of 70-130% at 131%. **As a result, associated detections were flagged J due to evidence of a high bias.** Data Set 10158290: The MS and MSD recoveries for copper dissolved (146%-MS only), iron dissolved (242% and 268%), magnesium dissolved (143% and 176%), potassium dissolved (167% and 192%), sodium dissolved (161%-MSD only), and zinc dissolved (137% and 180%) in batch MPRP/26262 sample CPSW-2 were outside of the laboratory QC limits of 70-130%. The recovery for calcium dissolved was outside of the laboratory QC limits; however, the background concentration was greater than four times the spike concentration; therefore, no qualification was necessary. **Associated detections for dissolved copper, iron, magnesium, potassium, sodium, and zinc were flagged J due to evidence of high biases.**	
15. Was the total number of LCSs analyzed equal to at least 5% of the total number of samples, or analyzed as required by the method?	Yes
Comments: Laboratory control samples were analyzed on a greater than 5% basis for all analyses. Laboratory control samples were not prepared nor were required for the analysis of acidity. Quality control data were neither provided nor required for the analysis of total hardness.	

VALIDATION CRITERIA CHECKLIST	
16. Were LCS/LCSD percent recoveries and LCS/LCSD RPDs within data validation or laboratory QC limits?	Yes
Comments: The LCS recoveries were within laboratory QC limits.	
17. Were surrogate recoveries within laboratory QC limits?	N/A
Comments: Surrogate spikes were not required for the methods of this data set. Quality control data were neither provided nor required for the analysis of total hardness.	
18. Was the number of equipment, trip, or field blanks collected equal to at least 10% of the total number of samples, or as required by the project guidelines, QAPP, SAP, or permit?	No
Comments: Equipment and trip blanks were not collected with the samples of this sample set. One rinsate blank (BP-QC-WT-T1) was collected for this sampling period in data set 10163606 to evaluate possible equipment sources of contamination. Two field blanks were collected for low level mercury to evaluate possible ambient field sources of contamination. Sample FIELD BLANK 1 was reported in data set 10160851, and sample FIELD BLANK 2 was reported in data set 10160853.	
19. Were the trip blank, field blank, and/or equipment blank samples free of analyte contamination?	No
Comments: Detections were not reported in the rinsate blank, with the following exception. **Total recoverable lead was detected at 0.47 µg/L in the rinsate blank. Where detected at less than the laboratory reporting limit or the rinsate blank detection in associated samples, total recoverable lead was qualified as U to indicate it was estimated below the reporting limits. Detections greater than the rinsate blank detection and reporting limits, but less than 10 times the rinsate blank detection, were qualified as JB to indicate estimated concentrations due to possible field equipment contamination.**	
20. Was the number of field duplicates collected equal to at least 10% of the total number of samples, or as required by the project guidelines, QAPP, SAP, or permit?	Yes
Comments: Data Set 10160655: One field duplicate was collected with sample of this data set. Sample CML-Q1-T1 was collected as a duplicate of sample BP-CML-SW-15. Data Set 10158290: One field duplicate was collected with sample of this data set. Sample BD-1 was collected as a duplicate of sample CPS-11.	
21. Were field duplicate RPD values within data validation QC limits (soil 0-50%, water 0-30%, or air 0-25%)?	Yes
Comments: Field duplicates were not collected with the sample of this data set, with the following exceptions. **CPS-11/BD-1: The RPD value for sulfate was above the acceptable limit of 30% at 37.6%. As a result, sulfate results were flagged J in the parent and duplicate samples.**	

VALIDATION CRITERIA CHECKLIST	
22. Were laboratory duplicate RPD values within laboratory QC limits?	No

Comments:

Data Set 10160655: Laboratory duplicates were prepared for acidity, TSS, sulfate, and TDS. The laboratory duplicate for acidity batch MT/6228 was prepared from sample CML-SW-008. Laboratory duplicates for TSS batch MT/6192 were prepared from samples CML-SW-16, and CML-SW-18 of data set 10160673. Laboratory duplicates for TDS batch WET/22678 were prepared from samples CML-SW-03 and TSP-8 of data set 10160707. Laboratory duplicates for TDS batch WET/22692 were prepared from samples CML-SW-16 and CML-SW-15.

Data Set 10158290: Laboratory duplicates were prepared for acidity, TSS, sulfate, and TDS. Laboratory duplicates for acidity batch MT/6058 were prepared from samples CPS-7A and other client samples. Laboratory duplicates for TSS batch MT/6046 were prepared from samples CPS-7A and other client's samples. Laboratory duplicates for batch MT/6064 were prepared from samples CPS-8 and other client's samples. Laboratory duplicates for batch WET/22417 were prepared from samples CPS-1 and other client's samples. Laboratory duplicates for batch WET/22430 were prepared from samples Road Cut and other client's samples. Laboratory duplicate RPD values were within laboratory QC limits, with the following exceptions. The laboratory duplicate RPD for batch MT/6058 and acidity was above the laboratory QC limits of 20% at 21%. The laboratory duplicate RPD for batch MT/6046 and TSS was above the laboratory QC limits of 20% at 29%. **As a result, acidity and TSS results were flagged J for detected values and UJ for undetected values.**

Laboratory duplicates were not prepared for the analyses of low level mercury in data sets 10160851 and 10160853.

Quality control data were neither provided nor required for the analysis of total hardness.

FIELD DUPLICATE SUMMARY

Client Sample ID: CPS-11 Field Duplicate Sample ID: BD-1			
Analyte	**Laboratory Result**	**Duplicate Result**	**Relative Percent Difference (RPD)**
Acidity	34.4 mg/L	44.1 mg/L	24.7%
Arsenic, Dissolved	1.7 µg/L	2.0 µg/L	16.2%
Cadmium, Dissolved	13.4 µg/L	13.7 µg/L	2.2%
Calcium, Dissolved	13300 µg/L	13600 µg/L	2.2%
Copper, Dissolved	638µg/L	700 µg/L	9.3%
Iron, Dissolved	1340µg/L	1670 µg/L	21.9%
Lead, Dissolved	2.8 µg/L	3.3 µg/L	16.4%
Magnesium, Dissolved	5120µg/L	5290 µg/L	3.3%
Manganese, Dissolved	113µg/L	118 µg/L	4.3%
Potassium, Dissolved	1930µg/L	2030 µg/L	5.1%
Sodium, Dissolved	3260µg/L	4130 µg/L	23.5%
Zinc, Dissolved	1010 µg/L	1130 µg/L	11.2%
Sulfate	**28.5 mg/L**	**41.7 mg/L**	**37.6%**
Alkalinity	12.9 mg/L	13.2 mg/L	2.3%
Solids, Total Suspended	21.0 mg/L	25.8 mg/L	20.5%
Solids, Total Dissolved	144 mg/L	126 mg/L	13.3%

Field duplicate RPD control limits are not to exceed 30% for water, 50% for soil, or 25% for air or vapor as established by USEPA Region 1 Laboratory Data Validation Function Guidelines for Evaluation of Organic Analysis, December 1996. **The RPD value for sulfate was above the acceptable limit of 30% at 37.6%. Sulfate results were flagged J in the parent and duplicate samples.**

Client Sample ID: CML-SW-15 Field Duplicate Sample ID: CML-Q1-T1			
Analyte	**Laboratory Result**	**Duplicate Result**	**Relative Percent Difference (RPD)**
Arsenic, Total Recoverable	0.68 µg/L	0.65 µg/L	4.5%/+/-RL
Barium, Total Recoverable	42.5 µg/L	43.4 µg/L	2.1%
Chromium, Total Recoverable	0.64 µg/L	0.79 µg/L	2.1%/+/-RL
Copper, Total Recoverable	5.8 µg/L	6.0 µg/L	3.4%
Iron, Total Recoverable	321 µg/L	340 µg/L	5.7%
Lead, Total Recoverable	0.61 µg/L	0.63 µg/L	3.2%
Manganese, Total Recoverable	5.6 µg/L	5.8 µg/L	3.5%
Nickel, Total Recoverable	0.62 µg/L	0.75 µg/L	19.0%/+/-RL

Field duplicate RPD control limits are not to exceed 30% for water, 50% for soil, or 25% for air or vapor as established by USEPA Region 1 Laboratory Data Validation Function Guidelines for Evaluation of Organic Analysis, December 1996.

DL – Indicates that the analyte was detected in one of the duplicate samples and was undetected in the other sample, and therefore an RPD could not be calculated. No data were qualified since the detection was within two times the reporting limit.

+/-RL – Indicates that the detections in the samples are within two times the reporting limit. No qualification of data is required.

DATA QUALIFICATION SUMMARY

Analyte	Field Sample ID	Lab Sample ID	Result	Units	Reviewer Qualifier	Reviewer Qualifier Reason
Iron, Total Recoverable	CML-Q1-T1	10160655007	340	µg/L	J	The MS and/or MSD recovery(ies) were above the acceptable limits indicating possible matrix interference.
Iron, Total Recoverable	CML-SW-03	10160655002	1450	µg/L	J	The MS and/or MSD recovery(ies) were above the acceptable limits indicating possible matrix interference.
Iron, Total Recoverable	CML-SW-04	10160655008	288	µg/L	J	The MS and/or MSD recovery(ies) were above the acceptable limits indicating possible matrix interference.
Iron, Total Recoverable	CML-SW-05	10160655010	162	µg/L	J	The MS and/or MSD recovery(ies) were above the acceptable limits indicating possible matrix interference.
Iron, Total Recoverable	CML-SW-07	10160655001	1430	µg/L	J	The MS and/or MSD recovery(ies) were above the acceptable limits indicating possible matrix interference.
Iron, Total Recoverable	CML-SW-08	10160655003	381	µg/L	J	The MS and/or MSD recovery(ies) were above the acceptable limits indicating possible matrix interference.
Iron, Total Recoverable	CML-SW-10	10160655004	338	µg/L	J	The MS and/or MSD recovery(ies) were above the acceptable limits indicating possible matrix interference.
Iron, Total Recoverable	CML-SW-11	10160655011	400	µg/L	J	The MS and/or MSD recovery(ies) were above the acceptable limits indicating possible matrix interference.
Iron, Total Recoverable	CML-SW-13	10160655009	168	µg/L	J	The MS and/or MSD recovery(ies) were above the acceptable limits indicating possible matrix interference.
Iron, Total Recoverable	CML-SW-15	10160655006	321	µg/L	J	The MS and/or MSD recovery(ies) were above the acceptable limits indicating possible matrix interference.
Iron, Total Recoverable	CML-SW-16	10160655005	356	µg/L	J	The MS and/or MSD recovery(ies) were above the acceptable limits indicating possible matrix interference.
Lead, Total Recoverable	CML-Q1-T1	10160655007	0.63	µg/L	JB	Equipment blank detection
Lead, Total Recoverable	CML-SW-03	10160655002	2.9	µg/L	JB	Equipment blank detection
Lead, Total Recoverable	CML-SW-04	10160655008	0.31	µg/L	U	Equipment blank detection
Lead, Total Recoverable	CML-SW-05	10160655010	0.12	µg/L	U	Equipment blank detection
Lead, Total Recoverable	CML-SW-08	10160655003	3.7	µg/L	JB	Equipment blank detection

Analyte	Field Sample ID	Lab Sample ID	Result	Units	Reviewer Qualifier	Reviewer Qualifier Reason
Lead, Total Recoverable	CML-SW-10	10160655004	2.7	µg/L	JB	Equipment blank detection
Lead, Total Recoverable	CML-SW-11	10160655011	1.7	µg/L	JB	Equipment blank detection
Lead, Total Recoverable	CML-SW-13	10160655009	0.18	µg/L	U	Equipment blank detection
Lead, Total Recoverable	CML-SW-15	10160655006	0.61	µg/L	JB	Equipment blank detection
Acidity	BD-1	10158290010	44.1	mg/L	J	Laboratory duplicate RPD outside QC limits
Acidity	CPS-1	10158290001	84.8	mg/L	J	Laboratory duplicate RPD outside QC limits
Acidity	CPS-10A	10158290002	75.7	mg/L	J	Laboratory duplicate RPD outside QC limits
Acidity	CPS-10B	10158290011	40.2	mg/L	J	Laboratory duplicate RPD outside QC limits
Acidity	CPS-11	10158290012	34.4	mg/L	J	Laboratory duplicate RPD outside QC limits
Acidity	CPS-2	10158290003	17.9	mg/L	J	Laboratory duplicate RPD outside QC limits
Acidity	CPS-7A	10158290004	37.3	mg/L	J	Laboratory duplicate RPD outside QC limits
Acidity	CPS-8	10158290005	23.7	mg/L	J	Laboratory duplicate RPD outside QC limits
Acidity	CPSW-1	10158290006	26.6	mg/L	J	Laboratory duplicate RPD outside QC limits
Acidity	CPSW-2	10158290007	36.3	mg/L	J	Laboratory duplicate RPD outside QC limits
Acidity	NORTH RUNOFF	10158290008	36.3	mg/L	J	Laboratory duplicate RPD outside QC limits
Acidity	ROAD CUT	10158290013	11.1	mg/L	J	Laboratory duplicate RPD outside QC limits
Acidity	TSP-10	10158290009	ND (5)	mg/L	UJ	Laboratory duplicate RPD outside QC limits

Analyte	Field Sample ID	Lab Sample ID	Result	Units	Reviewer Qualifier	Reviewer Qualifier Reason
Copper, Dissolved	BD-1	10158290010	700	µg/L	J	The MS and/or MSD recovery(ies) were above the acceptable limits indicating possible matrix interference.
Copper, Dissolved	CPS-1	10158290001	11100	µg/L	J	The MS and/or MSD recovery(ies) were above the acceptable limits indicating possible matrix interference.
Copper, Dissolved	CPS-10A	10158290002	20900	µg/L	J	The MS and/or MSD recovery(ies) were above the acceptable limits indicating possible matrix interference.
Copper, Dissolved	CPS-10B	10158290011	8600	µg/L	J	The MS and/or MSD recovery(ies) were above the acceptable limits indicating possible matrix interference.
Copper, Dissolved	CPS-11	10158290012	638	µg/L	J	The MS and/or MSD recovery(ies) were above the acceptable limits indicating possible matrix interference.
Copper, Dissolved	CPS-2	10158290003	21.2	µg/L	J	The MS and/or MSD recovery(ies) were above the acceptable limits indicating possible matrix interference.
Copper, Dissolved	CPS-7A	10158290004	4320	µg/L	J	The MS and/or MSD recovery(ies) were above the acceptable limits indicating possible matrix interference.
Copper, Dissolved	CPS-8	10158290005	339	µg/L	J	The MS and/or MSD recovery(ies) were above the acceptable limits indicating possible matrix interference.
Copper, Dissolved	CPSW-1	10158290006	89.9	µg/L	J	The MS and/or MSD recovery(ies) were above the acceptable limits indicating possible matrix interference.
Copper, Dissolved	CPSW-2	10158290007	126	µg/L	J	The MS and/or MSD recovery(ies) were above the acceptable limits indicating possible matrix interference.
Copper, Dissolved	NORTH RUNOFF	10158290008	666	µg/L	J	The MS and/or MSD recovery(ies) were above the acceptable limits indicating possible matrix interference.
Copper, Dissolved	ROAD CUT	10158290013	16.8	µg/L	J	The MS and/or MSD recovery(ies) were above the acceptable limits indicating possible matrix interference.
Copper, Dissolved	TSP-10	10158290009	6.3	µg/L	J	The MS and/or MSD recovery(ies) were above the acceptable limits indicating possible matrix interference.
Iron, Dissolved	BD-1	10158290010	1670	µg/L	J	The MS and/or MSD recovery(ies) were above the acceptable limits indicating possible matrix interference.
Iron, Dissolved	CPS-10A	10158290002	1140	µg/L	J	The MS and/or MSD recovery(ies) were above the acceptable limits indicating possible matrix interference.
Iron, Dissolved	CPS-10B	10158290011	4700	µg/L	J	The MS and/or MSD recovery(ies) were above the acceptable limits indicating possible matrix interference.
Iron, Dissolved	CPS-11	10158290012	1340	µg/L	J	The MS and/or MSD recovery(ies) were above the acceptable limits indicating possible matrix interference.

Analyte	Field Sample ID	Lab Sample ID	Result	Units	Reviewer Qualifier	Reviewer Qualifier Reason
Iron, Dissolved	CPS-2	10158290003	1580	µg/L	J	The MS and/or MSD recovery(ies) were above the acceptable limits indicating possible matrix interference.
Iron, Dissolved	CPS-7A	10158290004	41400	µg/L	J	The MS and/or MSD recovery(ies) were above the acceptable limits indicating possible matrix interference.
Iron, Dissolved	CPS-8	10158290005	1950	µg/L	J	The MS and/or MSD recovery(ies) were above the acceptable limits indicating possible matrix interference.
Iron, Dissolved	CPSW-1	10158290006	1380	µg/L	J	The MS and/or MSD recovery(ies) were above the acceptable limits indicating possible matrix interference.
Iron, Dissolved	CPSW-2	10158290007	777	µg/L	J	The MS and/or MSD recovery(ies) were above the acceptable limits indicating possible matrix interference.
Iron, Dissolved	NORTH RUNOFF	10158290008	1460	µg/L	J	The MS and/or MSD recovery(ies) were above the acceptable limits indicating possible matrix interference.
Iron, Dissolved	ROAD CUT	10158290013	1810	µg/L	J	The MS and/or MSD recovery(ies) were above the acceptable limits indicating possible matrix interference.
Iron, Dissolved	TSP-10	10158290009	2990	µg/L	J	The MS and/or MSD recovery(ies) were above the acceptable limits indicating possible matrix interference.
Magnesium, Dissolved	BD-1	10158290010	5290	µg/L	J	The MS and/or MSD recovery(ies) were above the acceptable limits indicating possible matrix interference.
Magnesium, Dissolved	CPS-1	10158290001	27300	µg/L	J	The MS and/or MSD recovery(ies) were above the acceptable limits indicating possible matrix interference.
Magnesium, Dissolved	CPS-10A	10158290002	9020	µg/L	J	The MS and/or MSD recovery(ies) were above the acceptable limits indicating possible matrix interference.
Magnesium, Dissolved	CPS-10B	10158290011	24300	µg/L	J	The MS and/or MSD recovery(ies) were above the acceptable limits indicating possible matrix interference.
Magnesium, Dissolved	CPS-11	10158290012	5120	µg/L	J	The MS and/or MSD recovery(ies) were above the acceptable limits indicating possible matrix interference.
Magnesium, Dissolved	CPS-2	10158290003	1760	µg/L	J	The MS and/or MSD recovery(ies) were above the acceptable limits indicating possible matrix interference.
Magnesium, Dissolved	CPS-7A	10158290004	16700	µg/L	J	The MS and/or MSD recovery(ies) were above the acceptable limits indicating possible matrix interference.
Magnesium, Dissolved	CPS-8	10158290005	3820	µg/L	J	The MS and/or MSD recovery(ies) were above the acceptable limits indicating possible matrix interference.
Magnesium, Dissolved	CPSW-1	10158290006	2130	µg/L	J	The MS and/or MSD recovery(ies) were above the acceptable limits indicating possible matrix interference.

Analyte	Field Sample ID	Lab Sample ID	Result	Units	Reviewer Qualifier	Reviewer Qualifier Reason
Magnesium, Dissolved	CPSW-2	10158290007	2320	µg/L	J	The MS and/or MSD recovery(ies) were above the acceptable limits indicating possible matrix interference.
Magnesium, Dissolved	NORTH RUNOFF	10158290008	6460	µg/L	J	The MS and/or MSD recovery(ies) were above the acceptable limits indicating possible matrix interference.
Magnesium, Dissolved	ROAD CUT	10158290013	1560	µg/L	J	The MS and/or MSD recovery(ies) were above the acceptable limits indicating possible matrix interference.
Magnesium, Dissolved	TSP-10	10158290009	2130	µg/L	J	The MS and/or MSD recovery(ies) were above the acceptable limits indicating possible matrix interference.
Potassium, Dissolved	BD-1	10158290010	2030	µg/L	J	The MS and/or MSD recovery(ies) were above the acceptable limits indicating possible matrix interference.
Potassium, Dissolved	CPS-1	10158290001	3690	µg/L	J	The MS and/or MSD recovery(ies) were above the acceptable limits indicating possible matrix interference.
Potassium, Dissolved	CPS-10A	10158290002	2100	µg/L	J	The MS and/or MSD recovery(ies) were above the acceptable limits indicating possible matrix interference.
Potassium, Dissolved	CPS-10B	10158290011	4630	µg/L	J	The MS and/or MSD recovery(ies) were above the acceptable limits indicating possible matrix interference.
Potassium, Dissolved	CPS-11	10158290012	1930	µg/L	J	The MS and/or MSD recovery(ies) were above the acceptable limits indicating possible matrix interference.
Potassium, Dissolved	CPS-2	10158290003	1660	µg/L	J	The MS and/or MSD recovery(ies) were above the acceptable limits indicating possible matrix interference.
Potassium, Dissolved	CPS-7A	10158290004	7140	µg/L	J	The MS and/or MSD recovery(ies) were above the acceptable limits indicating possible matrix interference.
Potassium, Dissolved	CPS-8	10158290005	1770	µg/L	J	The MS and/or MSD recovery(ies) were above the acceptable limits indicating possible matrix interference.
Potassium, Dissolved	CPSW-1	10158290006	1920	µg/L	J	The MS and/or MSD recovery(ies) were above the acceptable limits indicating possible matrix interference.
Potassium, Dissolved	CPSW-2	10158290007	2030	µg/L	J	The MS and/or MSD recovery(ies) were above the acceptable limits indicating possible matrix interference.
Potassium, Dissolved	NORTH RUNOFF	10158290008	2210	µg/L	J	The MS and/or MSD recovery(ies) were above the acceptable limits indicating possible matrix interference.
Potassium, Dissolved	ROAD CUT	10158290013	1700	µg/L	J	The MS and/or MSD recovery(ies) were above the acceptable limits indicating possible matrix interference.
Potassium, Dissolved	TSP-10	10158290009	1500	µg/L	J	The MS and/or MSD recovery(ies) were above the acceptable limits indicating possible matrix interference.

Analyte	Field Sample ID	Lab Sample ID	Result	Units	Reviewer Qualifier	Reviewer Qualifier Reason
Sodium, Dissolved	BD-1	10158290010	4130	µg/L	J	The MS and/or MSD recovery(ies) were outside the acceptable limits indicating possible matrix interference.
Sodium, Dissolved	CPS-1	10158290001	6450	µg/L	J	The MS and/or MSD recovery(ies) were outside the acceptable limits indicating possible matrix interference.
Sodium, Dissolved	CPS-10A	10158290002	4180	µg/L	J	The MS and/or MSD recovery(ies) were outside the acceptable limits indicating possible matrix interference.
Sodium, Dissolved	CPS-10B	10158290011	6680	µg/L	J	The MS and/or MSD recovery(ies) were outside the acceptable limits indicating possible matrix interference.
Sodium, Dissolved	CPS-11	10158290012	3260	µg/L	J	The MS and/or MSD recovery(ies) were outside the acceptable limits indicating possible matrix interference.
Sodium, Dissolved	CPS-2	10158290003	3000	µg/L	J	The MS and/or MSD recovery(ies) were outside the acceptable limits indicating possible matrix interference.
Sodium, Dissolved	CPS-7A	10158290004	3720	µg/L	J	The MS and/or MSD recovery(ies) were outside the acceptable limits indicating possible matrix interference.
Sodium, Dissolved	CPS-8	10158290005	3900	µg/L	J	The MS and/or MSD recovery(ies) were outside the acceptable limits indicating possible matrix interference.
Sodium, Dissolved	CPSW-1	10158290006	3200	µg/L	J	The MS and/or MSD recovery(ies) were outside the acceptable limits indicating possible matrix interference.
Sodium, Dissolved	CPSW-2	10158290007	3280	µg/L	J	The MS and/or MSD recovery(ies) were outside the acceptable limits indicating possible matrix interference.
Sodium, Dissolved	NORTH RUNOFF	10158290008	3800	µg/L	J	The MS and/or MSD recovery(ies) were outside the acceptable limits indicating possible matrix interference.
Sodium, Dissolved	ROAD CUT	10158290013	2270	µg/L	J	The MS and/or MSD recovery(ies) were outside the acceptable limits indicating possible matrix interference.
Sodium, Dissolved	TSP-10	10158290009	2050	µg/L	J	The MS and/or MSD recovery(ies) were outside the acceptable limits indicating possible matrix interference.
Solids, Total Suspended	BD-1	10158290010	25.8	mg/L	J	Laboratory duplicate RPD outside QC limits
Solids, Total Suspended	CPS-1	10158290001	1.2	mg/L	J	Laboratory duplicate RPD outside QC limits
Solids, Total Suspended	CPS-10A	10158290002	76.8	mg/L	J	Laboratory duplicate RPD outside QC limits
Solids, Total Suspended	CPS-10B	10158290011	644	mg/L	J	Laboratory duplicate RPD outside QC limits

Analyte	Field Sample ID	Lab Sample ID	Result	Units	Reviewer Qualifier	Reviewer Qualifier Reason
Solids, Total Suspended	CPS-11	10158290012	21	mg/L	J	Laboratory duplicate RPD outside QC limits
Solids, Total Suspended	CPS-2	10158290003	2.2	mg/L	J	Laboratory duplicate RPD outside QC limits
Solids, Total Suspended	CPS-7A	10158290004	2670	mg/L	J	Laboratory duplicate RPD outside QC limits
Solids, Total Suspended	CPS-8	10158290005	258	mg/L	J	Laboratory duplicate RPD outside QC limits
Solids, Total Suspended	CPSW-1	10158290006	5	mg/L	J	Laboratory duplicate RPD outside QC limits
Solids, Total Suspended	CPSW-2	10158290007	4.5	mg/L	J	Laboratory duplicate RPD outside QC limits
Solids, Total Suspended	NORTH RUNOFF	10158290008	26.9	mg/L	J	Laboratory duplicate RPD outside QC limits
Solids, Total Suspended	ROAD CUT	10158290013	7.3	mg/L	J	Laboratory duplicate RPD outside QC limits
Solids, Total Suspended	TSP-10	10158290009	28.1	mg/L	J	Laboratory duplicate RPD outside QC limits
Sulfate	BD-1	10158290010	41.7	mg/L	J	High field duplicate RPD value
Sulfate	CPS-11	10158290012	28.5	mg/L	J	High field duplicate RPD value
Zinc, Dissolved	BD-1	10158290010	1130	µg/L	J	The MS and/or MSD recovery(ies) were outside the acceptable limits indicating possible matrix interference.
Zinc, Dissolved	CPS-1	10158290001	12600	µg/L	J	The MS and/or MSD recovery(ies) were outside the acceptable limits indicating possible matrix interference.
Zinc, Dissolved	CPS-10A	10158290002	20400	µg/L	J	The MS and/or MSD recovery(ies) were outside the acceptable limits indicating possible matrix interference.
Zinc, Dissolved	CPS-10B	10158290011	9720	µg/L	J	The MS and/or MSD recovery(ies) were outside the acceptable limits indicating possible matrix interference.
Zinc, Dissolved	CPS-11	10158290012	1010	µg/L	J	The MS and/or MSD recovery(ies) were outside the acceptable limits indicating possible matrix interference.
Zinc, Dissolved	CPS-2	10158290003	20.2	µg/L	J	The MS and/or MSD recovery(ies) were outside the acceptable limits indicating possible matrix interference.

Analyte	Field Sample ID	Lab Sample ID	Result	Units	Reviewer Qualifier	Reviewer Qualifier Reason
Zinc, Dissolved	CPS-7A	10158290004	4650	µg/L	J	The MS and/or MSD recovery(ies) were outside the acceptable limits indicating possible matrix interference.
Zinc, Dissolved	CPS-8	10158290005	361	µg/L	J	The MS and/or MSD recovery(ies) were outside the acceptable limits indicating possible matrix interference.
Zinc, Dissolved	CPSW-1	10158290006	184	µg/L	J	The MS and/or MSD recovery(ies) were outside the acceptable limits indicating possible matrix interference.
Zinc, Dissolved	CPSW-2	10158290007	199	µg/L	J	The MS and/or MSD recovery(ies) were outside the acceptable limits indicating possible matrix interference.
Zinc, Dissolved	NORTH RUNOFF	10158290008	1310	µg/L	J	The MS and/or MSD recovery(ies) were outside the acceptable limits indicating possible matrix interference.
Zinc, Dissolved	ROAD CUT	10158290013	9.2	µg/L	J	The MS and/or MSD recovery(ies) were outside the acceptable limits indicating possible matrix interference.
Zinc, Dissolved	TSP-10	10158290009	17.1	µg/L	J	The MS and/or MSD recovery(ies) were outside the acceptable limits indicating possible matrix interference.

ATTACHMENT A-3

DATA VALIDATION REPORT FOR DATA SETS 10160673, 10160707, AND 10160756

Tier II Data Validation Report Summary

Client: Montana Department of Environmental Quality (MDEQ)	Laboratory: Pace Analytical Services, Inc. – Billings, Montana
Project Name: Black Pine Mine	Sample Matrix: Surface Water and Soil
Project Number: 776-012-002	Sample Start Date: 6/13/2011
Date Validated: 9/6/2011	Sample End Date: 6/16/2011
Parameters Included: Total Recoverable Metals (Sb, As, Ba, Cd, Cr, Co, Cu, Fe, Pb, Mn, Ni, and Zn) by Environmental Protection Agency (EPA) Method 200.8, Total Recoverable Metals (Sb, As, Ba, Cd, Cr, Cu, Fe, Pb, Mn, Ni, Ag, and Zn) by Method 6020, Mercury by Solid Waste 846 (SW-846) Methods 7470A and 7471A, Low Level Mercury by Method 1631E, Acidity by Method Standard Method (SM) 2310, Total Suspended Solids (TSS) by SM 2540D, Sulfate by EPA Method 300.0 IC Anions, Alkalinity, Total as $CaCO_3$ by SM2320B, Total Dissolved Solids (TDS) by SM 2540C, Total Hardness by SM 2340 B, and Percent Moisture by USEPA CLP Method	
Laboratory Project ID: 10160756, 10160707, and 10160673, Low Level Mercury in 10160851 and 10160853	
Data Validator: Nella Dagnillo, Chemical Engineer, E.I.T.	

DATA EVALUATION CRITERIA SUMMARY

A Tier II Data Validation was performed by Trihydro Corporation's Chemical Data Evaluation Services Group on the analytical data report package generated by Pace Analytical Services, Inc., evaluating samples from the Black Pine Mine site, located in Granite, Montana.

Precision, accuracy, method compliance, and completeness of this data package were assessed during this data review. Precision was determined by evaluating the calculated relative percent difference (RPD) values of samples from field and laboratory duplicate pairs. Laboratory accuracy was established by reviewing the demonstrated percent recoveries of matrix spike (MS) and matrix spike duplicate (MSD) samples, and of laboratory control samples (LCS) and laboratory control sample duplicate (LCSD) verify that data are not biased. Additionally, field accuracy was established by collecting field, trip, and equipment blanks to monitor for possible ambient or cross contamination during sampling. Method compliance was established by reviewing holding times, detection limits, surrogate recoveries, method blanks, and the LCS and LCSD percent recoveries against method-specific requirements. Completeness was evaluated by determining the overall ratio of the number of samples planned versus the number of samples with valid analyses. Determination of completeness included a review of the chain-of-custody (CoC), laboratory analytical methods, and other necessary documents associated with this analytical data set.

Data were evaluated in general accordance with validation criteria set forth in the United States Environmental Protection Agency (USEPA) Contract Laboratory Program (CLP) National Functional Guidelines for Inorganic Superfund Data Review, document number EPA 540R-10-011, January 2010.

Tier II Data Validation Report Summary

SAMPLE NUMBERS TABLE

Client Sample ID	Laboratory Sample Number
Data Set 10160756	
CML-SW-14	10160756001
CML-SW-19	10160756002
CML-SW-02	10160756003
CML-Q1-T2	10160756004
CML-SW-01	10160756005
CML-SW-09	10160756006
CML-SD-15-00	10160756007
CML-SD-13-00	10160756008
CML-SD-13-00	10160756008
CML-SD-17-00	10160756009
CML-SD-14-00	10160756010
CML-SD-16-00	10160756011
Data Set 10160707	
TSP-8	10160707001
BP-TS-SD-01-00	10160707002
CML-SW-06	10160707003
CML-SD-06-00	10160707004
TSP-3	10160707005
BP-TS-SD-02-00	10160707006
TSP-9	10160707007
MCSP-1	10160707008
HM-SD-01	10160707009
Data Set 10160673	
BP-CML-SD-04-00	10160673001
BP-CML-SD-05-00	10160673002
BP-CML-SD-03-00	10160673003
TSP-6	10160673004
CML-SW-17	10160673005
CML-SW-18	10160673006
CML-SD-09	10160673007
CML-SD-10	10160673008
CML-SD-07	10160673009
CML-SD-08	10160673010
CML-SD-11	10160673011
CML-SD-01	10160673012
CML-SD-02	10160673013
BP-CML-SD-03-00	10160673014

Tier II Data Validation Report Summary

Client Sample ID	Laboratory Sample Number
Data Set 10160851	
CML-SW-17	10160851001
TSP-6	10160851002
TSP-8	10160851003
TSP-3	10160851005
TSP-9	10160851006
FIELD BLANK 1	10160851007
MCSP-1	10160851008
CML-SW-06	10160851009
Data Set 10160853	
CML-SW-09	10160853001
CML-SW-14	10160853004
CML-SW-01	10160853006
CML-SW-18	1016083008
CML-SW-02	10160853013
CML-SW-19	10160853015
FIELD_BLANK_2	10160853016

Tier II Data Validation Report Summary

The samples were analyzed for the required analytes. Assessment of CoC completeness is included in Section #3. The laboratory data were reviewed to evaluate compliance with the required methods and the quality of the reported data. A leading check mark (✓) indicates that the referenced validation criteria were deemed acceptable. A preceding crossed circle (⊗) indicates validation criteria for which the data may have been qualified by the data validator. Details are noted in the tables below.

Validation Criteria

- ✓ Data Completeness
- ✓ CoC Documentation
- ✓ Holding Times and Preservation
- ✓ Laboratory Blanks
- ✓ LCS/LCSD
- ⊗ MS/MSD
- ✓ Laboratory Duplicates
- ⊗ Field Duplicates
- ⊗ Equipment Rinsate

OVERALL DATA PACKAGE ASSESSMENT

Based on a data validation review, the data are acceptable as delivered; exceptions (i.e., rejected data) are noted below. Data qualified by the laboratory are discussed in Section #2.

The purpose of validating data and assigning qualifiers is to assist in proper data interpretation. Data which are not qualified meet the site data quality objectives. If values are assigned qualifiers other than an R (rejected, data not usable), the data may be used for site evaluation, with the reasons for qualification being given consideration when interpreting sample concentrations. Data points which are assigned an R qualifier should not be used for site evaluation purposes. Text identified in **bold font** indicates that further action and/or qualification of the data were required. Data validation qualifiers were added for the items noted with crossed circles, above. Please see the Data Qualification Summary table at the end of this report for a complete list of samples and analytes qualified.

Data qualifiers used during this validation included:

J – Estimated concentration

UJ – Estimated reporting limit

U – Evaluated to be undetected at the reporting limit

JB – Estimated concentration due to blank contamination

Data Completeness

The analyses were performed as requested on the CoC records. The associated samples were received by the laboratory and analyzed properly. No data points were rejected. The data completeness measure for this data package is 100% and is acceptable.

VALIDATION CRITERIA CHECKLIST	
1. Was the report free of non-conformances related to the analytical data identified by the laboratory?	No
Comments: The laboratory noted the following non-conformances within the case narrative of the laboratory reports: <u>200.8:</u> 10160756, 10160707, and 10160673: Several matrix spike recoveries were outside of the laboratory quality control (QC) limits. <u>6020:</u> 10160756, 10160707, and 10160673: Several matrix spike recoveries were outside of the laboratory QC limits. In addition, in data set 10160756, one analyte concentration exceeded the calibration range in the MS. <u>7471:</u> 10160756, 10160707, and 10160673: Several matrix spike recoveries were outside of the laboratory QC limits. <u>300.0:</u> 10160673: One laboratory duplicate RPD exceeded the laboratory QC limits. <u>2320B:</u> 10160756, 10160707, and 10160673: Several matrix spike recoveries were outside of the laboratory QC limits.	
2. Were data qualification flags or other notes used by the laboratory? If yes, define.	Yes
Comments: The laboratory included the following flags within the report: M1: MS recovery exceeded QC limits. Batch accepted based on LCS recovery. M6: MS and MSD recovery not evaluated against control limits due to sample dilution. D6: The RPD between the sample and sample duplicate exceeded laboratory control limits. E: Analyte concentration exceeded the calibration range. The reported result is estimated. M0: MS recovery and/or MSD recovery was outside laboratory control limits. R3: RPD value was outside control limits due to uncertainty of values at or near the project reporting limit.	
3. Were sample CoC forms complete?	Yes
Comments: The laboratory noted that a CoC form was not provided with the samples. The laboratory identified the samples using the information on the bottle labels.	
4. Were detection limits in accordance with the quality assurance project plan (QAPP), permit, or method, or indicated as acceptable?	Yes
Comments: Detection limits and dilutions were reviewed, and were acceptable. Dilution levels were not noted within the reports, but were recorded in the electronic data deliverables. <u>10160756:</u> Dilutions ranging from 20 times were required for Method 6020 in samples CML-SD-15-00, CML-SD-13-00, CML-SD-17-00, CML-SD-14-00, and CML-SD-16-00. A dilution of 20 times was required for Method 7471 in samples CML-SD-15-00, CML-SD-13-00, CML-SD-17-00, CML-SD-14-00, and CML-SD-16-00. <u>10160707:</u> Dilutions ranging from 20 to 1000 were required for Method 6020 in sample BP-TS-SD-01-00, CML-SD-06, BP-TS-SD-02, and HM-SD-01. A dilution of 20 times was required for Method 7471 for samples BP-TS-SD-02-00, CML-SD-06, and HM-SD-01. A dilution of 2 times was required for Method 300.0 for samples CML-SW-06, TSP-3, TSP-8, TSP-9, and MCSP-1. <u>10160673:</u> Dilutions ranging from 20 to 200 were required for Method 6020 in sample BP-TS-SD-03, BP-CML-SD-03, CML-SD-17-00, CML-SD-14-00, and CML-SD-16-00. A dilution of 20 times was required for Method 7471 for samples CML-SD-15-00, CML-SD-13-00, CML-SD-17-00, CML-SD-14-00, and CML-SD-16-00.	
5. Were the requested analytical methods in compliance with the QAPP, permit, or CoC?	Yes
Comments: The analytical methods were in accordance with project requirements.	

VALIDATION CRITERIA CHECKLIST	
6. Were samples received in good condition within method specified requirements?	No
Comments: The samples were received intact, and in good condition with cooler temperatures within the 4°C +/- 2°C acceptance range from 1.8°C to 4.6°C as noted on the Sample Condition Upon Receipt. Some samples were below the lower recovery limit of 2.0°C; however, samples were received at the laboratory intact and samples were not frozen; therefore, results were accepted.	
7. Were samples analyzed within method specified or technical holding times?	Yes
Comments: Samples were analyzed within the method specified holding times.	
8. Were reported units appropriate for the sample matrix/matrices and method(s) of analyses?	Yes
Comments: Results were reported in units of µg/L, mg/L, mg/kg, and percent moisture. These units were acceptable for the reported sample matrix and analyses.	
9. Do the laboratory reports include all constituents requested to be reported?	Yes
Comments: Reported constituents were in accordance with project requirements.	
10. Was there indication from the laboratory that the initial or continuing calibration verification results were within acceptable limits?	Yes
Comments: Calibration results were not reported with samples of this data set. However, it is assumed that calibration results were acceptable since the laboratory did not report non-conformances.	
11. Was the total number of laboratory blank samples prepared equal to at least 5% of the total number of samples, or analyzed as required by the method?	Yes
Comments: Laboratory blanks were reported on a greater than 5% basis for all methods. Quality control data were neither provided nor required for the analysis of total hardness.	
12. Were laboratory blank samples free of analyte contamination?	Yes
Comments: Laboratory blank samples were free of analyte contamination.	

VALIDATION CRITERIA CHECKLIST

13. Was the total number of matrix spike samples prepared equal to at least 5% of the total number of samples, or analyzed as required by the method? No

Comments: Matrix spikes were reported on a greater than 5% basis, with the following exception. Matrix spikes were not prepared nor were required for TSS, TDS, and acidity. These data were validated using sample duplicates.

10160756: Matrix spikes for Method 200.8 batch MPRP/26758 were prepared from samples not associated with this sampling event and from sample CML-SW-01. Matrix spikes for Method 6020 batch MPRP/26730 were prepared from samples not associated with this sampling event. Matrix spikes for Method 7471 batch MERP/5556 were prepared from samples not associated with this sampling event. Matrix spikes for Method EPA 300.0 batch MT/6256 were prepared from samples not associated with this sampling event. Matrix spikes for Method MT/6264 were prepared from sample CML-SW-09 of data set 10160756 and from a sample not associated with this sampling event. Matrix spikes for Method WET/22702 were prepared from samples not associated with this sampling event.

10160707: Matrix spikes for Method 200.8 batch MPRP/26726 were prepared from sample CML-SW-07 of data set 10160655 and TSP-6 of data set 10160673. Matrix spikes for Method 6020 batch MPRP/26729 were prepared from samples BP-CML-SD-04-00 and BP-CML-SD-03-00 of data set 10160673. Matrix spikes for Method 7471 batch MERP/5542 were prepared from samples BP-CML-SD-04-00 of data set 10160673 and sample HM-SD-01 of data set 10160707. Matrix spikes for Method 300.0 batch MT/6253 were prepared from samples not associated with this sampling event. Matrix spikes for Method SM 2320B batch WET/22674 were prepared from sample TSP-8 and a sample not associated with this sampling event.

10160673: Matrix spikes for Method 200.8 batch MPRP/26726 were prepared from a sample CML-SW-07 of data set 101460655 and TSP-6 of data set 10160673. Matrix spikes for Method 6020 batch MPRP/26729 were prepared from samples BP-CML-SD-04-00 and BP-CML-SD-03-00 of data set 10160673. Matrix spikes for Method 7471 batch MERP/5542 were prepared from samples BP-CML-SD-04-00 of data set 10160673 and sample HM-SD-01 of data set 10160707. Matrix spikes for Method 300.0 batch MT/6195 were prepared from sample samples not associated with this sampling event. Matrix spikes for Method SM 2320B batch WET/22674 were prepared from sample TSP-8 of data set 10160707 and a sample not associated with this sampling event.

Data Set 10160851: Matrix spikes for Method 1631E batch L-062811-2-A were prepared from other client's samples.

Data Set 10160853: Matrix spikes for Method 1631E batch L-062811-A were prepared from other client's samples.

Quality control data were neither provided nor required for the analysis of total hardness.

14. Were MS/MSD percent recoveries and MS/MSD RPDs within data validation or laboratory QC limits? No

Comments: Matrix spike samples prepared from non-project samples were outside of QC limits in some batches. However, data were not qualified since matrix similarity to project samples could not be guaranteed. The following matrix spikes associated with client results were outside of the laboratory QC limits.

10160707 and 10160673: Matrix spikes for iron in metals batch MPRP/26726 prepared from sample CML-SW-07 of data set 10160655 were outside of the laboratory QC limits of 70-130% at 138% and 147%. Also, the matrix spike for iron in metals batch MPRP/26726 prepared from sample TSP-6 of data set 10160673 was outside of the laboratory QC limits of 70-130% at 131%. **As a result, detections in associated samples (TSP-8, CML-SW-06, TSP-3, TSP-9, and MCSP-1) were flagged J due to a possible high bias.**

Several matrix spikes and duplicate RPDs were outside of the laboratory QC limits in batch MPRP/26729; the RPD for cadmium (25%) exceeded the upper limit of 20%. As a result, the associated data were J or UJ qualified due evidence to poor precision.

The matrix spike recovery for cobalt was outside of the data validation QC limits of 75-125% at 128% for the matrix spike prepared from sample BP-CML-SD-03-00 in batch MPRP/26729. As a result, detections in associated samples were flagged J due to a possible high bias.

10160756: The MS recovery for iron in batch MPRP/26758 was at 131% and outside of the 70-130%. **The RPD was also high at 26%, greater than the limit of 20%. The associated data were qualified J due to evidence of a high bias and J/UJ due to evidence of poor precision.**

VALIDATION CRITERIA CHECKLIST	
15. Was the total number of LCSs analyzed equal to at least 5% of the total number of samples, or analyzed as required by the method?	Yes
Comments: Laboratory control samples were analyzed on a greater than 5% basis for all analyses. Laboratory control samples were not prepared nor were required for the analysis of acidity. Quality control data were neither provided nor required for the analysis of total hardness.	
16. Were LCS/LCSD percent recoveries and LCS/LCSD RPDs within data validation or laboratory QC limits?	Yes
Comments: The LCS recoveries were within laboratory QC limits.	
17. Were surrogate recoveries within laboratory QC limits?	N/A
Comments: Surrogate spikes were not required for the methods of this data set. Quality control data were neither provided nor required for the analysis of total hardness.	
18. Was the number of equipment, trip, or field blanks collected equal to at least 10% of the total number of samples, or as required by the project guidelines, QAPP, SAP, or permit?	No
Comments: Equipment and trip blanks were not collected with the samples of this sample set. One rinsate blank (BP-QC-WT-T1) was collected for this sampling period in data set 10163606 to evaluate possible equipment sources of contamination. Two field blanks were collected for low level mercury to evaluate possible ambient field sources of contamination. Sample FIELD BLANK 1 was reported in data set 10160851, and sample FIELD BLANK 2 was reported in data set 10160853.	
19. Were the trip blank, field blank, and/or equipment blank samples free of analyte contamination?	No
Comments: Detections were not reported in the rinsate blank, with the following exception. **Total recoverable lead was detected at 0.47 µg/L in the rinsate blank. Where detected at less than the laboratory reporting limit or the rinsate blank detection in associated samples, total recoverable lead was qualified as U to indicate it was estimated below the reporting limits. Detections greater than the rinsate blank detection and reporting limits, but less than 10 times the rinsate blank detection, were qualified as JB to indicate estimated concentrations due to possible field equipment contamination.**	
20. Was the number of field duplicates collected equal to at least 10% of the total number of samples, or as required by the project guidelines, QAPP, SAP, or permit?	Yes
Comments: Data Set 10160756: One field duplicate was collected with sample of this data set. Sample CML-Q1-T2 was collected as a duplicate of sample CML-SW-02.	
21. Were field duplicate RPD values within data validation QC limits (soil 0-50%, water 0-30%, or air 0-25%)?	No
Comments: Field duplicates were not collected with the sample of this data set, with the following exceptions. **Field duplicates RPD values for antimony, arsenic, chromium, copper, iron, lead, and manganese were above the data validation QC limits of 30% at 26.70%, 40%, 43.10%, 34.30%, 28.90%, 134%, and 41.90%, respectively. As a result, associated data were flagged J for the parent and duplicate samples. Data for total lead were flagged J and UJ for the entire sample set since the RPD value was extremely high (above 100%).**	

VALIDATION CRITERIA CHECKLIST

22. Were laboratory duplicate RPD values within laboratory QC limits? No

Comments: Laboratory duplicate samples prepared from non-project samples were outside of QC limits in some batches. However, data were not qualified since laboratory duplicate similarity to project samples could not be guaranteed. The following laboratory duplicates associated with client results were outside of the laboratory QC limits.

10160756: Laboratory duplicates for % Moisture batch MPRP/26864 were prepared from samples CML-SD-11 of data set 10160673 and CML-SD-16-00 of data set 10160756. Laboratory duplicates for Method SM 2310 batch MT/6229 were prepared from samples not associated with this sampling event. Laboratory duplicates for Method SM 2540D batch MT/6193 was prepared from samples not associated with this sampling event. Laboratory duplicates for Method 300.0 batch MT/6256 were prepared from samples not associated with this sampling event. Laboratory duplicates for Method 300.0 batch MT/6264 were prepared from samples not associated with this sampling event.

10160707: Laboratory duplicates for percent moisture batch MPRP/26864 were prepared from samples CML-SD-11 of 10160673 and CML-SD-16-00 of data set 10160756. Laboratory duplicates for Method SM 2310 batch MT/6228 were prepared from sample BP-CML-SW-08 of data set 10160655. Laboratory duplicates for Method SM 2540D batch MT/6192 were prepared from samples CML-SW-18 of data set 10160673 and CML-SW-16 of data set 10160655. Laboratory duplicates for Method 300.0 batch MT/6253 were prepared from samples not associated with this sampling event. Laboratory duplicates for Method SM 2320B batch WET/22674 were prepared from samples TSP-8 and of a sample not associated with this sampling event. Laboratory duplicates for Method SM 2540C batch WET/22678 were prepared from samples TSP-8 and CML-SW-03 of data set 10160655.

10160673: Laboratory duplicates for percent moisture batch MPRP/26859 were prepared from samples CML-SD-08 of 10160673. Laboratory duplicates for percent moisture batch MPRP/26864 were prepared from samples CML-SD-11 of 10160673 and CML-SD-16-00 of data set 10160756. Laboratory duplicates for Method SM 2310 batch MT/6228 were prepared from sample BP-CML-SW-08 of data set 10160655. Laboratory duplicates for Method SM 2540D batch MT/6192 were prepared from samples CML-SW-18 of data set 10160673 and CML-SW-16 of data set 10160655. Laboratory duplicates for Method 300.0 batch MT/6195 were prepared from samples not associated with this data set. Laboratory duplicates for Method SM 2540C batch WET/22678 were prepared from samples TSP-8 and CML-SW-03 of data set 10160655.

Laboratory duplicates were not prepared for the analyses of low level mercury in data sets 10160851 and 10160853.

Quality control data were neither provided nor required for the analysis of total hardness.

FIELD DUPLICATE SUMMARY

Client Sample ID: CML-SW-02 Field Duplicate Sample ID: CML-Q1-T2			
Analyte	**Laboratory Result (µg/L)**	**Duplicate Result (µg/L)**	**Relative Percent Difference (RPD)**
Antimony, Total Recoverable	**1.70**	**1.30**	**26.70%**
Arsenic, Total Recoverable	**1.20**	**0.80**	**40%**
Barium, Total Recoverable	43.5	41.3	5.20%
Cadmium, Total Recoverable	0.095	ND (0.08)	DL
Chromium, Total Recoverable	**0.71**	**1.10**	**43.10%**
Copper, Total Recoverable	**14.0**	**9.90**	**34.30%**
Iron, Total Recoverable	**420.**	**562.**	**28.90%**
Lead, Total Recoverable	**5.1**	**1.0**	**134%**
Nickel, Total Recoverable	0.77	0.85	9.9%/+/- RL
Manganese, Total Recoverable	**10.40**	**6.80**	**41.90%**
Zinc, Total Recoverable	7.00	5.90	17.1%/+/- RL

Field duplicate RPD control limits are not to exceed 30% for water, 50% for soil, or 25% for air or vapor as established by USEPA Region 1 Laboratory Data Validation Function Guidelines for Evaluation of Organic Analysis, December 1996.

Field duplicates RPD values for antimony, arsenic, chromium, copper, iron, lead, and manganese were above the data validation QC limits of 30% at 26.70%, 40%, 43.10%, 34.30%, 28.90%, 134%, and 41.90%, respectively. As a result, associated data were flagged J for the parent and duplicate samples. Data for total lead were flagged J and UJ for the entire sample set since the RPD value was extremely high (above 100%).

DATA QUALIFICATION SUMMARY

Analyte	Field Sample ID	Lab Sample ID	Result	Units	Reviewer Qualifier	Reviewer Qualifier Reason
Antimony, Total Recoverable	CML-Q1-T2	10160756004	1.3	µg/L	J	High field duplicate RPD value
Antimony, Total Recoverable	CML-SW-02	10160756003	1.7	µg/L	J	High field duplicate RPD value
Arsenic, Total Recoverable	CML-Q1-T2	10160756004	0.8	µg/L	J	High field duplicate RPD value
Arsenic, Total Recoverable	CML-SW-02	10160756003	1.2	µg/L	J	High field duplicate RPD value
Chromium, Total Recoverable	CML-Q1-T2	10160756004	1.1	µg/L	J	High field duplicate RPD value
Chromium, Total Recoverable	CML-SW-02	10160756003	0.71	µg/L	J	High field duplicate RPD value
Copper, Total Recoverable	CML-Q1-T2	10160756004	9.9	µg/L	J	High field duplicate RPD value
Copper, Total Recoverable	CML-SW-02	10160756003	14	µg/L	J	High field duplicate RPD value
Iron, Total Recoverable	CML-Q1-T2	10160756004	562	µg/L	J	The MS and/or MSD recovery(ies) were above the acceptable limits indicating possible matrix interference.
Iron, Total Recoverable	CML-SW-01	10160756005	617	µg/L	J	The MS and/or MSD recovery(ies) were above the acceptable limits indicating possible matrix interference.
Iron, Total Recoverable	CML-SW-02	10160756003	420	µg/L	J	The MS and/or MSD recovery(ies) were above the acceptable limits indicating possible matrix interference.
Iron, Total Recoverable	CML-SW-09	10160756006	406	µg/L	J	The MS and/or MSD recovery(ies) were above the acceptable limits indicating possible matrix interference.
Iron, Total Recoverable	CML-SW-14	10160756001	442	µg/L	J	The MS and/or MSD recovery(ies) were above the acceptable limits indicating possible matrix interference.

Analyte	Field Sample ID	Lab Sample ID	Result	Units	Reviewer Qualifier	Reviewer Qualifier Reason
Iron, Total Recoverable	CML-SW-19	10160756002	308	µg/L	J	The MS and/or MSD recovery(ies) were above the acceptable limits indicating possible matrix interference.
Lead, Total Recoverable	CML-Q1-T2	10160756004	1	µg/L	JB	Equipment blank detection
Lead, Total Recoverable	CML-SW-01	10160756005	3.8	µg/L	JB	Equipment blank detection
Lead, Total Recoverable	CML-SW-02	10160756003	5.1	µg/L	J	High field duplicate RPD value
Lead, Total Recoverable	CML-SW-09	10160756006	2.9	µg/L	JB	Equipment blank detection
Lead, Total Recoverable	CML-SW-14	10160756001	0.36	µg/L	U	Equipment blank detection
Lead, Total Recoverable	CML-SW-19	10160756002	0.37	µg/L	U	Equipment blank detection
Manganese, Total Recoverable	CML-Q1-T2	10160756004	6.8	µg/L	J	High field duplicate RPD value
Manganese, Total Recoverable	CML-SW-02	10160756003	10.4	µg/L	J	High field duplicate RPD value
Cadmium, Total Recoverable	BP-TS-SD-01-00	10160707002	9.1	mg/kg	J	The RPD for the MS/MSD or LCS/LCSD was greater than the acceptable difference indicating poor repeatability.
Cadmium, Total Recoverable	BP-TS-SD-02-00	10160707006	1.1	mg/kg	J	The RPD for the MS/MSD or LCS/LCSD was greater than the acceptable difference indicating poor repeatability.
Cadmium, Total Recoverable	CML-SD-06-00	10160707004	28.6	mg/kg	J	The RPD for the MS/MSD or LCS/LCSD was greater than the acceptable difference indicating poor repeatability.
Cadmium, Total Recoverable	HM-SD-01	10160707009	4.9	mg/kg	J	The RPD for the MS/MSD or LCS/LCSD was greater than the acceptable difference indicating poor repeatability.
Iron, Total Recoverable	CML-SW-06	10160707003	117	µg/L	J	The MS and/or MSD recovery(ies) were above the acceptable limits indicating possible matrix interference.
Iron, Total Recoverable	MCSP-1	10160707008	1080	µg/L	J	The MS and/or MSD recovery(ies) were above the acceptable limits indicating possible matrix interference.
Iron, Total Recoverable	TSP-3	10160707005	1180	µg/L	J	The MS and/or MSD recovery(ies) were above the acceptable limits indicating possible matrix interference.

Analyte	Field Sample ID	Lab Sample ID	Result	Units	Reviewer Qualifier	Reviewer Qualifier Reason
Iron, Total Recoverable	TSP-8	10160707001	2130	µg/L	J	The MS and/or MSD recovery(ies) were above the acceptable limits indicating possible matrix interference.
Iron, Total Recoverable	TSP-9	10160707007	2780	µg/L	J	The MS and/or MSD recovery(ies) were above the acceptable limits indicating possible matrix interference.
Lead, Total Recoverable	MCSP-1	10160707008	2.9	µg/L	JB	Equipment blank detection
Lead, Total Recoverable	TSP-3	10160707005	0.86	µg/L	JB	Equipment blank detection
Lead, Total Recoverable	TSP-8	10160707001	1.8	µg/L	JB	Equipment blank detection
Lead, Total Recoverable	TSP-9	10160707007	1.5	µg/L	JB	Equipment blank detection
Lead, Total Recoverable	CML-SW-17	10160673005	0.13	µg/L	U	Equipment blank detection
Lead, Total Recoverable	CML-SW-18	10160673006	0.27	µg/L	U	Equipment blank detection
Lead, Total Recoverable	TSP-6	10160673004	0.97	µg/L	JB	Equipment blank detection
Cobalt, Total Recoverable	BP-CML-SD-04-00	10160673001	19.3	mg/kg	J	The MS and/or MSD recovery(ies) were above the acceptable limits indicating possible matrix interference.
Cobalt, Total Recoverable	BP-CML-SD-05-00	10160673002	8.1	mg/kg	J	The MS and/or MSD recovery(ies) were above the acceptable limits indicating possible matrix interference.
Cobalt, Total Recoverable	BP-CML-SD-03-00	10160673003	10.7	mg/kg	J	The MS and/or MSD recovery(ies) were above the acceptable limits indicating possible matrix interference.
Cobalt, Total Recoverable	CML-SD-09	10160673007	7.8	mg/kg	J	The MS and/or MSD recovery(ies) were above the acceptable limits indicating possible matrix interference.
Cobalt, Total Recoverable	CML-SD-10	10160673008	6.2	mg/kg	J	The MS and/or MSD recovery(ies) were above the acceptable limits indicating possible matrix interference.

Analyte	Field Sample ID	Lab Sample ID	Result	Units	Reviewer Qualifier	Reviewer Qualifier Reason
Cobalt, Total Recoverable	CML-SD-07	10160673009	10.4	mg/kg	J	The MS and/or MSD recovery(ies) were above the acceptable limits indicating possible matrix interference.
Cobalt, Total Recoverable	CML-SD-08	10160673010	6.7	mg/kg	J	The MS and/or MSD recovery(ies) were above the acceptable limits indicating possible matrix interference.
Cobalt, Total Recoverable	CML-SD-11	10160673011	11.5	mg/kg	J	The MS and/or MSD recovery(ies) were above the acceptable limits indicating possible matrix interference.
Cobalt, Total Recoverable	CML-SD-01	10160673012	7.6	mg/kg	J	The MS and/or MSD recovery(ies) were above the acceptable limits indicating possible matrix interference.
Cobalt, Total Recoverable	CML-SD-02	10160673013	10.9	mg/kg	J	The MS and/or MSD recovery(ies) were above the acceptable limits indicating possible matrix interference.
Cobalt, Total Recoverable	BP-CML-SD-03-00	10160673014	7.6	mg/kg	J	The MS and/or MSD recovery(ies) were above the acceptable limits indicating possible matrix interference.
Cobalt, Total Recoverable	BP-TS-SD-01-00	10160707002	6.5	mg/kg	J	The MS and/or MSD recovery(ies) were above the acceptable limits indicating possible matrix interference.
Cobalt, Total Recoverable	CML-SD-06-00	10160707004	7.6	mg/kg	J	The MS and/or MSD recovery(ies) were above the acceptable limits indicating possible matrix interference.
Cobalt, Total Recoverable	BP-TS-SD-02-00	10160707006	11.6	mg/kg	J	The MS and/or MSD recovery(ies) were above the acceptable limits indicating possible matrix interference.
Cobalt, Total Recoverable	HM-SD-01	10160707009	9.8	mg/kg	J	The MS and/or MSD recovery(ies) were above the acceptable limits indicating possible matrix interference.

ATTACHMENT A-4

DATA VALIDATION REPORT FOR DATA SETS 10163246 AND 10163437

Tier II Data Validation Report Summary

Client: Herrera Environmental Consultants	Laboratory: Pace Analytical Services, Inc. – Billings, MT
Project Name: Black Pine Mine Reclamation Phase	Sample Matrix: Soil
Project Number: 776-012-002	Sample Start Date: 07/12/2011
Date Validated: 09/09/2011	Sample End Date: 07/13/2011
Parameters Included: Total Recoverable Metals (Sb, As, Ba, Cd, Co, Cr, Cu, Fe, Pb, Mn, Ni, and Zn) by Method 6020, Mercury by Solid Waste 846 (SW-846) Method 7471A, Acid Base Accounting by Modified Sobek 3.2, pH, Saturated Paste by American Society of Agronomy (ASA) 10-3.2, Specific Conductance Saturated Paste by ASA 10-3.3, Available Phosphorous by ASA 24-5.4 and Standard Methods (SM) 4500, Organic Matter by ASA 29-3.5.2, Available Nitrate by ASA 33-3.2 and EPA 353.2, Coarse Fragment by Former American Society for Testing and Materials (ASTM) D421, Potassium by Contract Laboratory Program (CLP) Inductively Coupled Plasma (ICP) Atomic Emission Spectroscopy (AES) Montana Department of Environmental Quality (MDEQ) Methodology, Cation Exchange Capacity by EPA 9081, and Percent Moisture by USEPA CLP Method	
Laboratory Project ID: 10163246 and 10163437	
Data Validator: Nella Dagnillo, Chemical Engineer, E.I.T.	

DATA EVALUATION CRITERIA SUMMARY

A Tier II Data Validation was performed by Trihydro Corporation's Chemical Data Evaluation Services Group on the analytical data report package generated by Pace Analytical Services, Inc., evaluating samples from the Black Pine Mine site, located in Granite, Montana.

Precision, accuracy, method compliance, and completeness of this data package were assessed during this data review. Precision was determined by evaluating the calculated relative percent difference (RPD) values of samples from field and laboratory duplicate pairs. Laboratory accuracy was established by reviewing the demonstrated percent recoveries of matrix spike (MS) and matrix spike duplicate (MSD) samples, and of laboratory control samples (LCS) and laboratory control sample duplicate (LCSD) verify that data are not biased. Additionally, field accuracy was established by collecting field, trip, and equipment blanks to monitor for possible ambient or cross contamination during sampling. Method compliance was established by reviewing holding times, detection limits, surrogate recoveries, method blanks, and the LCS and LCSD percent recoveries against method-specific requirements. Completeness was evaluated by determining the overall ratio of the number of samples planned versus the number of samples with valid analyses. Determination of completeness included a review of the chain-of-custody (CoC), laboratory analytical methods, and other necessary documents associated with this analytical data set.

Data were evaluated in general accordance with validation criteria set forth in the United States Environmental Protection Agency (USEPA) Contract Laboratory Program (CLP) National Functional Guidelines for Inorganic Superfund Data Review, document number EPA 540R-10-011, January 2010.

Tier II Data Validation Report Summary

SAMPLE NUMBERS TABLE

Client Sample ID	Laboratory Sample Number
10163246	
BP-RY-SS-02-00	10163246001
BP-RY-SS-01-00	10163246002
BP-RY-SS-03-00	10163246003
BP-RY-SS-03-14	10163246004
BP-RY-SS-02-02	10163246005
BP-RY-SS-04-00	10163246006
BP-RY-SS-04-02	10163246007
BP-RY-SS-04-10	10163246008
BP-RY-SS-05-00	10163246009
BP-RY-SS-05-02	10163246010
10163437	
CML-SD-45	10163437001
CML-SD-43	10163437002
CML-SD-40	10163437003
CML-SD-37	10163437004
CML-SD-36	10163437005
CML-SD-34	10163437006
CML-SD-35	10163437007
CML-SD-38	10163437008
CML-SD-41	10163437009
CML-SD-44	10163437010
CML-SD-46	10163437011
CML-SD-33-00	10163437012
CML-SD-33-01	10163437013
CML-SD-32-00	10163437014
CML-SD-31-00	10163437015
CML-SD-31-02	10163437016
CML-SD-29-00	10163437017
CML-SD-28-00	10163437018
CML-SD-27-00	10163437019
CML-SD-24-00	10163437020
CML-SD-24-01	10163437021
CML-SD-25-00	10163437022
CML-SD-26-00	10163437023
CML-SD-21-00	10163437024
CML-SD-20-00	10163437025
CML-SD-20-02	10163437026
CML-SD-42-00	10163437027

Tier II Data Validation Report Summary

Client Sample ID	Laboratory Sample Number
CML-SD-42-02	10163437028
CML-SD-39-00	10163437029
CML-SD-30-00	10163437030
CML-SD-22-00	10163437031
CML-SD-23-00	10163437032
CML-SD-23-02	10163437033
CML-SD-19-00	10163437034
CML-SD-19-02	10163437035
CML-SD-18-00	10163437036

Tier II Data Validation Report Summary

The samples were analyzed for the required analytes. Assessment of CoC completeness is included in Section #3. The laboratory data were reviewed to evaluate compliance with the required methods and the quality of the reported data. A leading check mark (✓) indicates that the referenced validation criteria were deemed acceptable. A preceding crossed circle (⊗) indicates validation criteria for which the data may have been qualified by the data validator. Details are noted in the tables below.

Validation Criteria

- ✓ Data Completeness
- ✓ CoC Documentation
- ✓ Holding Times and Preservation
- ✓ Laboratory Blanks
- ✓ LCSs
- ⊗ MS/MSDs
- ⊗ Laboratory Duplicates
- ✓ Equipment Rinsate

OVERALL DATA PACKAGE ASSESSMENT

Based on a data validation review, the data are acceptable as delivered; exceptions (i.e., rejected data) are noted below. Data qualified by the laboratory are discussed in Section #2.

The purpose of validating data and assigning qualifiers is to assist in proper data interpretation. Data which are not qualified meet the site data quality objectives. If values are assigned qualifiers other than an R (rejected, data not usable), the data may be used for site evaluation, with the reasons for qualification being given consideration when interpreting sample concentrations. Data points which are assigned an R qualifier should not be used for site evaluation purposes. Text identified in **bold font** indicates that further action and/or qualification of the data were required. Data validation qualifiers were added for the items noted with crossed circles, above. Please see the Data Qualification Summary table at the end of this report for a complete list of samples and analytes qualified.

Data qualifiers used during this validation included:

J – Estimated concentration

UJ – Estimated reporting limit

Data Completeness

The analyses were performed as requested on the CoC records. The associated samples were received by the laboratory and analyzed properly. No data points were rejected. The data completeness measure for this data package is 100% and is acceptable.

VALIDATION CRITERIA CHECKLIST	
1. Was the report free of non-conformances related to the analytical data identified by the laboratory?	No
Comments: The laboratory noted the following non-conformances related to the analytical data. <u>6010</u> Data set 10163437: Several MS/MSD recoveries and laboratory duplicate RPDs were outside of the laboratory QC limits. Data set 10163246: Lead was detected in the method blank. All associated samples had concentrations of at least ten times greater than the blank or were below the reporting limit. Several MS/MSD recoveries were not evaluated against the control limits due to sample dilution. <u>6020</u> Data set 10163246: Lead was detected in the method blank. All associated samples had concentrations of at least ten times greater than the blank or were below the reporting limit. Several MS/MSD recoveries were not evaluated against the control limits due to sample dilution. In addition, manganese was flagged in the MS and MSD since the calibration range was exceeded. The reported results were estimated. <u>7471A</u> Data set 10163437: Several MS/MSD recoveries were outside of the laboratory QC limits. Some out of range recoveries were due to a sample dilution. Data set 10163246: Several MS/MSD recoveries were outside of the laboratory QC limits. Some out of range recoveries were due to a sample dilution. <u>ASA 10-3.3</u> Data set 10163246: For the laboratory duplicate analysis, the RPD between the sample and sample duplicate exceeded laboratory control limits.	
2. Were data qualification flags or other notes used by the laboratory? If yes, define.	Yes
Comments: The following data qualifiers were applied to the sample data by the laboratory. D6 – The relative percent difference (RPD) between the sample and sample duplicate exceeded laboratory control limits. E – Analyte concentration exceeded the calibration range. The reported result is estimated. M1 – Matrix spike recovery exceeded QC limits. Batch accepted based on LCS recovery. M6 – Matrix spike and Matrix spike duplicate recovery not evaluated against control limits due to sample dilution. P8 – Analyte was detected in the method blank. All associated samples had concentrations of at least ten times greater than the blank or were below the reporting limit. P6 – Matrix spike recovery was outside laboratory control limits due to a parent sample concentration notably higher than the spike level.	
3. Were sample CoC forms complete?	Yes
Comments: The CoC records from field to laboratory were complete, and custody was maintained as evidenced by field and laboratory personnel signatures, dates, and times of receipt.	

VALIDATION CRITERIA CHECKLIST	
4. Were detection limits in accordance with the quality assurance project plan (QAPP), permit, or method, or indicated as acceptable?	Yes
Comments: Dilutions were applied for several analyses in this sample set. 6010: The samples required dilutions of 5 times. 6020: The samples required dilutions of up to 20 to 100 times for the metals analyses in some samples. 7471A: The samples required dilutions of up to 10 to 100 times for the mercury analyses in some samples. CLP ICP AES MDEQ: Dilutions of 5 times were applied to the analysis of potassium. 9081: Dilutions of 10 times were applied. ASA 24-5.4/SM4500: Dilutions of 2 times were applied for phosphorus. The dilutions were reviewed and were determined to be acceptable for evaluation of laboratory data quality.	
5. Were the requested analytical methods in compliance with the QAPP, permit, or CoC?	Yes
Comments: The analytical methods were in accordance with project requirements.	
6. Were samples received in good condition within method specified requirements?	Yes
Comments: Samples were received on ice, in good condition, with the cooler temperature within the recommended temperature range of 4°C +/- 2°C at 1.9°C to 2.6°C as noted on the Sample Condition Upon Receipt forms. Some sample bottles were received with a temperature below 2°C; however, they were acceptable since the bottles were received intact and samples were not frozen.	
7. Were samples analyzed within method specified or technical holding times?	Yes
Comments: Samples were extracted and analyzed within method specified holding times.	
8. Were reported units appropriate for the sample matrix/matrices and method(s) of analyses?	Yes
Comments: Metals data were reported in units of mg/kg in dry weight for soil analyses. Moisture data were reported in units of percent. Data for the modified Sobek method were reported in units of tons/1000, standard units for pH, and weight percent (%w/w). Specific conductance was reported in units of mmhos/cm, and cation exchange capacity was measured in units of meq/100g. These units are appropriate for the respective methods and for the soil matrix.	
9. Do the laboratory reports include all constituents requested to be reported?	Yes
Comments: Reported constituents were in accordance with the CoC.	
10. Was there indication from the laboratory that the initial or continuing calibration verification results were within acceptable limits?	Yes
Comments: Calibration results were not reported with samples of this data set. However, it is assumed that calibration results were acceptable since the laboratory did not report non-conformances.	
11. Was the total number of laboratory blank samples prepared equal to at least 5% of the total number of samples, or analyzed as required by the method?	Yes
Comments: Laboratory blanks were reported on a greater than 5% basis for all methods, with the exceptions of percent moisture, the SMP buffer pH for the modified Sobek method, and analysis by ASA_10-3.2. Method blanks were not reported nor were required for these analyses.	

VALIDATION CRITERIA CHECKLIST

12. Were laboratory blank samples free of analyte contamination? No

Comments: The method blank samples were reported to be free of analyte contamination with the following exception.

For the analysis of metals by Method 6020 in data set 10163437, iron was detected at 3.1 mg/kg and 2.9 mg/kg in batches MPRP/27174 and MPRP/27175, respectively. Iron in the associated samples was detected at greater than 10 times the amount in the method blank and therefore no further action was required.

For the analysis of metals by Method 6020 in data set 10163246, lead was detected at 0.34 mg/kg in batch MPRP/27163. Lead in the associated samples was detected at greater than 10 times the amount in the method blank; therefore, no further action was required. Data were not qualified since the sample detections were greater than 10 times the blank detections.

13. Was the total number of matrix spike samples prepared equal to at least 5% of the total number of samples, or analyzed as required by the method? Yes

Comments: The total number of MS/MSD samples was equal to at least 5% of the total number of samples for each analysis and batch, with the exceptions of analyses for percent moisture, Modified Sobek 3.2, Method 9081, and the ASA methodologies, which do not require MS/MSDs. The project samples used to prepare the MS and MSD samples are summarized in the table below.

Analysis	Batch	Parent Sample	Parent Data Set
10163246			
6020	MPRP/27163	BP-RY-SS-02-00 and BP-HM-SS-03-03	10163246 and 10163606
7471	MERP/5632	BP-RY-SS-02-00 and BP-HM-SS-15-00	10163246 and 10163483
10163437			
6010B	MPRP/27174	CML-SD-45 and CML-SD-24-00	10163437
6010B	MPRP/27175	CML-SD-18-00	10163437
6010B	MPRP/27175	CML-SD-24-01	10163437
7471	MERP/5637	BP-CML-SD-45 and CML-SD-24-00	10163437
7471	MERP/5638	CML-SD-18-00 and CML-SD-24-01	10163437

VALIDATION CRITERIA CHECKLIST	
14. Were MS/MSD percent recoveries and MS/MSD RPDs within data validation or laboratory QC limits?	No
Comments: Matrix spike samples prepared from non-project samples were outside of QC limits in some batches. However, data were not qualified since matrix similarity to project samples could not be guaranteed. The following matrix spikes associated with client results were outside of the laboratory QC limits. 10163246: Matrix spikes for mercury in batch MERP/5632 sample BP-RY-SS-02-00 were outside of the laboratory QC limits of 70-130% at 31% and 38%. **As a result, associated data were flagged J and UJ due to possible biased results.** 10163437: Matrix spike recoveries for batch MPRP/27174 antimony (48% and 48%), lead (130%-MS), and zinc (138% and 134%) were outside of the laboratory QC limits of 75-125%. Secondly, for matrix spike recoveries in the second MS, antimony (5%) was outside of the laboratory QC limits of 75%-125%. **As a result associated analytes were qualified in associated samples due to out of range percent recoveries.** Matrix spikes for barium, manganese iron in sample CML-SD-45, and for barium, copper, iron, lead, and zinc were outside of the laboratory QC limits also; however, the sample background concentrations were greater than four times the spike concentration for these analytes. For batch MPRP/27175, matrix spike recoveries for antimony (41% and 48%), lead (149%-MSD), and zinc (133%-MSD) were outside of the laboratory QC limits of 75-125%. Secondly, for matrix spike recoveries in the second MS, arsenic (145%), barium (143%), copper (268%), lead (363%), manganese (457%), and zinc (172%) were outside of the laboratory QC limits of 75%-125%. **As a result, associated analytes were qualified in associated samples due to out of range percent recoveries.** Matrix spikes for barium, copper, iron and manganese were outside of the laboratory QC limits also; however, the sample background concentrations were greater than four times the spike concentration for these analytes.	
15. Was the total number of LCSs analyzed equal to at least 5% of the total number of samples, or analyzed as required by the method?	Yes
Comments: The total number of LCSs were equal to at least 5% of the total number of samples, with the exceptions of analyses for percent moisture for the Modified Sobek 3.2 analyses, and for ASA_10-3.2. Analyses of LCSs were neither prepared nor required for these methods.	
16. Were LCS/LCSD percent recoveries and LCS/LCSD RPDs within data validation or laboratory QC limits?	Yes
Comments: The LCS percent recoveries were within laboratory QC limits.	
17. Were surrogate recoveries within laboratory QC limits?	N/A
Comments: Surrogates are not required for the reported methods.	
18. Was the number of equipment, trip, or field blanks collected compliant with the project guidelines, quality assurance project plan (QAPP), sample analysis plan (SAP), or permit?	No
Comments: Equipment, trip, and field blanks were not collected with the samples of this data set. One rinsate blank (BP-QC-WT-T1) was collected for this sampling period in data set 10163606 to evaluate possible equipment sources of contamination.	
19. Were the trip blank, field blank, and/or equipment blank samples free of analyte contamination?	No
Comments: Detections were not reported in the rinsate blank, with the following exception. Total recoverable lead was detected at 0.47 µg/L in the rinsate blank. Qualification was not required since total recoverable lead was detected in the samples at both greater than the reporting limit and greater than ten times the amount in the rinsate blank.	

VALIDATION CRITERIA CHECKLIST

20. Was the number of field duplicates collected compliant with the project guidelines, QAPP, SAP, or permit? No

Comments: Field duplicates were not submitted with the sample sets.

21. Were field duplicate RPD values within data validation QC limits (soil 0-35%)? No

Comments: Field duplicates were not submitted with the sample sets.

22. Were laboratory duplicate RPD values within laboratory QC limits? No

Comments: Laboratory duplicates were not prepared for Methods 6020, CLP ICP AES MDEQ, or 7471A. Laboratory duplicates were prepared for the remaining sample analyses. The project samples used for the laboratory duplicate sample analyses are summarized in the table below.

Data Set	Analysis	Batch	Parent Sample	Data Set
10163437	Moisture	MPRP/27307	CML-SD-32-00	10163437
10163437	Moisture	MPRP/27307	BP-CML-TS-02-00	10163645
10163437	Moisture	MPRP/27310	CML-SD-31-00	10163437
10163437	Moisture	MPRP/27310	CML-SD-19-00	10163437
10163437	Moisture	MPRP/27315	Not Associated	Not Associated
10163437	Moisture	MPRP/27315	Not Associated	Not Associated
10163246	Potassium	MPRP/27469	BP-CMN-SS-08-03	10163134
10163246	Potassium	MPRP/27469	BP-CMN-SS-11	10163644
10163246	Cation Exchange Capacity	ICP/14882	BP-RY-SS-02-00	10163246
10163246	Moisture	MPRP/27229	Not Associated	Not Associated
10163246	Moisture	MPRP/27256	Not Associated	Not Associated
10163246	Moisture	MPRP/27256	BP-HM-SS-04-10	10163606
10163246	Nitrate	MT/6442	BP-RY-SS-03-14	10163246
10163246	Nitrate	MT/6442	BP-CMN-SS-12-04	10163644
10163246	Organic Matter	MT/6438	BP-RY-SS-01-00	10163644
10163246	Organic Matter	MT/6438	BP-CMN-SS-08-03	10163634
10163246	Organic Matter	MT/6460	Not Associated	Not Associated
10163246	pH	MT/6426	BP-RY-SS-03-14	10163246
10163246	pH	MT/6426	BP-CML-TS-11-01	10163645
10163246	Phosphorus	MT/6443	BP-RY-SS-03-14	10163246
10163246	Phosphorus	MT/6443	BP-CMN-SS-13-04	10163644
10163246	Neutralization Potential	MT/6480	BP-HM-RS-03-01	10163606
10163246	Neutralization Potential	MT/6480	BP-RY-SS-04-02	10163246
10163246	Sulfur	MT/6452	BP-HM-RS-03-01	10163606
10163246	Sulfur	MT/6452	BP-RY-SS-04-02	10163246
10163246	SMP Buffer pH	MT/6481	BP-HM-RS-03-01	10163606
10163246	SMP Buffer pH	MT/6481	BP-RY-SS-04-02	10163246
10163246	Specific Conductivity	MT/6547	BP-RY-SS-03-14	10163246
10163246	Specific Conductivity	MT/6547	BP-CML-TS-11-01	10163645

The laboratory duplicate RPD values were within laboratory QC limits, or were not applicable since one or both sample results were either non-detect or were detected at less than five times the laboratory reporting limit, with the following exception.

The RPD for the analysis of specific conductance in saturate paste, ASA method 10-3.3, in data set 10163246, was outside of laboratory QC limits of 0-20% at 33%. Associated sample data were qualified as J or as UJ due to possible poor precision.

DATA QUALIFICATION SUMMARY

Analyte	Field Sample ID	Lab Sample ID	Result	Units	Reviewer Qualifier	Reviewer Qualifier Reason
Mercury, Total	BP-RY-SS-01-00	10163246002	0.025	mg/kg	J	The MS and/or MSD recovery(ies) were outside the acceptable limits indicating possible matrix interference.
Mercury, Total	BP-RY-SS-02-00	10163246001	0.14	mg/kg	J	The MS and/or MSD recovery(ies) were outside the acceptable limits indicating possible matrix interference.
Mercury, Total	BP-RY-SS-02-02	10163246005	ND (0.024)	mg/kg	UJ	The MS and/or MSD recovery(ies) were outside the acceptable limits indicating possible matrix interference.
Mercury, Total	BP-RY-SS-03-00	10163246003	0.062	mg/kg	J	The MS and/or MSD recovery(ies) were outside the acceptable limits indicating possible matrix interference.
Mercury, Total	BP-RY-SS-03-14	10163246004	0.069	mg/kg	J	The MS and/or MSD recovery(ies) were outside the acceptable limits indicating possible matrix interference.
Mercury, Total	BP-RY-SS-04-00	10163246006	ND (0.021)	mg/kg	UJ	The MS and/or MSD recovery(ies) were outside the acceptable limits indicating possible matrix interference.
Mercury, Total	BP-RY-SS-04-02	10163246007	0.33	mg/kg	J	The MS and/or MSD recovery(ies) were outside the acceptable limits indicating possible matrix interference.
Mercury, Total	BP-RY-SS-04-10	10163246008	0.18	mg/kg	J	The MS and/or MSD recovery(ies) were outside the acceptable limits indicating possible matrix interference.
Mercury, Total	BP-RY-SS-05-00	10163246009	ND (0.019)	mg/kg	UJ	The MS and/or MSD recovery(ies) were outside the acceptable limits indicating possible matrix interference.
Mercury, Total	BP-RY-SS-05-02	10163246010	ND (0.022)	mg/kg	UJ	The MS and/or MSD recovery(ies) were outside the acceptable limits indicating possible matrix interference.
Specific Conductance, Saturated Paste	BP-RY-SS-01-00	10163246002	0.17	mmhos/cm	J	Laboratory duplicate RPD outside QC limits

Analyte	Field Sample ID	Lab Sample ID	Result	Units	Reviewer Qualifier	Reviewer Qualifier Reason
Specific Conductance, Saturated Paste	BP-RY-SS-02-00	10163246001	0.33	mmhos/cm	J	Laboratory duplicate RPD outside QC limits
Specific Conductance, Saturated Paste	BP-RY-SS-02-02	10163246005	0.12	mmhos/cm	J	Laboratory duplicate RPD outside QC limits
Specific Conductance, Saturated Paste	BP-RY-SS-03-00	10163246003	0.067	mmhos/cm	J	Laboratory duplicate RPD outside QC limits
Specific Conductance, Saturated Paste	BP-RY-SS-03-14	10163246004	0.091	mmhos/cm	J	Laboratory duplicate RPD outside QC limits
Specific Conductance, Saturated Paste	BP-RY-SS-04-00	10163246006	0.14	mmhos/cm	J	Laboratory duplicate RPD outside QC limits
Specific Conductance, Saturated Paste	BP-RY-SS-04-02	10163246007	0.1	mmhos/cm	J	Laboratory duplicate RPD outside QC limits
Specific Conductance, Saturated Paste	BP-RY-SS-04-10	10163246008	0.12	mmhos/cm	J	Laboratory duplicate RPD outside QC limits
Specific Conductance, Saturated Paste	BP-RY-SS-05-00	10163246009	0.19	mmhos/cm	J	Laboratory duplicate RPD outside QC limits
Specific Conductance, Saturated Paste	BP-RY-SS-05-02	10163246010	0.17	mmhos/cm	J	Laboratory duplicate RPD outside QC limits
Antimony, Total Recoverable	CML-SD-18-00	10163437036	76.1	mg/kg	J	The MS and/or MSD recovery(ies) were outside the acceptable limits indicating possible matrix interference.
Antimony, Total Recoverable	CML-SD-19-00	10163437034	614	mg/kg	J	The MS and/or MSD recovery(ies) were outside the acceptable limits indicating possible matrix interference.

Analyte	Field Sample ID	Lab Sample ID	Result	Units	Reviewer Qualifier	Reviewer Qualifier Reason
Antimony, Total Recoverable	CML-SD-19-02	10163437035	21.1	mg/kg	J	The MS and/or MSD recovery(ies) were outside the acceptable limits indicating possible matrix interference.
Antimony, Total Recoverable	CML-SD-20-00	10163437025	528	mg/kg	J	The MS and/or MSD recovery(ies) were outside the acceptable limits indicating possible matrix interference.
Antimony, Total Recoverable	CML-SD-20-02	10163437026	6.3	mg/kg	J	The MS and/or MSD recovery(ies) were outside the acceptable limits indicating possible matrix interference.
Antimony, Total Recoverable	CML-SD-21-00	10163437024	475	mg/kg	J	The MS and/or MSD recovery(ies) were outside the acceptable limits indicating possible matrix interference.
Antimony, Total Recoverable	CML-SD-22-00	10163437031	28.5	mg/kg	J	The MS and/or MSD recovery(ies) were outside the acceptable limits indicating possible matrix interference.
Antimony, Total Recoverable	CML-SD-23-00	10163437032	40.9	mg/kg	J	The MS and/or MSD recovery(ies) were outside the acceptable limits indicating possible matrix interference.
Antimony, Total Recoverable	CML-SD-23-02	10163437033	38	mg/kg	J	The MS and/or MSD recovery(ies) were outside the acceptable limits indicating possible matrix interference.
Antimony, Total Recoverable	CML-SD-24-00	10163437020	95	mg/kg	J	The MS and/or MSD recovery(ies) were outside the acceptable limits indicating possible matrix interference.
Antimony, Total Recoverable	CML-SD-24-01	10163437021	24	mg/kg	J	The MS and/or MSD recovery(ies) were outside the acceptable limits indicating possible matrix interference.
Antimony, Total Recoverable	CML-SD-25-00	10163437022	184	mg/kg	J	The MS and/or MSD recovery(ies) were outside the acceptable limits indicating possible matrix interference.
Antimony, Total Recoverable	CML-SD-26-00	10163437023	312	mg/kg	J	The MS and/or MSD recovery(ies) were outside the acceptable limits indicating possible matrix interference.

Analyte	Field Sample ID	Lab Sample ID	Result	Units	Reviewer Qualifier	Reviewer Qualifier Reason
Antimony, Total Recoverable	CML-SD-27-00	10163437019	172	mg/kg	J	The MS and/or MSD recovery(ies) were outside the acceptable limits indicating possible matrix interference.
Antimony, Total Recoverable	CML-SD-28-00	10163437018	248	mg/kg	J	The MS and/or MSD recovery(ies) were outside the acceptable limits indicating possible matrix interference.
Antimony, Total Recoverable	CML-SD-29-00	10163437017	706	mg/kg	J	The MS and/or MSD recovery(ies) were outside the acceptable limits indicating possible matrix interference.
Antimony, Total Recoverable	CML-SD-30-00	10163437030	5.6	mg/kg	J	The MS and/or MSD recovery(ies) were outside the acceptable limits indicating possible matrix interference.
Antimony, Total Recoverable	CML-SD-31-00	10163437015	272	mg/kg	J	The MS and/or MSD recovery(ies) were outside the acceptable limits indicating possible matrix interference.
Antimony, Total Recoverable	CML-SD-31-02	10163437016	406	mg/kg	J	The MS and/or MSD recovery(ies) were outside the acceptable limits indicating possible matrix interference.
Antimony, Total Recoverable	CML-SD-32-00	10163437014	463	mg/kg	J	The MS and/or MSD recovery(ies) were outside the acceptable limits indicating possible matrix interference.
Antimony, Total Recoverable	CML-SD-33-00	10163437012	159	mg/kg	J	The MS and/or MSD recovery(ies) were outside the acceptable limits indicating possible matrix interference.
Antimony, Total Recoverable	CML-SD-33-01	10163437013	511	mg/kg	J	The MS and/or MSD recovery(ies) were outside the acceptable limits indicating possible matrix interference.
Antimony, Total Recoverable	CML-SD-34	10163437006	683	mg/kg	J	The MS and/or MSD recovery(ies) were outside the acceptable limits indicating possible matrix interference.
Antimony, Total Recoverable	CML-SD-35	10163437007	293	mg/kg	J	The MS and/or MSD recovery(ies) were outside the acceptable limits indicating possible matrix interference.

Analyte	Field Sample ID	Lab Sample ID	Result	Units	Reviewer Qualifier	Reviewer Qualifier Reason
Antimony, Total Recoverable	CML-SD-36	10163437005	105	mg/kg	J	The MS and/or MSD recovery(ies) were outside the acceptable limits indicating possible matrix interference.
Antimony, Total Recoverable	CML-SD-37	10163437004	88.9	mg/kg	J	The MS and/or MSD recovery(ies) were outside the acceptable limits indicating possible matrix interference.
Antimony, Total Recoverable	CML-SD-38	10163437008	69.3	mg/kg	J	The MS and/or MSD recovery(ies) were outside the acceptable limits indicating possible matrix interference.
Antimony, Total Recoverable	CML-SD-39-00	10163437029	23	mg/kg	J	The MS and/or MSD recovery(ies) were outside the acceptable limits indicating possible matrix interference.
Antimony, Total Recoverable	CML-SD-40	10163437003	11.1	mg/kg	J	The MS and/or MSD recovery(ies) were outside the acceptable limits indicating possible matrix interference.
Antimony, Total Recoverable	CML-SD-41	10163437009	239	mg/kg	J	The MS and/or MSD recovery(ies) were outside the acceptable limits indicating possible matrix interference.
Antimony, Total Recoverable	CML-SD-42-00	10163437027	26.2	mg/kg	J	The MS and/or MSD recovery(ies) were outside the acceptable limits indicating possible matrix interference.
Antimony, Total Recoverable	CML-SD-42-02	10163437028	40.5	mg/kg	J	The MS and/or MSD recovery(ies) were outside the acceptable limits indicating possible matrix interference.
Antimony, Total Recoverable	CML-SD-43	10163437002	20	mg/kg	J	The MS and/or MSD recovery(ies) were outside the acceptable limits indicating possible matrix interference.
Antimony, Total Recoverable	CML-SD-44	10163437010	7.9	mg/kg	J	The MS and/or MSD recovery(ies) were outside the acceptable limits indicating possible matrix interference.
Antimony, Total Recoverable	CML-SD-45	10163437001	2.8	mg/kg	J	The MS and/or MSD recovery(ies) were outside the acceptable limits indicating possible matrix interference.

Analyte	Field Sample ID	Lab Sample ID	Result	Units	Reviewer Qualifier	Reviewer Qualifier Reason
Antimony, Total Recoverable	CML-SD-46	10163437011	8	mg/kg	J	The MS and/or MSD recovery(ies) were outside the acceptable limits indicating possible matrix interference.
Arsenic, Total Recoverable	CML-SD-18-00	10163437036	211	mg/kg	J	The MS and/or MSD recovery(ies) were outside the acceptable limits indicating possible matrix interference.
Arsenic, Total Recoverable	CML-SD-19-00	10163437034	442	mg/kg	J	The MS and/or MSD recovery(ies) were outside the acceptable limits indicating possible matrix interference.
Arsenic, Total Recoverable	CML-SD-19-02	10163437035	43.6	mg/kg	J	The MS and/or MSD recovery(ies) were outside the acceptable limits indicating possible matrix interference.
Arsenic, Total Recoverable	CML-SD-20-00	10163437025	617	mg/kg	J	The MS and/or MSD recovery(ies) were outside the acceptable limits indicating possible matrix interference.
Arsenic, Total Recoverable	CML-SD-20-02	10163437026	29.7	mg/kg	J	The MS and/or MSD recovery(ies) were outside the acceptable limits indicating possible matrix interference.
Arsenic, Total Recoverable	CML-SD-21-00	10163437024	507	mg/kg	J	The MS and/or MSD recovery(ies) were outside the acceptable limits indicating possible matrix interference.
Arsenic, Total Recoverable	CML-SD-22-00	10163437031	58.2	mg/kg	J	The MS and/or MSD recovery(ies) were outside the acceptable limits indicating possible matrix interference.
Arsenic, Total Recoverable	CML-SD-23-00	10163437032	61.6	mg/kg	J	The MS and/or MSD recovery(ies) were outside the acceptable limits indicating possible matrix interference.
Arsenic, Total Recoverable	CML-SD-23-02	10163437033	48.4	mg/kg	J	The MS and/or MSD recovery(ies) were outside the acceptable limits indicating possible matrix interference.
Arsenic, Total Recoverable	CML-SD-24-01	10163437021	30.5	mg/kg	J	The MS and/or MSD recovery(ies) were outside the acceptable limits indicating possible matrix interference.

Analyte	Field Sample ID	Lab Sample ID	Result	Units	Reviewer Qualifier	Reviewer Qualifier Reason
Arsenic, Total Recoverable	CML-SD-25-00	10163437022	232	mg/kg	J	The MS and/or MSD recovery(ies) were outside the acceptable limits indicating possible matrix interference.
Arsenic, Total Recoverable	CML-SD-26-00	10163437023	291	mg/kg	J	The MS and/or MSD recovery(ies) were outside the acceptable limits indicating possible matrix interference.
Arsenic, Total Recoverable	CML-SD-30-00	10163437030	24.9	mg/kg	J	The MS and/or MSD recovery(ies) were outside the acceptable limits indicating possible matrix interference.
Arsenic, Total Recoverable	CML-SD-39-00	10163437029	27.2	mg/kg	J	The MS and/or MSD recovery(ies) were outside the acceptable limits indicating possible matrix interference.
Arsenic, Total Recoverable	CML-SD-42-00	10163437027	37.4	mg/kg	J	The MS and/or MSD recovery(ies) were outside the acceptable limits indicating possible matrix interference.
Arsenic, Total Recoverable	CML-SD-42-02	10163437028	48.7	mg/kg	J	The MS and/or MSD recovery(ies) were outside the acceptable limits indicating possible matrix interference.
Barium, Total Recoverable	CML-SD-18-00	10163437036	793	mg/kg	J	The MS and/or MSD recovery(ies) were above the acceptable limits indicating possible matrix interference.
Barium, Total Recoverable	CML-SD-19-00	10163437034	238	mg/kg	J	The MS and/or MSD recovery(ies) were above the acceptable limits indicating possible matrix interference.
Barium, Total Recoverable	CML-SD-19-02	10163437035	317	mg/kg	J	The MS and/or MSD recovery(ies) were above the acceptable limits indicating possible matrix interference.
Barium, Total Recoverable	CML-SD-20-00	10163437025	430	mg/kg	J	The MS and/or MSD recovery(ies) were above the acceptable limits indicating possible matrix interference.
Barium, Total Recoverable	CML-SD-20-02	10163437026	396	mg/kg	J	The MS and/or MSD recovery(ies) were above the acceptable limits indicating possible matrix interference.

Analyte	Field Sample ID	Lab Sample ID	Result	Units	Reviewer Qualifier	Reviewer Qualifier Reason
Barium, Total Recoverable	CML-SD-21-00	10163437024	292	mg/kg	J	The MS and/or MSD recovery(ies) were above the acceptable limits indicating possible matrix interference.
Barium, Total Recoverable	CML-SD-22-00	10163437031	153	mg/kg	J	The MS and/or MSD recovery(ies) were above the acceptable limits indicating possible matrix interference.
Barium, Total Recoverable	CML-SD-23-00	10163437032	190	mg/kg	J	The MS and/or MSD recovery(ies) were above the acceptable limits indicating possible matrix interference.
Barium, Total Recoverable	CML-SD-23-02	10163437033	218	mg/kg	J	The MS and/or MSD recovery(ies) were above the acceptable limits indicating possible matrix interference.
Barium, Total Recoverable	CML-SD-24-01	10163437021	425	mg/kg	J	The MS and/or MSD recovery(ies) were above the acceptable limits indicating possible matrix interference.
Barium, Total Recoverable	CML-SD-25-00	10163437022	515	mg/kg	J	The MS and/or MSD recovery(ies) were above the acceptable limits indicating possible matrix interference.
Barium, Total Recoverable	CML-SD-26-00	10163437023	185	mg/kg	J	The MS and/or MSD recovery(ies) were above the acceptable limits indicating possible matrix interference.
Barium, Total Recoverable	CML-SD-30-00	10163437030	294	mg/kg	J	The MS and/or MSD recovery(ies) were above the acceptable limits indicating possible matrix interference.
Barium, Total Recoverable	CML-SD-39-00	10163437029	414	mg/kg	J	The MS and/or MSD recovery(ies) were above the acceptable limits indicating possible matrix interference.
Barium, Total Recoverable	CML-SD-42-00	10163437027	63.2	mg/kg	J	The MS and/or MSD recovery(ies) were above the acceptable limits indicating possible matrix interference.
Barium, Total Recoverable	CML-SD-42-02	10163437028	171	mg/kg	J	The MS and/or MSD recovery(ies) were above the acceptable limits indicating possible matrix interference.

Analyte	Field Sample ID	Lab Sample ID	Result	Units	Reviewer Qualifier	Reviewer Qualifier Reason
Copper, Total Recoverable	CML-SD-18-00	10163437036	1070	mg/kg	J	The MS and/or MSD recovery(ies) were above the acceptable limits indicating possible matrix interference.
Copper, Total Recoverable	CML-SD-19-00	10163437034	727	mg/kg	J	The MS and/or MSD recovery(ies) were above the acceptable limits indicating possible matrix interference.
Copper, Total Recoverable	CML-SD-19-02	10163437035	361	mg/kg	J	The MS and/or MSD recovery(ies) were above the acceptable limits indicating possible matrix interference.
Copper, Total Recoverable	CML-SD-20-00	10163437025	2430	mg/kg	J	The MS and/or MSD recovery(ies) were above the acceptable limits indicating possible matrix interference.
Copper, Total Recoverable	CML-SD-20-02	10163437026	136	mg/kg	J	The MS and/or MSD recovery(ies) were above the acceptable limits indicating possible matrix interference.
Copper, Total Recoverable	CML-SD-21-00	10163437024	1630	mg/kg	J	The MS and/or MSD recovery(ies) were above the acceptable limits indicating possible matrix interference.
Copper, Total Recoverable	CML-SD-22-00	10163437031	154	mg/kg	J	The MS and/or MSD recovery(ies) were above the acceptable limits indicating possible matrix interference.
Copper, Total Recoverable	CML-SD-23-00	10163437032	249	mg/kg	J	The MS and/or MSD recovery(ies) were above the acceptable limits indicating possible matrix interference.
Copper, Total Recoverable	CML-SD-23-02	10163437033	661	mg/kg	J	The MS and/or MSD recovery(ies) were above the acceptable limits indicating possible matrix interference.
Copper, Total Recoverable	CML-SD-24-01	10163437021	1390	mg/kg	J	The MS and/or MSD recovery(ies) were above the acceptable limits indicating possible matrix interference.
Copper, Total Recoverable	CML-SD-25-00	10163437022	837	mg/kg	J	The MS and/or MSD recovery(ies) were above the acceptable limits indicating possible matrix interference.

Analyte	Field Sample ID	Lab Sample ID	Result	Units	Reviewer Qualifier	Reviewer Qualifier Reason
Copper, Total Recoverable	CML-SD-26-00	10163437023	654	mg/kg	J	The MS and/or MSD recovery(ies) were above the acceptable limits indicating possible matrix interference.
Copper, Total Recoverable	CML-SD-30-00	10163437030	1550	mg/kg	J	The MS and/or MSD recovery(ies) were above the acceptable limits indicating possible matrix interference.
Copper, Total Recoverable	CML-SD-39-00	10163437029	180	mg/kg	J	The MS and/or MSD recovery(ies) were above the acceptable limits indicating possible matrix interference.
Copper, Total Recoverable	CML-SD-42-00	10163437027	123	mg/kg	J	The MS and/or MSD recovery(ies) were above the acceptable limits indicating possible matrix interference.
Copper, Total Recoverable	CML-SD-42-02	10163437028	309	mg/kg	J	The MS and/or MSD recovery(ies) were above the acceptable limits indicating possible matrix interference.
Lead, Total Recoverable	CML-SD-18-00	10163437036	663	mg/kg	J	The MS and/or MSD recovery(ies) were outside the acceptable limits indicating possible matrix interference.
Lead, Total Recoverable	CML-SD-19-00	10163437034	2560	mg/kg	J	The MS and/or MSD recovery(ies) were outside the acceptable limits indicating possible matrix interference.
Lead, Total Recoverable	CML-SD-19-02	10163437035	197	mg/kg	J	The MS and/or MSD recovery(ies) were outside the acceptable limits indicating possible matrix interference.
Lead, Total Recoverable	CML-SD-20-00	10163437025	3720	mg/kg	J	The MS and/or MSD recovery(ies) were outside the acceptable limits indicating possible matrix interference.
Lead, Total Recoverable	CML-SD-20-02	10163437026	86.1	mg/kg	J	The MS and/or MSD recovery(ies) were outside the acceptable limits indicating possible matrix interference.
Lead, Total Recoverable	CML-SD-21-00	10163437024	2940	mg/kg	J	The MS and/or MSD recovery(ies) were outside the acceptable limits indicating possible matrix interference.

Analyte	Field Sample ID	Lab Sample ID	Result	Units	Reviewer Qualifier	Reviewer Qualifier Reason
Lead, Total Recoverable	CML-SD-22-00	10163437031	186	mg/kg	J	The MS and/or MSD recovery(ies) were outside the acceptable limits indicating possible matrix interference.
Lead, Total Recoverable	CML-SD-23-00	10163437032	282	mg/kg	J	The MS and/or MSD recovery(ies) were outside the acceptable limits indicating possible matrix interference.
Lead, Total Recoverable	CML-SD-23-02	10163437033	300	mg/kg	J	The MS and/or MSD recovery(ies) were outside the acceptable limits indicating possible matrix interference.
Lead, Total Recoverable	CML-SD-24-00	10163437020	617	mg/kg	J	The MS and/or MSD recovery(ies) were outside the acceptable limits indicating possible matrix interference.
Lead, Total Recoverable	CML-SD-24-01	10163437021	182	mg/kg	J	The MS and/or MSD recovery(ies) were outside the acceptable limits indicating possible matrix interference.
Lead, Total Recoverable	CML-SD-25-00	10163437022	1210	mg/kg	J	The MS and/or MSD recovery(ies) were outside the acceptable limits indicating possible matrix interference.
Lead, Total Recoverable	CML-SD-26-00	10163437023	1870	mg/kg	J	The MS and/or MSD recovery(ies) were outside the acceptable limits indicating possible matrix interference.
Lead, Total Recoverable	CML-SD-27-00	10163437019	1050	mg/kg	J	The MS and/or MSD recovery(ies) were outside the acceptable limits indicating possible matrix interference.
Lead, Total Recoverable	CML-SD-28-00	10163437018	1440	mg/kg	J	The MS and/or MSD recovery(ies) were outside the acceptable limits indicating possible matrix interference.
Lead, Total Recoverable	CML-SD-29-00	10163437017	3890	mg/kg	J	The MS and/or MSD recovery(ies) were outside the acceptable limits indicating possible matrix interference.
Lead, Total Recoverable	CML-SD-30-00	10163437030	81.8	mg/kg	J	The MS and/or MSD recovery(ies) were outside the acceptable limits indicating possible matrix interference.

Analyte	Field Sample ID	Lab Sample ID	Result	Units	Reviewer Qualifier	Reviewer Qualifier Reason
Lead, Total Recoverable	CML-SD-31-00	10163437015	1350	mg/kg	J	The MS and/or MSD recovery(ies) were outside the acceptable limits indicating possible matrix interference.
Lead, Total Recoverable	CML-SD-31-02	10163437016	2350	mg/kg	J	The MS and/or MSD recovery(ies) were outside the acceptable limits indicating possible matrix interference.
Lead, Total Recoverable	CML-SD-32-00	10163437014	2470	mg/kg	J	The MS and/or MSD recovery(ies) were outside the acceptable limits indicating possible matrix interference.
Lead, Total Recoverable	CML-SD-33-00	10163437012	925	mg/kg	J	The MS and/or MSD recovery(ies) were outside the acceptable limits indicating possible matrix interference.
Lead, Total Recoverable	CML-SD-33-01	10163437013	2940	mg/kg	J	The MS and/or MSD recovery(ies) were outside the acceptable limits indicating possible matrix interference.
Lead, Total Recoverable	CML-SD-34	10163437006	2840	mg/kg	J	The MS and/or MSD recovery(ies) were outside the acceptable limits indicating possible matrix interference.
Lead, Total Recoverable	CML-SD-35	10163437007	2200	mg/kg	J	The MS and/or MSD recovery(ies) were outside the acceptable limits indicating possible matrix interference.
Lead, Total Recoverable	CML-SD-36	10163437005	769	mg/kg	J	The MS and/or MSD recovery(ies) were outside the acceptable limits indicating possible matrix interference.
Lead, Total Recoverable	CML-SD-37	10163437004	693	mg/kg	J	The MS and/or MSD recovery(ies) were outside the acceptable limits indicating possible matrix interference.
Lead, Total Recoverable	CML-SD-38	10163437008	518	mg/kg	J	The MS and/or MSD recovery(ies) were outside the acceptable limits indicating possible matrix interference.
Lead, Total Recoverable	CML-SD-39-00	10163437029	238	mg/kg	J	The MS and/or MSD recovery(ies) were outside the acceptable limits indicating possible matrix interference.

Analyte	Field Sample ID	Lab Sample ID	Result	Units	Reviewer Qualifier	Reviewer Qualifier Reason
Lead, Total Recoverable	CML-SD-40	10163437003	88	mg/kg	J	The MS and/or MSD recovery(ies) were outside the acceptable limits indicating possible matrix interference.
Lead, Total Recoverable	CML-SD-41	10163437009	1570	mg/kg	J	The MS and/or MSD recovery(ies) were outside the acceptable limits indicating possible matrix interference.
Lead, Total Recoverable	CML-SD-42-00	10163437027	174	mg/kg	J	The MS and/or MSD recovery(ies) were outside the acceptable limits indicating possible matrix interference.
Lead, Total Recoverable	CML-SD-42-02	10163437028	240	mg/kg	J	The MS and/or MSD recovery(ies) were outside the acceptable limits indicating possible matrix interference.
Lead, Total Recoverable	CML-SD-43	10163437002	136	mg/kg	J	The MS and/or MSD recovery(ies) were outside the acceptable limits indicating possible matrix interference.
Lead, Total Recoverable	CML-SD-44	10163437010	168	mg/kg	J	The MS and/or MSD recovery(ies) were outside the acceptable limits indicating possible matrix interference.
Lead, Total Recoverable	CML-SD-45	10163437001	37.5	mg/kg	J	The MS and/or MSD recovery(ies) were outside the acceptable limits indicating possible matrix interference.
Lead, Total Recoverable	CML-SD-46	10163437011	55	mg/kg	J	The MS and/or MSD recovery(ies) were outside the acceptable limits indicating possible matrix interference.
Zinc, Total Recoverable	CML-SD-18-00	10163437036	479	mg/kg	J	The MS and/or MSD recovery(ies) were above the acceptable limits indicating possible matrix interference.
Zinc, Total Recoverable	CML-SD-19-00	10163437034	238	mg/kg	J	The MS and/or MSD recovery(ies) were above the acceptable limits indicating possible matrix interference.
Zinc, Total Recoverable	CML-SD-19-02	10163437035	339	mg/kg	J	The MS and/or MSD recovery(ies) were above the acceptable limits indicating possible matrix interference.

Analyte	Field Sample ID	Lab Sample ID	Result	Units	Reviewer Qualifier	Reviewer Qualifier Reason
Zinc, Total Recoverable	CML-SD-20-00	10163437025	335	mg/kg	J	The MS and/or MSD recovery(ies) were above the acceptable limits indicating possible matrix interference.
Zinc, Total Recoverable	CML-SD-20-02	10163437026	231	mg/kg	J	The MS and/or MSD recovery(ies) were above the acceptable limits indicating possible matrix interference.
Zinc, Total Recoverable	CML-SD-21-00	10163437024	413	mg/kg	J	The MS and/or MSD recovery(ies) were above the acceptable limits indicating possible matrix interference.
Zinc, Total Recoverable	CML-SD-22-00	10163437031	118	mg/kg	J	The MS and/or MSD recovery(ies) were above the acceptable limits indicating possible matrix interference.
Zinc, Total Recoverable	CML-SD-23-00	10163437032	92.4	mg/kg	J	The MS and/or MSD recovery(ies) were above the acceptable limits indicating possible matrix interference.
Zinc, Total Recoverable	CML-SD-23-02	10163437033	108	mg/kg	J	The MS and/or MSD recovery(ies) were above the acceptable limits indicating possible matrix interference.
Zinc, Total Recoverable	CML-SD-24-00	10163437020	269	mg/kg	J	The MS and/or MSD recovery(ies) were above the acceptable limits indicating possible matrix interference.
Zinc, Total Recoverable	CML-SD-24-01	10163437021	328	mg/kg	J	The MS and/or MSD recovery(ies) were above the acceptable limits indicating possible matrix interference.
Zinc, Total Recoverable	CML-SD-25-00	10163437022	326	mg/kg	J	The MS and/or MSD recovery(ies) were above the acceptable limits indicating possible matrix interference.
Zinc, Total Recoverable	CML-SD-26-00	10163437023	235	mg/kg	J	The MS and/or MSD recovery(ies) were above the acceptable limits indicating possible matrix interference.
Zinc, Total Recoverable	CML-SD-27-00	10163437019	175	mg/kg	J	The MS and/or MSD recovery(ies) were above the acceptable limits indicating possible matrix interference.

Analyte	Field Sample ID	Lab Sample ID	Result	Units	Reviewer Qualifier	Reviewer Qualifier Reason
Zinc, Total Recoverable	CML-SD-28-00	10163437018	343	mg/kg	J	The MS and/or MSD recovery(ies) were above the acceptable limits indicating possible matrix interference.
Zinc, Total Recoverable	CML-SD-29-00	10163437017	359	mg/kg	J	The MS and/or MSD recovery(ies) were above the acceptable limits indicating possible matrix interference.
Zinc, Total Recoverable	CML-SD-30-00	10163437030	232	mg/kg	J	The MS and/or MSD recovery(ies) were above the acceptable limits indicating possible matrix interference.
Zinc, Total Recoverable	CML-SD-31-00	10163437015	370	mg/kg	J	The MS and/or MSD recovery(ies) were above the acceptable limits indicating possible matrix interference.
Zinc, Total Recoverable	CML-SD-31-02	10163437016	246	mg/kg	J	The MS and/or MSD recovery(ies) were above the acceptable limits indicating possible matrix interference.
Zinc, Total Recoverable	CML-SD-32-00	10163437014	387	mg/kg	J	The MS and/or MSD recovery(ies) were above the acceptable limits indicating possible matrix interference.
Zinc, Total Recoverable	CML-SD-33-00	10163437012	200	mg/kg	J	The MS and/or MSD recovery(ies) were above the acceptable limits indicating possible matrix interference.
Zinc, Total Recoverable	CML-SD-33-01	10163437013	260	mg/kg	J	The MS and/or MSD recovery(ies) were above the acceptable limits indicating possible matrix interference.
Zinc, Total Recoverable	CML-SD-34	10163437006	333	mg/kg	J	The MS and/or MSD recovery(ies) were above the acceptable limits indicating possible matrix interference.
Zinc, Total Recoverable	CML-SD-35	10163437007	344	mg/kg	J	The MS and/or MSD recovery(ies) were above the acceptable limits indicating possible matrix interference.
Zinc, Total Recoverable	CML-SD-36	10163437005	107	mg/kg	J	The MS and/or MSD recovery(ies) were above the acceptable limits indicating possible matrix interference.

Analyte	Field Sample ID	Lab Sample ID	Result	Units	Reviewer Qualifier	Reviewer Qualifier Reason
Zinc, Total Recoverable	CML-SD-37	10163437004	164	mg/kg	J	The MS and/or MSD recovery(ies) were above the acceptable limits indicating possible matrix interference.
Zinc, Total Recoverable	CML-SD-38	10163437008	134	mg/kg	J	The MS and/or MSD recovery(ies) were above the acceptable limits indicating possible matrix interference.
Zinc, Total Recoverable	CML-SD-39-00	10163437029	101	mg/kg	J	The MS and/or MSD recovery(ies) were above the acceptable limits indicating possible matrix interference.
Zinc, Total Recoverable	CML-SD-40	10163437003	127	mg/kg	J	The MS and/or MSD recovery(ies) were above the acceptable limits indicating possible matrix interference.
Zinc, Total Recoverable	CML-SD-41	10163437009	170	mg/kg	J	The MS and/or MSD recovery(ies) were above the acceptable limits indicating possible matrix interference.
Zinc, Total Recoverable	CML-SD-42-00	10163437027	32.6	mg/kg	J	The MS and/or MSD recovery(ies) were above the acceptable limits indicating possible matrix interference.
Zinc, Total Recoverable	CML-SD-42-02	10163437028	71.9	mg/kg	J	The MS and/or MSD recovery(ies) were above the acceptable limits indicating possible matrix interference.
Zinc, Total Recoverable	CML-SD-43	10163437002	211	mg/kg	J	The MS and/or MSD recovery(ies) were above the acceptable limits indicating possible matrix interference.
Zinc, Total Recoverable	CML-SD-44	10163437010	202	mg/kg	J	The MS and/or MSD recovery(ies) were above the acceptable limits indicating possible matrix interference.
Zinc, Total Recoverable	CML-SD-45	10163437001	78.3	mg/kg	J	The MS and/or MSD recovery(ies) were above the acceptable limits indicating possible matrix interference.
Zinc, Total Recoverable	CML-SD-46	10163437011	227	mg/kg	J	The MS and/or MSD recovery(ies) were above the acceptable limits indicating possible matrix interference.

ATTACHMENT A-5

DATA VALIDATION REPORT FOR DATA SETS 10163483, 10163606, AND 10163633

Tier II Data Validation Report Summary

Client: Herrera Environmental Consultants	Laboratory: Pace Analytical Services, Inc. – Billings, MT
Project Name: Black Pine Mine Reclamation Phase	Sample Matrix: Water
Project Number: 776-012-002	Sample Start Date: 07/12/2011
Date Validated: 09/07/2011	Sample End Date: 07/14/2011
Parameters Included: Total Recoverable Metals (Sb, As, Ba, Cd, Co, Cr, Cu, Fe, Pb, Mn, Ni, and Zn) by Environmental Protection Agency (EPA) Method 200.8, Total Recoverable Metals (Sb, As, Ba, Cd, Cr, Cu, Fe, Pb, Mn, Ni, Ag, and Zn) by Method 6020, Mercury by Solid Waste 846 (SW-846) Methods 7470A and 7471A, Acid Base Accounting by Modified Sobek 3.2, and Percent Moisture by USEPA CLP Method	
Laboratory Project ID: 10163483, 10163606, and 10163633	
Data Validator: Justin Hildenbrand, Environmental Chemist	

DATA EVALUATION CRITERIA SUMMARY

A Tier II Data Validation was performed by Trihydro's Chemical Data Evaluation Services Group on the analytical data report package generated by Pace Analytical Services, Inc., in Billings, MT, evaluating samples from Black Pine Mine site, located in Granite, Montana.

Precision, accuracy, method compliance, and completeness of this data package were assessed during this data review. Precision was determined by evaluating the calculated relative percent difference (RPD) values of samples from field duplicate pairs and laboratory duplicate pairs. Laboratory accuracy was established by reviewing the demonstrated percent recoveries of matrix spike (MS) and matrix spike duplicate (MSD) samples, and of laboratory control samples (LCS) to verify that data are not biased. Method compliance was established by reviewing holding times, detection limits, surrogate recoveries, method blanks, and the LCS percent recoveries against method-specific requirements. Completeness was evaluated by determining the overall ratio of the number of samples planned versus the number of samples with valid analyses. Determination of completeness included a review of the chain-of-custody (CoC), laboratory analytical methods, and other necessary documents associated with this analytical data set.

Data were evaluated in general accordance with validation criteria set forth in the United States Environmental Protection Agency (USEPA) Contract Laboratory Program (CLP) National Functional Guidelines for Inorganic Superfund Data Review, document number EPA 540R-10-011, January 2010. Review of duplicates is conducted in accordance with USEPA Region 1 Laboratory Data Validation Functional Guidelines for Evaluation of Organic Analysis, December 1996 or as specified by the method (as applicable).

Tier II Data Validation Report Summary

SAMPLE NUMBERS TABLE

Client Sample ID	Laboratory Sample Number
10163483	
BP-TS-RS-01-04	10163483001
BP-TS-SS-01-06	10163483002
BP-TS-SS-03-03	10163483003
BP-TS-RS-03-02	10163483004
BP-TS-SS-02-02	10163483005
BP-TS-SS-08-01	10163483006
BP-TS-RS-07-04	10163483007
BP-TS-SS-07-01	10163483008
BP-HM-RS-08-02	10163483009
BP-HM-SS-15-00	10163483010
10163606	
BP-HM-SS-03-03	10163606001
BP-HM-RS-03-01	10163606002
BP-HM-SS-04-10	10163606003
BP-HM-RS-04-07	10163606004
BP-QC-WT-T1	10163606005
BP-HM-RS-01-16.5	10163606006
BP-HM-RS-01-08	10163606007
BP-HM-RS-02-01	10163606008
BP-HM-RS-02-03	10163606009
10163633	
BP-HM-RS-07-01	10163633001
BP-HM-RS-06-01	10163633002
BP-HM-RS-05-02	10163633003
BP-HM-RS-05-05	10163633004
BP-HM-SS-07-03	10163633005
BP-HM-RS-06-08	10163633006
BP-CMN-SS-05-08	10163633007
BP-CMN-RS-05-05	10163633008
BP-CMN-SS-05-00	10163633009
BP-CMN-SS-06-06	10163633010
BP-CMN-RS-06-02	10163633011

Tier II Data Validation Report Summary

Client Sample ID	Laboratory Sample Number
BP-CMN-RS-06-00	10163633012

Tier II Data Validation Report Summary

The samples were analyzed for the required analytes. Assessment of CoC completeness is included in Section #3. The laboratory data were reviewed to evaluate compliance with the required methods and the quality of the reported data. A leading check mark (✓) indicates that the referenced validation criteria were deemed acceptable. A preceding crossed circle (⊗) indicates validation criteria for which the data may have been qualified by the data validator. Details are noted in the tables below.

Validation Criteria

- ✓ Data Completeness
- ✓ CoC Documentation
- ✓ Holding Times and Preservation
- ✓ Laboratory Blanks
- ✓ LCSs
- ⊗ MS/MSDs
- ✓ Laboratory Duplicates
- ✓ Equipment Rinsate

OVERALL DATA PACKAGE ASSESSMENT

Based on a data validation review, the data are acceptable as delivered; exceptions (i.e., rejected data) are noted below. Data qualified by the laboratory are discussed in Section #2.

The purpose of validating data and assigning qualifiers is to assist in proper data interpretation. Data which are not qualified meet the site data quality objectives. If values are assigned qualifiers other than an R (rejected, data not usable), the data may be used for site evaluation, with the reasons for qualification being given consideration when interpreting sample concentrations. Data points which are assigned an R qualifier should not be used for site evaluation purposes. Text identified in **bold font** indicates that further action and/or qualification of the data were required. Data were qualified with J data flags by the laboratory if the result was greater than or equal to the method detection limit (MDL) but less than the reporting limit (RL). Laboratory J flags were preserved in the data and included in the Data Qualification Summary table at the end of this report. Additional data validation qualifiers were added for the items noted with crossed circles, above. Please see the Data Qualification Summary table at the end of this report for a complete list of samples and analytes qualified.

Data qualifiers used during this validation included:

J – Estimated concentration

UJ – Estimated reporting limit

Data Completeness

The analyses were performed as requested on the CoC records. The associated samples were received by the laboratory and analyzed properly. Sample volume for the Modified Sobek 3.2 analysis was provided for BP-HM-SS-15-00 but was not noted on the CoC. The laboratory analyzed the included sample volume. No data were rejected for samples included in these laboratory reports. The completeness of the data validated was measured to be 100%

VALIDATION CRITERIA CHECKLIST	
1. Was the report free of non-conformances related to the analytical data identified by the laboratory?	No
Comments: The laboratory noted the following non-conformances related to the analytical data. 6020 Data Sets 10163483, 10163606, and 10163633: Several MS/MSD recoveries were not evaluated against the control limits due to sample dilution. Data Set 10163606: Lead was detected in one method blank. All associated samples had concentrations of at least ten times greater than the blank or were below the reporting limit. The results for manganese in one MS/MSD sample pair exceeded the calibration range. The reported results are estimates. 7470A Data Set 10163606: One MS recovery for mercury was outside laboratory quality control (QC) limits. The batch was accepted based on LCS recovery results. 7471A Data Sets 10163483, 10163606, and 10163633: Several MSs were not evaluated against the control limits due to sample dilution. In addition, MS/MSD recoveries were outside laboratory QC limits in several MS/MSDs, and the batches were accepted based on LCS recovery results. 200.8 Data Set 10163606: Several matrix spike recoveries exceeded QC limits. The batch was accepted based on LCS recovery. Also, the result found for zinc exceeded the calibration range in one MS. The reported result is estimated.	
2. Were data qualification flags or other notes used by the laboratory? If yes, define.	Yes
Comments: The following data qualifiers were applied to the sample data by the laboratory. D6 – The RPD between the sample and sample duplicate exceeded laboratory control limits. E – Analyte concentration exceeded the calibration range. The reported result is estimated. M1 – Matrix spike recovery exceeded QC limits. Batch accepted based on LCS recovery. M6 – Matrix spike and Matrix spike duplicate recovery not evaluated against control limits due to sample dilution. P8 – Analyte was detected in the method blank. All associated samples had concentrations of at least 10 times greater than the blank or were below the reporting limit.	
3. Were sample CoC forms complete?	Yes
Comments: The CoC records from field to laboratory were complete, and custody was maintained as evidenced by field and laboratory personnel signatures, dates, and times of receipt.	
4. Were detection limits in accordance with the quality assurance project plan (QAPP), permit, or method, or indicated as acceptable?	Yes
Comments: Dilutions were applied for several analyses in this sample set. 6020: The samples required dilutions of 20 to 500 times for the metals analyses in some samples. 7471: The samples required dilutions of 10 times for the mercury analyses in some samples. The dilutions were reviewed and were determined to be acceptable for evaluation of laboratory data quality.	

VALIDATION CRITERIA CHECKLIST	
5. Were the requested analytical methods in compliance with the QAPP, permit, or CoC?	Yes
Comments: The analytical methods were in accordance with project requirements, with the following exception. Analysis by modified Sobek 3.2 was not requested for sample BP-HM-SS-15-00; however, sample volume intended for this analysis was received for the sample. The laboratory performed the modified Sobek 3.2 analysis on this sample. A Chain-of-Custody Confirmation document confirming the sample custody is included in Attachment A at the end of this data validation review.	
6. Were samples received in good condition within method specified requirements?	Yes
Comments: Samples were received on ice, in good condition, with the cooler temperature within the recommended temperature range of 4°C +/- 2°C at 3.1°C to 5.3°C as noted on the Sample Condition Upon Receipt form. The sample containers were reported to be intact.	
7. Were samples analyzed within method specified or technical holding times?	Yes
Comments: Samples were extracted and analyzed within method specified holding times.	
8. Were reported units appropriate for the sample matrix/matrices and method(s) of analyses?	Yes
Comments: Metals data were reported in units of mg/kg in dry weight for soil analyses. Moisture data were reported in units of percent. Data for the modified Sobek method were reported in units of tons/1000, standard units for pH, and weight percent (%w/w). The aqueous rinsate data were reported in units of µg/L. These units are appropriate for the respective methods and matrices.	
9. Do the laboratory reports include all constituents requested to be reported?	Yes
Comments: Reported constituents were in accordance with the CoC.	
10. Was there indication from the laboratory that the initial or continuing calibration verification results were within acceptable limits?	Yes
Comments: Calibration results were not reported with samples of this data set. However, it is assumed that calibration results were acceptable since the laboratory did not report non-conformances.	
11. Was the total number of laboratory blank samples prepared equal to at least 5% of the total number of samples, or analyzed as required by the method?	Yes
Comments: Laboratory blanks were reported on a greater than 5% basis for all methods, with the exceptions of percent moisture and the SMP buffer pH for the modified Sobek method. Method blanks were not reported nor were required for the moisture and SMP buffer pH analyses.	

VALIDATION CRITERIA CHECKLIST

12. Were laboratory blank samples free of analyte contamination? No

Comments: The method blank samples were reported to be free of analyte contamination with the following exception.

For the analysis of metals by Method 6020 in data set 10163606, lead was detected at 0.34 mg/Kg in batch MPRP/27163. Lead in the associated samples was detected at greater than 10 times the amount in the method blank and therefore no further action was required.

13. Was the total number of matrix spike samples prepared equal to at least 5% of the total number of samples, or analyzed as required by the method? Yes

Comments: The total number of MS/MSD samples was equal to at least 5% of the total number of samples for each analysis and batch, with the exception of analyses for percent moisture and for the analyses of neutralization potential, total sulfur, and SMP Buffer pH by Modified Sobek 3.2 which do not require MS/MSDs. The project samples used to prepare the MS and MSD samples are summarized in the table below.

Analysis	Batch	Parent Sample	Parent Data Set
EPA 6020	MPRP/27167	BP-TS-RS-07-04 BP-CMN-SS-08-00	10163483 10163634
EPA 7471	MERP/5632	BP-RY-SS-02-00 BP-HM-SS-15-00	10163246 10163483
EPA 6020	MPRP/27163	BP-RY-SS-02-00 BP-HM-SS-03-03	10163246 10163606
EPA 7471	MERP/5648	BP-HM-SS-03-03 HM-SS-16	10163606 10163635
EPA 7471	MERP/5706	BP-HM-RS-01-16.5	10163606
EPA 6020	MPRP/27166	BP-HM-RS-07-01 BP-CMN-RS-06-02	10163633
EPA 7471	MERP/5649	BP-HM-RS-07-01 BP-CMN-SS-08-03	10163633 10163634

The MS/MSDs for Method 200.8 batch MPRP/27157 and Method 7470 batch MERP/5645 were prepared from samples not associated with this sample event.

VALIDATION CRITERIA CHECKLIST

14. Were MS/MSD percent recoveries and MS/MSD RPDs within data validation or laboratory QC limits? No

Comments: The MS/MSD percent recoveries and RPD data for project samples were within laboratory or data validation QC limits, were not evaluated due to sample dilution, or were not evaluated since the amount spiked was less than four times the amount of analyte measured to be in the original sample, with the following exceptions. Samples that were outside of laboratory limits but within data validation limits were determined to be acceptable.

Analysis	Data Set	Batch	Analyte	MS Recovery	MSD Recovery	MS/MSD Limits	RPD	RPD Limit
7471	**10163483**	**MERP/5632**	**Mercury**	**31%**	**38%**	**75-125%**	**Acceptable**	**20%**
7471	**10163606**	**MERP/5648**	**Mercury**	**-16%**	**Acceptable**	**75-125%**	**50%**	**20%**
7471	**10163633**	**MERP/5649**	**Mercury**	**3%**	**--**	**75-125%**	**--**	**--**
6020	**10163483 10163633**	**MPRP/27166**	**Cobalt**	**226%**	**222%**	**75-125%**	**Acceptable**	**20%**
6020	**10163483 10163633**	**MPRP/27166**	**Cobalt**	**240%**	**--**	**75-125%**	**--**	**--**
6020	**10163483**	**MPRP/27167**	**Cobalt**	**254%**	**246%**	**75-125%**	**Acceptable**	**20%**
6020	**10163483**	**MPRP/27167**	**Cobalt**	**326%**	**--**	**75-125%**	**--**	**--**

Mercury data for samples associated with batch MERP/5632 were detections and were qualified as J due to possible low bias. Mercury data for batch MERP/5648 were qualified as J or as UJ due to possible low bias and due to evidence of poor precision in batch MERP/5648. Mercury data for batch MERP/5649 was qualified as J or as UJ due to possible low bias, and mercury for the parent sample BP-CMN-SS-08-03 in data set 10163634 was rejected and assigned an R data qualifier due to the extremely low recovery in the MS.

Cobalt detections for samples associated with batches MPRP/27166 and MPRP/27167 were qualified as J for detections due to possible high bias. Non-detections did not require qualification since the high recoveries indicate a possible high bias.

15. Was the total number of LCSs analyzed equal to at least 5% of the total number of samples, or analyzed as required by the method? Yes

Comments: The total number of LCSs was equal to at least 5% of the total number of samples, with the exceptions of analyses for percent moisture and for the Modified Sobek 3.2 analyses for which LCS samples were not required.

16. Were LCS/LCSD percent recoveries and LCS/LCSD RPDs within data validation or laboratory QC limits? Yes

Comments: The LCS percent recoveries were within laboratory QC limits.

17. Were surrogate recoveries within laboratory QC limits? N/A

Comments: Surrogates are not required for the reported methods.

18. Was the number of equipment, trip, or field blanks collected compliant with the project guidelines, quality assurance project plan (QAPP), sample analysis plan (SAP), or permit? No

Comments: Equipment, trip, and field blanks were not collected with the samples of this data set. One rinsate blank (BP-QC-WT-T1) was collected for this sampling period in data set 10163606 to evaluate possible equipment sources of contamination.

VALIDATION CRITERIA CHECKLIST

19. Were the trip blank, field blank, and/or equipment blank samples free of analyte contamination? No

Comments Detections were not reported in the rinsate blank, with the following exception.

Total recoverable lead was detected at 0.47 µg/L in the rinsate blank. Qualification was not required since total recoverable lead was detected in the samples at both greater than the reporting limit and greater than ten times the amount in the rinsate blank.

20. Was the number of field duplicates collected compliant with the project guidelines, QAPP, SAP, or permit? No

Comments: Field duplicates were not submitted with these sample sets.

21. Were field duplicate RPD values within data validation QC limits (soil 0-35%)? N/A

Comments: Field duplicates were not submitted with these sample sets.

22. Were laboratory duplicate RPD values within laboratory QC limits? Yes

Comments: Laboratory duplicates were not prepared for Methods 6020, 7470, or 7471A. Laboratory duplicates were prepared for the remaining sample analyses. The project samples used for the laboratory duplicate sample analyses are summarized in the table below.

Data Set	Analysis	Batch	Parent Sample	Data Set
10163606	% Moisture	MPRP/27256	BP-HM-SS-04-10	10163606
10163606	% Moisture	MPRP/27258	BP-HM-RS-04-07 HM-SS-16	10163606 10163635
10163633	% Moisture	MPRP/27268	BP-CMN-SS-05-08	10163633
10163633	% Moisture	MPRP/27274	BP-CMN-RS-05-05	10163633
10163606	Modified Sobek 3.2	MT/6452	BP-HM-RS-03-01 BP-RY-SS-04-02	10163606 10163246
10163606	Modified Sobek 3.2	MT/6480	BP-HM-RS-03-01 BP-RY-SS-04-02	10163606 10163246
10163606	Modified Sobek 3.2	MT/6481	BP-HM-RS-03-01 BP-RY-SS-04-02	10163606 10163246
10163483	Modified Sobek 3.2	MT/6487	BP-CMN-RS-05-05 HM-SS-10	10163633 10163635
10163483 10163633	Modified Sobek 3.2	MT/6496	BP-CMN-SS-05-00 HM-SS-10	10163633 10163635
10163483	Modified Sobek 3.2	MT/6542	BP-CMN-RS-05-05 HM-SS-10	10163633 10163635

Additional laboratory duplicates were prepared for several batches from samples not associated with this sample event.

The laboratory duplicate RPD values were within laboratory QC limits, or were not applicable since one or both sample results were either non-detect or were detected at less than five times the laboratory reporting limit.

DATA QUALIFICATION SUMMARY

Analyte	Client Sample ID	Laboratory Assigned ID	Laboratory Result	Reviewer Qualifier	Reason for Qualification
Mercury, Total	BP-TS-RS-01-04	10163483001	2.3 mg/kg	J	The MS and/or MSD recovery(ies) were below the acceptable limits indicating possible matrix interference.
Mercury, Total	BP-TS-SS-01-06	10163483002	0.047 mg/kg	J	The MS and/or MSD recovery(ies) were below the acceptable limits indicating possible matrix interference.
Mercury, Total	BP-TS-SS-03-03	10163483003	0.029 mg/kg	J	The MS and/or MSD recovery(ies) were below the acceptable limits indicating possible matrix interference.
Mercury, Total	BP-TS-RS-03-02	10163483004	2.1 mg/kg	J	The MS and/or MSD recovery(ies) were below the acceptable limits indicating possible matrix interference.
Mercury, Total	BP-TS-SS-02-02	10163483005	1 mg/kg	J	The MS and/or MSD recovery(ies) were below the acceptable limits indicating possible matrix interference.
Mercury, Total	BP-TS-SS-08-01	10163483006	0.15 mg/kg	J	The MS and/or MSD recovery(ies) were below the acceptable limits indicating possible matrix interference.
Mercury, Total	BP-TS-RS-07-04	10163483007	1.1 mg/kg	J	The MS and/or MSD recovery(ies) were below the acceptable limits indicating possible matrix interference.
Mercury, Total	BP-TS-SS-07-01	10163483008	0.69 mg/kg	J	The MS and/or MSD recovery(ies) were below the acceptable limits indicating possible matrix interference.
Mercury, Total	BP-HM-RS-08-02	10163483009	0.57 mg/kg	J	The MS and/or MSD recovery(ies) were below the acceptable limits indicating possible matrix interference.
Mercury, Total	BP-HM-SS-15-00	10163483010	3.6 mg/kg	J	The MS and/or MSD recovery(ies) were below the acceptable limits indicating possible matrix interference.
Mercury, Total	BP-HM-SS-03-03	10163606001	0.86 mg/kg	J	The MS and/or MSD recovery(ies) were below the acceptable limits indicating possible matrix interference.
Mercury, Total	BP-HM-RS-03-01	10163606002	1.2 mg/kg	J	The MS and/or MSD recovery(ies) were below the acceptable limits indicating possible matrix interference.
Mercury, Total	BP-HM-SS-04-10	10163606003	0.04 mg/kg	J	The MS and/or MSD recovery(ies) were below the acceptable limits indicating possible matrix interference.
Mercury, Total	BP-HM-RS-04-07	10163606004	0.34 mg/kg	J	The MS and/or MSD recovery(ies) were below the acceptable limits indicating possible matrix interference.

Analyte	Client Sample ID	Laboratory Assigned ID	Laboratory Result	Reviewer Qualifier	Reason for Qualification
Mercury, Total	BP-HM-RS-01-08	10163606007	0.077 mg/kg	J	The MS and/or MSD recovery(ies) were below the acceptable limits indicating possible matrix interference.
Mercury, Total	BP-HM-RS-02-01	10163606008	ND(0.021 mg/kg)	UJ	The MS and/or MSD recovery(ies) were below the acceptable limits indicating possible matrix interference.
Mercury, Total	BP-HM-RS-02-03	10163606009	3.5 mg/kg	J	The MS and/or MSD recovery(ies) were below the acceptable limits indicating possible matrix interference.
Mercury, Total	BP-HM-RS-07-01	10163633001	7 mg/kg	J	The MS and/or MSD recovery(ies) were below the acceptable limits indicating possible matrix interference.
Mercury, Total	BP-HM-RS-06-01	10163633002	0.56 mg/kg	J	The MS and/or MSD recovery(ies) were below the acceptable limits indicating possible matrix interference.
Mercury, Total	BP-HM-RS-05-02	10163633003	0.094 mg/kg	J	The MS and/or MSD recovery(ies) were below the acceptable limits indicating possible matrix interference.
Mercury, Total	BP-HM-RS-05-05	10163633004	0.059 mg/kg	J	The MS and/or MSD recovery(ies) were below the acceptable limits indicating possible matrix interference.
Mercury, Total	BP-HM-SS-07-03	10163633005	8.5 mg/kg	J	The MS and/or MSD recovery(ies) were below the acceptable limits indicating possible matrix interference.
Mercury, Total	BP-HM-RS-06-08	10163633006	0.04 mg/kg	J	The MS and/or MSD recovery(ies) were below the acceptable limits indicating possible matrix interference.
Mercury, Total	BP-CMN-SS-05-08	10163633007	ND(0.022 mg/kg)	UJ	The MS and/or MSD recovery(ies) were below the acceptable limits indicating possible matrix interference.
Mercury, Total	BP-CMN-RS-05-05	10163633008	0.27 mg/kg	J	The MS and/or MSD recovery(ies) were below the acceptable limits indicating possible matrix interference.
Mercury, Total	BP-CMN-SS-05-00	10163633009	ND(0.021 mg/kg)	UJ	The MS and/or MSD recovery(ies) were below the acceptable limits indicating possible matrix interference.
Mercury, Total	BP-CMN-SS-06-06	10163633010	ND(0.02 mg/kg)	UJ	The MS and/or MSD recovery(ies) were below the acceptable limits indicating possible matrix interference.
Mercury, Total	BP-CMN-RS-06-02	10163633011	0.26 mg/kg	J	The MS and/or MSD recovery(ies) were below the acceptable limits indicating possible matrix interference.
Mercury, Total	BP-CMN-RS-06-00	10163633012	ND(0.022 mg/kg)	UJ	The MS and/or MSD recovery(ies) were below the acceptable limits indicating possible matrix interference.

Analyte	Client Sample ID	Laboratory Assigned ID	Laboratory Result	Reviewer Qualifier	Reason for Qualification
Cobalt, Total Recoverable	BP-TS-RS-01-04	10163483001	0.94 mg/kg	J	The MS and/or MSD recovery(ies) were above the acceptable limits indicating possible matrix interference.
Cobalt, Total Recoverable	BP-TS-SS-01-06	10163483002	3.1 mg/kg	J	The MS and/or MSD recovery(ies) were above the acceptable limits indicating possible matrix interference.
Cobalt, Total Recoverable	BP-TS-SS-03-03	10163483003	3.5 mg/kg	J	The MS and/or MSD recovery(ies) were above the acceptable limits indicating possible matrix interference.
Cobalt, Total Recoverable	BP-TS-RS-03-02	10163483004	1.3 mg/kg	J	The MS and/or MSD recovery(ies) were above the acceptable limits indicating possible matrix interference.
Cobalt, Total Recoverable	BP-TS-SS-02-02	10163483005	3 mg/kg	J	The MS and/or MSD recovery(ies) were above the acceptable limits indicating possible matrix interference.
Cobalt, Total Recoverable	BP-TS-SS-08-01	10163483006	9.3 mg/kg	J	The MS and/or MSD recovery(ies) were above the acceptable limits indicating possible matrix interference.
Cobalt, Total Recoverable	BP-TS-RS-07-04	10163483007	2.5 mg/kg	J	The MS and/or MSD recovery(ies) were above the acceptable limits indicating possible matrix interference.
Cobalt, Total Recoverable	BP-TS-SS-07-01	10163483008	3.6 mg/kg	J	The MS and/or MSD recovery(ies) were above the acceptable limits indicating possible matrix interference.
Cobalt, Total Recoverable	BP-HM-RS-08-02	10163483009	8.5 mg/kg	J	The MS and/or MSD recovery(ies) were above the acceptable limits indicating possible matrix interference.
Cobalt, Total Recoverable	BP-HM-SS-15-00	10163483010	0.63 mg/kg	J	The MS and/or MSD recovery(ies) were above the acceptable limits indicating possible matrix interference.
Cobalt, Total Recoverable	BP-HM-RS-07-01	10163633001	1.1 mg/kg	J	The MS and/or MSD recovery(ies) were above the acceptable limits indicating possible matrix interference.
Cobalt, Total Recoverable	BP-HM-RS-06-01	10163633002	2.8 mg/kg	J	The MS and/or MSD recovery(ies) were above the acceptable limits indicating possible matrix interference.
Cobalt, Total Recoverable	BP-HM-RS-05-02	10163633003	9.9 mg/kg	J	The MS and/or MSD recovery(ies) were above the acceptable limits indicating possible matrix interference.
Cobalt, Total Recoverable	BP-HM-RS-05-05	10163633004	5.3 mg/kg	J	The MS and/or MSD recovery(ies) were above the acceptable limits indicating possible matrix interference.
Cobalt, Total Recoverable	BP-HM-SS-07-03	10163633005	6.8 mg/kg	J	The MS and/or MSD recovery(ies) were above the acceptable limits indicating possible matrix interference.

Analyte	Client Sample ID	Laboratory Assigned ID	Laboratory Result	Reviewer Qualifier	Reason for Qualification
Cobalt, Total Recoverable	BP-HM-RS-06-08	10163633006	9.8 mg/kg	J	The MS and/or MSD recovery(ies) were above the acceptable limits indicating possible matrix interference.
Cobalt, Total Recoverable	BP-CMN-SS-05-08	10163633007	5.4 mg/kg	J	The MS and/or MSD recovery(ies) were above the acceptable limits indicating possible matrix interference.
Cobalt, Total Recoverable	BP-CMN-RS-05-05	10163633008	4.1 mg/kg	J	The MS and/or MSD recovery(ies) were above the acceptable limits indicating possible matrix interference.
Cobalt, Total Recoverable	BP-CMN-SS-05-00	10163633009	6.1 mg/kg	J	The MS and/or MSD recovery(ies) were above the acceptable limits indicating possible matrix interference.
Cobalt, Total Recoverable	BP-CMN-SS-06-06	10163633010	7 mg/kg	J	The MS and/or MSD recovery(ies) were above the acceptable limits indicating possible matrix interference.
Cobalt, Total Recoverable	BP-CMN-RS-06-02	10163633011	2.5 mg/kg	J	The MS and/or MSD recovery(ies) were above the acceptable limits indicating possible matrix interference.
Cobalt, Total Recoverable	BP-CMN-RS-06-00	10163633012	7.8 mg/kg	J	The MS and/or MSD recovery(ies) were above the acceptable limits indicating possible matrix interference.

ATTACHMENT A

CHAIN-OF-CUSTODY CONFIRMATION

HERRERA

September 22, 2011

Gina Catarra
Herrera Environmental Consultants
101 East Broadway, Suite 610
Missoula, MT 59802

Chain of Custody Confirmation

I, Gina Catarra, representing Herrera Environmental Consultants for the Black Pine Mine site, do confirm the following information inadvertently left off the chain-of-custody (CoC) provided with data set 10163483. In addition, I do confirm that all soil samples were provided to the laboratory in the proper, method-referenced, containers and were properly preserved (chemically and physically). The information identified in bold italics will be used to further clarify the CoC documentation.

For sample BP-HM-SS-15-00, the analysis of modified Sobek 3.2 was inadvertently not requested on the CoC. Sample volume intended for modified Sobek 3.2 was shipped to the laboratory, and the laboratory appropriately performed the modified Sobek 3.2 analysis on this sample.

To the best of my knowledge, the above information is correct.

Gina Catarra — 9/22/11

FIRST NAME LAST NAME — DATE

This confirmation is an amendment to the chain-of-custody accompanying the Black Pine Mine Reclamation Phase, Pace Analytical Services, Inc. – Billings, MT data set 10163483.

ATTACHMENT A-6

DATA VALIDATION REPORT FOR DATA SETS 10163634, 10163635, AND 10163640

Tier II Data Validation Report Summary

Client: Herrera Environmental Consultants	Laboratory: Pace Analytical Services, Inc. – Billings, MT
Project Name: Black Pine Mine Reclamation Phase	Sample Matrix: Water
Project Number: 776-012-002	Sample Start Date: 07/13/2011
Date Validated: 09/09/2011	Sample End Date: 07/15/2011
Parameters Included: Total Recoverable Metals (Sb, As, Ba, Cd, Co, Cr, Cu, Fe, Pb, Mn, Ni, and Zn) by Method 6020, Mercury by Solid Waste 846 (SW-846) Method 7471A, Acid Base Accounting by Modified Sobek 3.2, pH, Saturated Paste by American Society of Agronomy (ASA) 10-3.2, Specific Conductance Saturated Paste by ASA 10-3.3, Available Phosphorous by ASA 24-5.4 and Standard Methods (SM) 4500, Organic Matter by ASA 29-3.5.2, Available Nitrate by ASA 33-3.2 and EPA 353.2, Coarse Fragment by ASTM D421, Potassium by Contract Laboratory Program (CLP) Inductively Coupled Plasma (ICP) Atomic Emission Spectroscopy (AES) Montana Department of Environmental Quality (MDEQ) Methodology, Cation Exchange Capacity by EPA 9081, and Percent Moisture by USEPA CLP Method	
Laboratory Project ID: 10163634, 10163635, and 10163640	
Data Validator: Justin Hildenbrand, Environmental Chemist	

DATA EVALUATION CRITERIA SUMMARY

A Tier II Data Validation was performed by Trihydro's Chemical Data Evaluation Services Group on the analytical data report package generated by Pace Analytical Services, Inc., in Billings, MT, evaluating samples from Black Pine Mine site, located in Granite, Montana.

Precision, accuracy, method compliance, and completeness of this data package were assessed during this data review. Precision was determined by evaluating the calculated relative percent difference (RPD) values of samples from field duplicate pairs and laboratory duplicate pairs. Laboratory accuracy was established by reviewing the demonstrated percent recoveries of matrix spike (MS) and matrix spike duplicate (MSD) samples, and of laboratory control samples (LCS) to verify that data are not biased. Method compliance was established by reviewing holding times, detection limits, surrogate recoveries, method blanks, and the LCS percent recoveries against method-specific requirements. Completeness was evaluated by determining the overall ratio of the number of samples planned versus the number of samples with valid analyses. Determination of completeness included a review of the chain-of-custody (CoC), laboratory analytical methods, and other necessary documents associated with this analytical data set.

Data were evaluated in general accordance with validation criteria set forth in the United States Environmental Protection Agency (USEPA) CLP National Functional Guidelines for Inorganic Superfund Data Review, document number EPA 540R-10-011, January 2010, with additional reference to the USEPA CLP National Functional Guidelines for Inorganic Superfund Data Review, document number EPA 540-R-04-004, October 2004. Review of duplicates is conducted in accordance with USEPA Region 1 Laboratory Data Validation Functional Guidelines for Evaluation of Organic Analysis, December 1996 or as specified by the method (as applicable).

Tier II Data Validation Report Summary

SAMPLE NUMBERS TABLE

Client Sample ID	Laboratory Sample Number
10163634	
BP-CMN-SS-04-00	10163634001
BP-CMN-RS-04-02	10163634002
BP-CMN-RS-04-05	10163634003
BP-CMN-SS-04-08	10163634004
BP-CMN-SS-07-00	10163634005
BP-CMN-SS-07-06	10163634006
BP-CMN-SS-08-00	10163634007
BP-CMN-SS-08-03	10163634008
BP-CMN-SS-09-00	10163634009
BP-CMN-SS-09-04	10163634010
10163635	
CMN-SS-15	10163635001
CMN-SS-16	10163635002
HM-SS-10	10163635003
HM-SS-09	10163635004
HM-SS-12	10163635005
HM-SS-11	10163635006
HM-SS-13	10163635007
HM-SS-14	10163635008
HM-SS-16	10163635009
10163640	
BP-CML-TS-04-00	10163640001
BP-CML-TS-04-02	10163640002
BP-CML-SS-04-06	10163640003
BP-CML-TS-05-00	10163640004
BP-CML-TS-05-02	10163640005
BP-CML-SS-05-04	10163640006
BP-CML-TS-06-00	10163640007
BP-CML-TS-06-02	10163640008
BP-CML-SS-06-05	10163640009

Tier II Data Validation Report Summary

The samples were analyzed for the required analytes. Assessment of CoC completeness is included in Section #3. The laboratory data were reviewed to evaluate compliance with the required methods and the quality of the reported data. A leading check mark (✓) indicates that the referenced validation criteria were deemed acceptable. A preceding crossed circle (⊗) indicates validation criteria for which the data may have been qualified by the data validator. Details are noted in the tables below.

Validation Criteria

- ⊗ Data Completeness
- ✓ CoC Documentation
- ✓ Holding Times and Preservation
- ✓ Laboratory Blanks
- ✓ LCS/LCSDs
- ⊗ MS/MSDs
- ⊗ Laboratory Duplicates
- ✓ Equipment Rinsate

OVERALL DATA PACKAGE ASSESSMENT

Based on a data validation review, the data are acceptable as delivered; exceptions (i.e., rejected data) are noted below. Data qualified by the laboratory are discussed in Section #2.

The purpose of validating data and assigning qualifiers is to assist in proper data interpretation. Data which are not qualified meet the site data quality objectives. If values are assigned qualifiers other than an R (rejected, data not usable), the data may be used for site evaluation, with the reasons for qualification being given consideration when interpreting sample concentrations. Data points which are assigned an R qualifier should not be used for site evaluation purposes. Text identified in **bold font** indicates that further action and/or qualification of the data were required. Data were qualified with J data flags by the laboratory if the result was greater than or equal to the method detection limit (MDL) but less than the reporting limit (RL). Laboratory J flags were preserved in the data and included in the Data Qualification Summary table at the end of this report. Additional data validation qualifiers were added for the items noted with crossed circles, above. Please see the Data Qualification Summary table at the end of this report for a complete list of samples and analytes qualified.

Data qualifiers used during this validation included:

J – Estimated concentration

R – Rejected, Data not usable

Data Completeness

The analyses were performed as requested on the CoC records. The associated samples were received by the laboratory and analyzed properly. One data point was rejected due to a low MS recovery, and one analyte was not reported as there was insufficient sample volume to perform the analysis. The completeness of the data validated was measured to be 99.68%.

VALIDATION CRITERIA CHECKLIST	
1. Was the report free of non-conformances related to the analytical data identified by the laboratory?	No
Comments: The laboratory noted the following non-conformances related to the analytical data. 6020: Data Sets 10163634, 10163635, and 10163640: Several MS/MSD recoveries were not evaluated against the control limits due to sample dilution. Data Set 10163635: Lead was detected in the method blank. All associated samples had concentrations of at least ten times greater than the blank or were below the reporting limit. 7471A: Data Sets 10163634, 10163635, and 10163640: Several MS/MSDs were not evaluated against the control limits due to sample dilution. In addition, MS/MSD recoveries were outside laboratory QC limits in several MS/MSDs, and the batches were accepted based on LCS recovery results. ASA 10-3.3: Data Set 10163634: For the laboratory duplicate analysis, the RPD between the sample and sample duplicate exceeded laboratory control limits.	
2. Were data qualification flags or other notes used by the laboratory? If yes, define.	Yes
Comments: The following data qualifiers were applied to the sample data by the laboratory. D6 – The RPD between the sample and sample duplicate exceeded laboratory control limits. M1 – Matrix spike recovery exceeded QC limits. Batch accepted based on the LCS recovery. M6 – Matrix spike and Matrix spike duplicate recovery not evaluated against control limits due to sample dilution. P8 – Analyte was detected in the method blank. All associated samples had concentrations of at least 10 times greater than the blank or were below the reporting limit.	
3. Were sample CoC forms complete?	Yes
Comments: The CoC records from field to laboratory were complete, and custody was maintained as evidenced by field and laboratory personnel signatures, dates, and times of receipt.	
4. Were detection limits in accordance with the quality assurance project plan (QAPP), permit, or method, or indicated as acceptable?	Yes
Comments: Dilutions were applied for several analyses in this sample set. 6020: The samples required dilutions of 20 to 2000 times for the metals analyses in some samples. 7471A: The samples required dilutions of 25 and 250 times for the mercury analyses in some samples. CLP ICP AES MDEQ: Dilutions of 5 times were applied to the analysis of potassium. 9081: Dilutions of 10 times were applied. The dilutions were reviewed and were determined to be acceptable for evaluation of laboratory data quality.	

VALIDATION CRITERIA CHECKLIST	
5. Were the requested analytical methods in compliance with the QAPP, permit, or CoC?	No
Comments: The analytical methods were in accordance with project requirements, with the following exceptions. Data Set 10163634: Analysis of specific conductance of saturated paste by ASA 10-3.3 was requested for sample BP-CMN-SS-07-00, but was not performed. The laboratory stated in email correspondence that the analysis was not performed due to insufficient sample volume available for analysis. Therefore, this analyte was not reported for the sample. Data Set 10163635: Analyses by modified Sobek 3.2 were requested for samples CMN-SS-15 and CMN-SS-16; however, the laboratory did not receive containers for this analysis and the number of sample containers noted in the CoC was not sufficient to include this analysis. The laboratory noted that the project team was contacted concerning this issue. Data for Sobek 3.2 were not reported for these two samples. A Chain-of-Custody Confirmation document confirming the sample custody is included in Attachment A at the end of this data validation review.	
6. Were samples received in good condition within method specified requirements?	Yes
Comments: Samples were received on ice, in good condition, with the cooler temperature within the recommended temperature range of 4°C +/- 2°C at 3.6°C to 5.8°C as noted on the Sample Condition Upon Receipt forms. The sample containers were reported to be intact.	
7. Were samples analyzed within method specified or technical holding times?	Yes
Comments: Samples were extracted and analyzed within method specified holding times.	
8. Were reported units appropriate for the sample matrix/matrices and method(s) of analyses?	Yes
Comments: Metals data were reported in units of mg/kg in dry weight for soil analyses. Moisture data were reported in units of percent. Data for the modified Sobek method were reported in units of tons/1000, standard units for pH, and weight percent (%w/w). Specific conductance was reported in units of mmhos/cm, and cation exchange capacity was measured in units of meq/100g. These units are appropriate for the respective methods and for the soil matrix.	
9. Do the laboratory reports include all constituents requested to be reported?	Yes
Comments: Reported constituents were in accordance with the CoC, with the exceptions noted in Section 5.	
10. Was there indication from the laboratory that the initial or continuing calibration verification results were within acceptable limits?	Yes
Comments: Calibration results were not reported with samples of this data set. However, it is assumed that calibration results were acceptable since the laboratory did not report non-conformances.	
11. Was the total number of laboratory blank samples prepared equal to at least 5% of the total number of samples, or analyzed as required by the method?	Yes
Comments: Laboratory blanks were reported on a greater than 5% basis for all methods, with the exceptions of percent moisture, the SMP buffer pH for the modified Sobek method, percent moisture, and analysis by ASA_10-3.2. Method blanks were not reported nor were required for these analyses.	
12. Were laboratory blank samples free of analyte contamination?	No
Comments: The method blank samples were reported to be free of analyte contamination with the following exception. For the analysis of metals by Method 6020 in data set 10163635, lead was detected at 0.17 mg/Kg in batch MPRP/27162. Lead in the associated samples was detected at greater than 10 times the amount in the method blank and therefore no further action was required.	

VALIDATION CRITERIA CHECKLIST

13. Was the total number of matrix spike samples prepared equal to at least 5% of the total number of samples, or analyzed as required by the method? Yes

Comments: The total number of MS/MSD samples was equal to at least 5% of the total number of samples for each analysis and batch, with the exceptions of analyses for percent moisture, Modified Sobek 3.2, Method 9081, and the ASA methodologies, which do not require MS/MSDs. The project samples used to prepare the MS and MSD samples are summarized in the table below.

Analysis	Batch	Parent Sample	Parent Data Set
6020	MPRP/27167	BP-TS-RS-07-04	10163483
6020	MPRP/27167	BP-CMN-SS-08-00	10163634
7471	MERP/5649	BP-HM-RS-07-01	10163633
7471	MERP/5649	BP-CMN-SS-08-03	10163634
7471	MERP/5650	BP-CMN-SS-09-00	10163634
7471	MERP/5650	BP-CML-TS-09-04	10163643
6020	MPRP/27162	CMN-SS-15	10163635
7471	MERP/5648	BP-HM-SS-03-03	10163606
7471	MERP/5648	HM-SS-16	10163635
6020	MPRP/27167	BP-TS-RS-07-04	10163483
6020	MPRP/27167	BP-CMN-SS-08-00	10163634
7471	MERP/5650	BP-CMN-SS-09-00	10163634
7471	MERP/5650	BP-CML-TS-09-04	10163643

Two MS/MSDs, for Method 6020 batches MPRP/27162 and MPRP/27235, were prepared from samples not associated with this sample event.

14. Were MS/MSD percent recoveries and MS/MSD RPDs within data validation or laboratory QC limits? No

Comments: The MS/MSD percent recoveries and RPD data for project samples were within laboratory or data validation QC limits, were not evaluated due to sample dilution, or were not evaluated since the amount spiked was less than four times the amount of analyte measured to be in the original sample, with the following exceptions.

Analysis	Data Set	Batch	Analyte	MS Recovery	MSD Recovery	MS/MSD Limits	RPD	RPD Limit
7471A	**10163634 10163640**	**MERP/5650**	**Mercury**	**25%**	**35%**	**75-125%**	**27%**	**20%**
7471A	**10163635**	**MERP/5648**	**Mercury**	**-16%**	**Acceptable**	**75-125%**	**50%**	**20%**
7471A	**10163633 10163635**	**MERP/5649**	**Mercury**	**3%**	**--**	**75-125%**	**--**	**--**
6020	**10163634 10163640**	**MPRP/27167**	**Cobalt**	**254%**	**246%**	**75-125%**	**Acceptable**	**20%**
6020	**10163634 10163640**	**MPRP/27167**	**Cobalt**	**326%**	**--**	**75-125%**	**--**	**--**
6020	**10163640**	**MPRP/27235**	**Cobalt**	**73%**	**Acceptable**	**75-125%**	**29%**	**20%**

Mercury data for associated samples, and cobalt data associated with batch MPRP/27235, were qualified as J for detections and UJ for non-detections due to possible low bias and due to evidence of poor precision.

Mercury data for batch MERP/5649 was qualified as J or as UJ due to possible low bias, and mercury for the parent sample BP-CMN-SS-08-03 was rejected and assigned an R data qualifier due to the extremely low recovery in the MS.

Cobalt detections for samples associated with batch MPRP/27167 were qualified as J for detections due to possible high bias. Non-detections did not require qualification.

VALIDATION CRITERIA CHECKLIST

15. Was the total number of LCSs analyzed equal to at least 5% of the total number of samples, or analyzed as required by the method? — Yes

Comments: The total number of LCSs were equal to at least 5% of the total number of samples, with the exceptions of analyses for percent moisture for the Modified Sobek 3.2 analyses, percent moisture, and for ASA_10-3.2. Analyses of LCSs were neither prepared nor required for these methods.

16. Were LCS/LCSD percent recoveries and LCS/LCSD RPDs within data validation or laboratory QC limits? — No

Comments: The LCS percent recoveries were within laboratory QC limits, with the following exception.

Potassium was outside of the laboratory QC limits of 80-21% at 135% in the LCSD for CLP ICP AES MDEQ batch MPRP/27469 in data set 10163634, indicating a possible high bias. The associated data were non-detect and therefore no qualification was necessary.

17. Were surrogate recoveries within laboratory QC limits? — N/A

Comments: Surrogates are not required for the reported methods.

18. Was the number of equipment, trip, or field blanks collected compliant with the project guidelines, quality assurance project plan (QAPP), sample analysis plan (SAP), or permit? — No

Comments: Equipment, trip, and field blanks were not collected with the samples of this data set. One rinsate blank (BP-QC-WT-T1) was collected for this sampling period in data set 10163606 to evaluate possible equipment sources of contamination.

19. Were the trip blank, field blank, and/or equipment blank samples free of analyte contamination? — No

Comments: Detections were not reported in the rinsate blank, with the following exception.

Total recoverable lead was detected at 0.47 µg/L in the rinsate blank. Qualification was not required since total recoverable lead was detected in the samples at both greater than the reporting limit and greater than ten times the amount in the rinsate blank.

20. Was the number of field duplicates collected compliant with the project guidelines, QAPP, SAP, or permit? — No

Comments: Field duplicates were not submitted with the sample sets.

21. Were field duplicate RPD values within data validation QC limits (soil 0-35%)? — No

Comments: Field duplicates were not submitted with the sample sets.

22. Were laboratory duplicate RPD values within laboratory QC limits? — No

Comments: Laboratory duplicates were not prepared for Methods 6020, CLP ICP AES MDEQ, or 7471A. Laboratory duplicates were prepared for the remaining sample analyses. The project samples used for the laboratory duplicate sample analyses are summarized in the table below.

Data Set	Analysis	Batch	Parent Sample	Data Set
10163634	EPA 9081	ICP/14917	BP-CML-TS-11-01	10163645
10163635	% Moisture	MPRP/27258	BP-HM-RS-04-07 HM-SS-16	10163606 10163635
10163634	% Moisture	MPRP/27290	BP-CMN-SS-07-00	10163634
10163634 10163640	% Moisture	MPRP/27293	BP-CML-TS-09-02 BP-CMN-SS-07-06	10163643

VALIDATION CRITERIA CHECKLIST

Data Set	Analysis	Batch	Parent Sample	Data Set
10163634	CLP ICP AES MDEQ	MPRP/27469	BP-CMN-SS-08-03 BP-CMN-SS-11-04	10163634 10163644
10163634	ASA 10-3.2	MT/6426	BP-CML-TS-11-01 BP-RY-SS-03-14	10163645 10163246
10163634	ASA 29-3.5.2	MT/6438	BP-CMN-SS-08-03 BP-RY-SS-01-00	10163634 10163246
10163634	ASA 33-3.2/EPA 353.2	MT/6442	BP-CMN-SS-12-04 BP-RY-SS-03-14	10163644 10163246
10163634	ASA 24-5.4/SM4500	MT/6443	BP-CMN-SS-13-04 BP-RY-SS-03-14	10163644 10163246
10163634	Modified Sobek 3.2	MT/6452	BP-HM-RS-03-01 BP-RY-SS-04-02	10163606 10163246
10163634	Modified Sobek 3.2	MT/6480	BP-HM-RS-03-01 BP-RY-SS-04-02	10163606 10163246
10163634	Modified Sobek 3.2	MT/6481	BP-HM-RS-03-01 BP-RY-SS-04-02	10163606 10163246
10163635	Modified Sobek 3.2	MT/6487	BP-CMN-RS-05-05 HM-SS-10	10163633 10163635
10163634 10163640	Modified Sobek 3.2	MT/6488	BP-CML-TS-08-05	10163643

Data Set	Analysis	Batch	Parent Sample	Data Set
10163634 10163640	Modified Sobek 3.2	MT/6488	BP-CMN-SS-04-00	10163634
10163635	Modified Sobek 3.2	MT/6496	BP-CMN-SS-05-00 HM-SS-10	10163633 10163635
10163634 10163640	Modified Sobek 3.2	MT/6497	BP-CML-TS-06-02	10163640
10163635	Modified Sobek 3.2	MT/6542	BP-CMN-RS-05-05 HM-SS-10	10163633 10163635
10163634 10163640	Modified Sobek 3.2	MT/6543	BP-CML-TS-08-05 BP-CMN-SS-04-00	10163643 10163634
10163634	ASA 10-3.3	MT/6547	BP-CML-TS-11-01 BP-RY-SS-03-14	10163645 10163246
10163634 10163640	Modified Sobek 3.2	MT/6497	BP-CMN-SS-04-00	10163634

Additionally, laboratory duplicates were prepared for percent moisture batches MPRP/27290 (data set 10163634) and MPRP/27259 (data set 10163640) from samples not associated with this sample event.

The laboratory duplicate RPD values were within laboratory QC limits, or were not applicable since one or both sample results were either non-detect or were detected at less than five times the laboratory reporting limit, with the following exception.

The RPD for the analysis of specific conductance in saturate paste, ASA method 10-3.3, in data set 10163634, was outside of laboratory QC limits of 0-20% at 33%. Associated sample data were qualified as J or as UJ due to possible poor precision.

The RPDs were not calculated by the laboratory for the analysis of neutralization potential by modified Sobek 3.2. The reviewer performed the calculations and found that several RPDs were outside of the limits of 0-20% listed in the project work plan, as listed in the table below.

VALIDATION CRITERIA CHECKLIST			
Data Set	Batch	Parent Sample	RPD
10163634	**MT/6480**	**BP-RY-SS-04-02**	**35.1%**
10163634 10163640	**MT/6497**	**BP-CMN-SS-04-00**	**100.3%**
10163634 10163640	**MT/6497**	**BP-CML-TS-06-02**	**80.0%**

Associated neutralization potential data were qualified as J or as UJ due to evidence of poor precision.

DATA QUALIFICATION SUMMARY

Analyte	Client Sample ID	Laboratory Assigned ID	Laboratory Result	Reviewer Qualifier	Reason for Qualification
Specific Conductance, Saturated Paste	BP-CMN-SS-08-03	10163634008	323 mmhos/cm	J	Laboratory duplicate RPD outside QC limits
Specific Conductance, Saturated Paste	BP-CMN-SS-09-04	10163634010	1 mmhos/cm	J	Laboratory duplicate RPD outside QC limits
Mercury, Total	BP-CMN-RS-04-02	10163634002	0.28 mg/kg	J	The MS and/or MSD recovery(ies) were below the acceptable limits indicating possible matrix interference.
Mercury, Total	BP-CMN-RS-04-05	10163634003	0.13 mg/kg	J	The MS and/or MSD recovery(ies) were below the acceptable limits indicating possible matrix interference.
Mercury, Total	BP-CMN-SS-04-00	10163634001	ND(0.02 mg/kg)	UJ	The MS and/or MSD recovery(ies) were below the acceptable limits indicating possible matrix interference.
Mercury, Total	BP-CMN-SS-04-08	10163634004	ND(0.023 mg/kg)	UJ	The MS and/or MSD recovery(ies) were below the acceptable limits indicating possible matrix interference.
Mercury, Total	BP-CMN-SS-07-00	10163634005	ND(0.021 mg/kg)	UJ	The MS and/or MSD recovery(ies) were below the acceptable limits indicating possible matrix interference.
Mercury, Total	BP-CMN-SS-07-06	10163634006	ND(0.02 mg/kg)	UJ	The MS and/or MSD recovery(ies) were below the acceptable limits indicating possible matrix interference.
Mercury, Total	BP-CMN-SS-08-00	10163634007	ND(0.022 mg/kg)	UJ	The MS and/or MSD recovery(ies) were below the acceptable limits indicating possible matrix interference.
Mercury, Total	BP-CMN-SS-08-03	10163634008	ND(0.021 mg/kg)	R	The MS and/or MSD recovery(ies) were below the acceptable limits indicating possible matrix interference.
Mercury, Total	BP-CMN-SS-09-00	10163634009	0.12 mg/kg	J	The MS and/or MSD recovery(ies) were below the acceptable limits indicating possible matrix interference.
Mercury, Total	BP-CMN-SS-09-04	10163634010	61.3 mg/kg	J	The MS and/or MSD recovery(ies) were below the acceptable limits indicating possible matrix interference.

Analyte	Client Sample ID	Laboratory Assigned ID	Laboratory Result	Reviewer Qualifier	Reason for Qualification
Mercury, Total	BP-CMN-SS-09-00	10163634009	0.12 mg/kg	J	The MS and/or MSD recovery(ies) were below the acceptable limits indicating possible matrix interference.
Mercury, Total	BP-CMN-SS-09-04	10163634010	61.3 mg/kg	J	The MS and/or MSD recovery(ies) were below the acceptable limits indicating possible matrix interference.
Mercury, Total	CMN-SS-15	10163635001	0.093 mg/kg	J	The MS and/or MSD recovery(ies) were below the acceptable limits indicating possible matrix interference.
Mercury, Total	CMN-SS-16	10163635002	0.25 mg/kg	J	The MS and/or MSD recovery(ies) were below the acceptable limits indicating possible matrix interference.
Mercury, Total	HM-SS-10	10163635003	0.029 mg/kg	J	The MS and/or MSD recovery(ies) were below the acceptable limits indicating possible matrix interference.
Mercury, Total	HM-SS-09	10163635004	0.57 mg/kg	J	The MS and/or MSD recovery(ies) were below the acceptable limits indicating possible matrix interference.
Mercury, Total	HM-SS-12	10163635005	0.024 mg/kg	J	The MS and/or MSD recovery(ies) were below the acceptable limits indicating possible matrix interference.
Mercury, Total	HM-SS-11	10163635006	0.89 mg/kg	J	The MS and/or MSD recovery(ies) were below the acceptable limits indicating possible matrix interference.
Mercury, Total	HM-SS-13	10163635007	1 mg/kg	J	The MS and/or MSD recovery(ies) were below the acceptable limits indicating possible matrix interference.
Mercury, Total	HM-SS-14	10163635008	0.26 mg/kg	J	The MS and/or MSD recovery(ies) were below the acceptable limits indicating possible matrix interference.
Mercury, Total	HM-SS-16	10163635009	13 mg/kg	J	The MS and/or MSD recovery(ies) were below the acceptable limits indicating possible matrix interference.
Mercury, Total	BP-CML-TS-04-00	10163640001	0.24 mg/kg	J	The MS and/or MSD recovery(ies) were below the acceptable limits indicating possible matrix interference.

Analyte	Client Sample ID	Laboratory Assigned ID	Laboratory Result	Reviewer Qualifier	Reason for Qualification
Mercury, Total	BP-CML-TS-04-02	10163640002	13.1 mg/kg	J	The MS and/or MSD recovery(ies) were below the acceptable limits indicating possible matrix interference.
Mercury, Total	BP-CML-SS-04-06	10163640003	81.1 mg/kg	J	The MS and/or MSD recovery(ies) were below the acceptable limits indicating possible matrix interference.
Mercury, Total	BP-CML-TS-05-00	10163640004	0.8 mg/kg	J	The MS and/or MSD recovery(ies) were below the acceptable limits indicating possible matrix interference.
Mercury, Total	BP-CML-TS-05-02	10163640005	2.5 mg/kg	J	The MS and/or MSD recovery(ies) were below the acceptable limits indicating possible matrix interference.
Mercury, Total	BP-CML-SS-05-04	10163640006	24.7 mg/kg	J	The MS and/or MSD recovery(ies) were below the acceptable limits indicating possible matrix interference.
Mercury, Total	BP-CML-TS-06-00	10163640007	0.4 mg/kg	J	The MS and/or MSD recovery(ies) were below the acceptable limits indicating possible matrix interference.
Mercury, Total	BP-CML-TS-06-02	10163640008	46.1 mg/kg	J	The MS and/or MSD recovery(ies) were below the acceptable limits indicating possible matrix interference.
Mercury, Total	BP-CML-SS-06-05	10163640009	79.3 mg/kg	J	The MS and/or MSD recovery(ies) were below the acceptable limits indicating possible matrix interference.
Neutralization Potential	BP-CMN-SS-04-00	10163634001	0.73 mg/kg	J	Laboratory duplicate RPD outside QC limits
Neutralization Potential	BP-CMN-RS-04-02	10163634002	ND(0.50 mg/kg)	UJ	Laboratory duplicate RPD outside QC limits
Neutralization Potential	BP-CMN-RS-04-05	10163634003	ND(0.50 mg/kg)	UJ	Laboratory duplicate RPD outside QC limits
Neutralization Potential	BP-CMN-SS-07-00	10163634005	1.2 mg/kg	J	Laboratory duplicate RPD outside QC limits
Neutralization Potential	BP-CMN-SS-07-06	10163634006	2 mg/kg	J	Laboratory duplicate RPD outside QC limits
Neutralization Potential	BP-CMN-SS-08-00	10163634007	1.7 mg/kg	J	Laboratory duplicate RPD outside QC limits
Neutralization Potential	BP-CMN-SS-08-03	10163634008	1.7 mg/kg	J	Laboratory duplicate RPD outside QC limits
Neutralization Potential	BP-CMN-SS-09-00	10163634009	1.2 mg/kg	J	Laboratory duplicate RPD outside QC limits
Neutralization Potential	BP-CMN-SS-09-04	10163634010	3.7 mg/kg	J	Laboratory duplicate RPD outside QC limits

Analyte	Client Sample ID	Laboratory Assigned ID	Laboratory Result	Reviewer Qualifier	Reason for Qualification
Neutralization Potential	BP-CML-TS-04-02	10163640002	1.2 mg/kg	J	Laboratory duplicate RPD outside QC limits
Neutralization Potential	BP-CML-TS-05-02	10163640005	ND(0.50 mg/kg)	UJ	Laboratory duplicate RPD outside QC limits
Neutralization Potential	BP-CML-TS-06-02	10163640008	2.4 mg/kg	J	Laboratory duplicate RPD outside QC limits
Cobalt, Total Recoverable	BP-CML-SS-04-06	10163640003	11.4 mg/kg	J	The MS and/or MSD recovery(ies) were above the acceptable limits indicating possible matrix interference.
Cobalt, Total Recoverable	BP-CML-SS-05-04	10163640006	1.3 mg/kg	J	The MS and/or MSD recovery(ies) were below the acceptable limits indicating possible matrix interference.
Cobalt, Total Recoverable	BP-CML-SS-06-05	10163640009	4.4 mg/kg	J	The MS and/or MSD recovery(ies) were below the acceptable limits indicating possible matrix interference.
Cobalt, Total Recoverable	BP-CML-TS-04-00	10163640001	2.2 mg/kg	J	The MS and/or MSD recovery(ies) were above the acceptable limits indicating possible matrix interference.
Cobalt, Total Recoverable	BP-CML-TS-04-02	10163640002	8.4 mg/kg	J	The MS and/or MSD recovery(ies) were above the acceptable limits indicating possible matrix interference.
Cobalt, Total Recoverable	BP-CML-TS-05-00	10163640004	7.8 mg/kg	J	The MS and/or MSD recovery(ies) were above the acceptable limits indicating possible matrix interference.
Cobalt, Total Recoverable	BP-CML-TS-05-02	10163640005	1.1 mg/kg	J	The MS and/or MSD recovery(ies) were below the acceptable limits indicating possible matrix interference.
Cobalt, Total Recoverable	BP-CML-TS-06-00	10163640007	2 mg/kg	J	The MS and/or MSD recovery(ies) were below the acceptable limits indicating possible matrix interference.
Cobalt, Total Recoverable	BP-CML-TS-06-02	10163640008	1.3 mg/kg	J	The MS and/or MSD recovery(ies) were below the acceptable limits indicating possible matrix interference.
Cobalt, Total Recoverable	BP-CMN-SS-04-00	10163634001	3.7 mg/kg	J	The MS and/or MSD recovery(ies) were above the acceptable limits indicating possible matrix interference.
Cobalt, Total Recoverable	BP-CMN-SS-04-08	10163634004	1.4 mg/kg	J	The MS and/or MSD recovery(ies) were above the acceptable limits indicating possible matrix interference.

Analyte	Client Sample ID	Laboratory Assigned ID	Laboratory Result	Reviewer Qualifier	Reason for Qualification
Cobalt, Total Recoverable	BP-CMN-SS-07-00	10163634005	6.6 mg/kg	J	The MS and/or MSD recovery(ies) were above the acceptable limits indicating possible matrix interference.
Cobalt, Total Recoverable	BP-CMN-SS-07-06	10163634006	10.3 mg/kg	J	The MS and/or MSD recovery(ies) were above the acceptable limits indicating possible matrix interference.
Cobalt, Total Recoverable	BP-CMN-SS-08-00	10163634007	8.2 mg/kg	J	The MS and/or MSD recovery(ies) were above the acceptable limits indicating possible matrix interference.
Cobalt, Total Recoverable	BP-CMN-SS-08-03	10163634008	5.2 mg/kg	J	The MS and/or MSD recovery(ies) were above the acceptable limits indicating possible matrix interference.
Cobalt, Total Recoverable	BP-CMN-SS-09-00	10163634009	6 mg/kg	J	The MS and/or MSD recovery(ies) were above the acceptable limits indicating possible matrix interference.
Cobalt, Total Recoverable	BP-CMN-SS-09-04	10163634010	11.2 mg/kg	J	The MS and/or MSD recovery(ies) were above the acceptable limits indicating possible matrix interference.

ATTACHMENT A

CHAIN-OF-CUSTODY CONFIRMATION

HERRERA

September 22, 2011

Gina Catarra
Herrera Environmental Consultants
101 East Broadway, Suite 610
Missoula, MT 59802

Chain of Custody Confirmation

I, Gina Catarra, representing Herrera Environmental Consultants for the Black Pine Mine site, do confirm the following information inadvertently left off the chain-of-custody (CoC) provided with data set 10163635. In addition, I do confirm that all soil samples were provided to the laboratory in the proper, method-referenced, containers and were properly preserved (chemically and physically). The information identified in bold italics will be used to further clarify the CoC documentation.

Analyses by modified Sobek 3.2 were inadvertently requested for samples CMN-SS-15 and CMN-SS-16. Based on correspondence with the project team, this analysis was not performed.

To the best of my knowledge, the above information is correct.

FIRST NAME LAST NAME

9/22/11
DATE

This confirmation is an amendment to the chain-of-custody accompanying the Black Pine Mine Reclamation Phase, Pace Analytical Services, Inc. – Billings, MT data set 10163635.

ATTACHMENT A-7

DATA VALIDATION REPORT FOR DATA SETS 10163643, 10163644, AND 10163645

Tier II Data Validation Report Summary

Client: Herrera Environmental Consultants	Laboratory: Pace Analytical Services, Inc. – Billings, MT
Project Name: Black Pine Mine Reclamation Phase	Sample Matrix: Water
Project Number: 776-012-002	Sample Start Date: 07/14/2011
Date Validated: 09/12/2011	Sample End Date: 07/15/2011
Parameters Included: Total Recoverable Metals (Sb, As, Ba, Cd, Co, Cr, Cu, Fe, Pb, Mn, Ni, and Zn) by Method 6020, Mercury by Solid Waste 846 (SW-846) Method 7471A, Acid Base Accounting by Modified Sobek 3.2, pH, Saturated Paste by American Society of Agronomy (ASA) 10-3.2, Specific Conductance Saturated Paste by ASA 10-3.3, Available Phosphorous by ASA 24-5.4 and Standard Methods (SM) 4500, Organic Matter by ASA 29-3.5.2, Available Nitrate by ASA 33-3.2 and EPA 353.2, Coarse Fragment by ASTM D421, Potassium by Contract Laboratory Program (CLP) Inductively Coupled Plasma (ICP) Atomic Emission Spectroscopy (AES) Montana Department of Environmental Quality (MDEQ) Methodology, Cation Exchange Capacity by EPA 9081, and Percent Moisture by USEPA CLP Method	
Laboratory Project ID: 10163643, 10163644, and 10163645	
Data Validator: Justin Hildenbrand, Environmental Chemist	

DATA EVALUATION CRITERIA SUMMARY

A Tier II Data Validation was performed by Trihydro's Chemical Data Evaluation Services Group on the analytical data report package generated by Pace Analytical Services, Inc., in Billings, MT, evaluating samples from Black Pine Mine site, located in Granite, Montana.

Precision, accuracy, method compliance, and completeness of this data package were assessed during this data review. Precision was determined by evaluating the calculated relative percent difference (RPD) values of samples from field duplicate pairs and laboratory duplicate pairs. Laboratory accuracy was established by reviewing the demonstrated percent recoveries of matrix spike (MS) and matrix spike duplicate (MSD) samples, and of laboratory control samples (LCS) to verify that data are not biased. Method compliance was established by reviewing holding times, detection limits, surrogate recoveries, method blanks, and the LCS percent recoveries against method-specific requirements. Completeness was evaluated by determining the overall ratio of the number of samples planned versus the number of samples with valid analyses. Determination of completeness included a review of the chain-of-custody (CoC), laboratory analytical methods, and other necessary documents associated with this analytical data set.

Data were evaluated in general accordance with validation criteria set forth in the United States Environmental Protection Agency (USEPA) CLP National Functional Guidelines for Inorganic Superfund Data Review, document number EPA 540R-10-011, January 2010.

Tier II Data Validation Report Summary

SAMPLE NUMBERS TABLE

Client Sample ID	Laboratory Sample Number
Data Set 10163643	
BP-CML-TS-07-00	10163643001
BP-CML-TS-07-02	10163643002
BP-CML-SS-07-05	10163643003
BP-CML-TS-08-00	10163643004
BP-CML-TS-08-05	10163643005
BP-CML-SS-08-07	10163643006
BP-CML-TS-09-00	10163643007
BP-CML-TS-09-02	10163643008
BP-CML-TS-09-04	10163643009
BP-CML-TS-09-06	10163643010
Data Set 10163644	
BP-CMN-SS-10-00	10163644001
BP-CMN-SS-10-04	10163644002
BP-CMN-SS-14-00	10163644003
BP-CMN-SS-14-04	10163644004
BP-CMN-SS-13-00	10163644005
BP-CMN-SS-13-04	10163644006
BP-CMN-SS-12-00	10163644007
BP-CMN-SS-12-04	10163644008
BP-CMN-SS-11-00	10163644009
BP-CMN-SS-11-04	10163644010
Data Set 10163645	
BP-CML-TS-11-01	10163645001
BP-CML-TS-11-08	10163645002
BP-CML-TS-10-00	10163645003
BP-CML-TS-10-02	10163645004
BP-CML-SS-10-06	10163645005
BP-CML-TS-01-00	10163645006
BP-CML-TS-01-02	10163645007
BP-CML-SS-01-06	10163645008
BP-CML-TS-02-00	10163645009
BP-CML-TS-02-02	10163645010
BP-CML-SS-02-06	10163645011
BP-CML-TS-03-00	10163645012
BP-CML-TS-03-02	10163645013
BP-CML-SS-03-06	10163645014

Tier II Data Validation Report Summary

The samples were analyzed for the required analytes. Assessment of CoC completeness is included in Section #3. The laboratory data were reviewed to evaluate compliance with the required methods and the quality of the reported data. A leading check mark (✓) indicates that the referenced validation criteria were deemed acceptable. A preceding crossed circle (⊗) indicates validation criteria for which the data may have been qualified by the data validator. Details are noted in the tables below.

Validation Criteria

- ✓ Data Completeness
- ✓ CoC Documentation
- ✓ Holding Times and Preservation
- ✓ Initial Calibration Verifications
- ✓ Laboratory Blanks
- ✓ LCSs
- ⊗ MS/MSDs
- ⊗ Laboratory Duplicates
- ✓ Equipment Rinsate

OVERALL DATA PACKAGE ASSESSMENT

Based on a data validation review, the data are acceptable as delivered; exceptions (i.e., rejected data) are noted below. Data qualified by the laboratory are discussed in Section #2.

The purpose of validating data and assigning qualifiers is to assist in proper data interpretation. Data which are not qualified meet the site data quality objectives. If values are assigned qualifiers other than an R (rejected, data not usable), the data may be used for site evaluation, with the reasons for qualification being given consideration when interpreting sample concentrations. Data points which are assigned an R qualifier should not be used for site evaluation purposes. Text identified in **bold font** indicates that further action and/or qualification of the data were required. Data were qualified with J data flags by the laboratory if the result was greater than or equal to the method detection limit (MDL) but less than the reporting limit (RL). Laboratory J flags were preserved in the data and included in the Data Qualification Summary table at the end of this report. Additional data validation qualifiers were added for the items noted with crossed circles, above. Please see the Data Qualification Summary table at the end of this report for a complete list of samples and analytes qualified.

Data qualifiers used during this validation included:

J – Estimated concentration

UJ – Estimated reporting limit

Data Completeness

The analyses were performed as requested on the CoC records. The associated samples were received by the laboratory and analyzed properly. No data points were rejected. The completeness of the data validated was measured to be 100%.

VALIDATION CRITERIA CHECKLIST	
1. Was the report free of non-conformances related to the analytical data identified by the laboratory?	No
Comments: The laboratory noted the following non-conformances related to the analytical data. 6020: Data Sets 10163643, 10163644, and 10163645: Several matrix spike and matrix spike duplicate recoveries were not evaluated against control limits due to sample dilution. Data Sets 10163643 and 10163644: Analyte concentrations for copper and lead exceeded calibration range for the MS and/or the MSD. The reported results are estimated. 7471A: Data Sets 10163643, 10163644, and 10163645: Several matrix spike and matrix spike duplicate recoveries were not evaluated against control limits due to sample dilution. Data Sets 10163643, 10163644, and 10163645: Matrix spike recoveries exceeded QC limits in several cases. The laboratory accepted the data based on the LCS recoveries. ASA 10-3.3: Data Sets 10163644 and 10163645: Several field duplicate RPDs between the sample and sample duplicate exceeded laboratory control limits.	
2. Were data qualification flags or other notes used by the laboratory? If yes, define.	Yes
Comments: The following data qualifiers were applied to the sample data by the laboratory. D6: The RPD between the sample and sample duplicate exceeded laboratory control limits. M1: Matrix spike recovery exceeded QC limits. Batch accepted based on the LCS recovery. M6: Matrix spike and Matrix spike duplicate recovery not evaluated against control limits due to sample dilution. E: Analyte concentration exceeded the calibration range. The reported result is estimated.	
3. Were sample CoC forms complete?	Yes
Comments: The CoC records from field to laboratory were complete, and custody was maintained as evidenced by field and laboratory personnel signatures, dates, and times of receipt.	
4. Were detection limits in accordance with the quality assurance project plan (QAPP), permit, or method, or indicated as acceptable?	Yes
Comments: Dilutions were applied for several analyses in this sample set. 6020: The samples required dilutions of 20 to 1000 times for the metals analyses in some samples. 7471A: The samples required dilutions of 10 to 250 times for the mercury analyses in some samples. CLP ICP AES MDEQ: Dilutions of 5 times were applied to the analysis of potassium. 9081: Dilutions of 10 times were applied. The dilutions were reviewed and were determined to be acceptable for evaluation of laboratory data quality.	
5. Were the requested analytical methods in compliance with the QAPP, permit, or CoC?	Yes
Comments: The analytical methods were in accordance with project requirements.	
6. Were samples received in good condition within method specified requirements?	Yes
Comments: Samples were received on ice, in good condition, with the cooler temperature within the recommended temperature range of 4°C +/- 2°C at 3.0°C to 4.4°C as noted on the Sample Condition Upon Receipt forms. The sample containers were reported to be intact.	

VALIDATION CRITERIA CHECKLIST	
7. Were samples analyzed within method specified or technical holding times?	Yes
Comments: Samples were extracted and analyzed within method specified holding times.	
8. Were reported units appropriate for the sample matrix/matrices and method(s) of analyses?	Yes
Comments: Metals data were reported in units of mg/kg in dry weight for soil analyses. Moisture data were reported in units of percent. Data for the modified Sobek method were reported in units of tons/1000, standard units for pH, and weight percent (%w/w). Specific conductance was reported in units of mmhos/cm, and cation exchange capacity was measured in units of meq/100g. These units are appropriate for the respective methods and for the soil matrix.	
9. Do the laboratory reports include all constituents requested to be reported?	Yes
Comments: Reported constituents were in accordance with the CoC.	
10. Was there indication from the laboratory that the initial or continuing calibration verification results were within acceptable limits?	Yes
Comments: Calibration results were not reported with samples of this data set. However, it is assumed that calibration results were acceptable since the laboratory did not report non-conformances.	
11. Was the total number of laboratory blank samples prepared equal to at least 5% of the total number of samples, or analyzed as required by the method?	Yes
Comments: Laboratory blanks were reported on a greater than 5% basis for all methods, with the exceptions of percent moisture, the SMP buffer pH for the modified Sobek method, and analysis by ASA 10-3.2. Method blanks were not reported nor were required for these analyses.	
12. Were laboratory blank samples free of analyte contamination?	Yes
Comments: The method blank samples were reported to be free of analyte contamination.	

VALIDATION CRITERIA CHECKLIST

13. Was the total number of matrix spike samples prepared equal to at least 5% of the total number of samples, or analyzed as required by the method? Yes

Comments: The total number of MS/MSD samples was equal to at least 5% of the total number of samples for each analysis and batch, with the exceptions of analyses for percent moisture, Modified Sobek 3.2, Method 9081, and the ASA methodologies, which do not require MS/MSDs. The project samples used to prepare the MS and MSD samples are summarized in the table below.

Analysis	Batch	Parent Sample	Parent Data Set
6020	MPRP/27164	BP-CML-TS-07-00	10163643
6020	MPRP/27164	BP-CMN-SS-10-00	10163644
7471	MERP/5650	BP-CMN-SS-09-00	10163634
7471	MERP/5650	BP-CML-TS-09-04	10163643
7471	MERP/5651	BP-CML-TS-09-06	10163643
7471	MERP/5651	BP-CML-TS-02-00	10163645
6020	MPRP/27164	BP-CML-TS-07-00	10163643
6020	MPRP/27164	BP-CMN-SS-10-00	10163644
7471	MERP/5651	BP-CML-TS-09-06	10163643
7471	MERP/5651	BP-CML-TS-02-00	10163645

Analysis	Batch	Parent Sample	Parent Data Set
6020	MPRP/27165	BP-CML-TS-11-01	10163645
6020	MPRP/27165	BP-CML-SS-02-06	10163645
7471	MERP/5651	BP-CML-TS-09-06	10163643
7471	MERP/5651	BP-CML-TS-02-00	10163645

Two MS/MSDs for Method 7471A batch MERP/5669 were prepared from samples not associated with this sample event.

14. Were MS/MSD percent recoveries and MS/MSD RPDs within data validation or laboratory QC limits? No

Comments: The MS/MSD percent recoveries and RPD data for project samples were within laboratory or data validation QC limits, were not evaluated due to sample dilution, or were not evaluated since the amount spiked was less than four times the amount of analyte measured to be in the original sample, with the following exceptions.

Analysis	Data Set	Batch	Analyte	MS Recovery	MSD Recovery	MS/MSD Limits	RPD	RPD Limit
6020	**10163643 10163644**	**MPRP/27164**	**Cadmium**	**Acceptable**	**Acceptable**	**75-125%**	**33%**	**20%**
6020	**10163643 10163644**	**MPRP/27164**	**Chromium**	**Acceptable**	**Acceptable**	**75-125%**	**35%**	**20%**
6020	**10163643 10163644**	**MPRP/27164**	**Cobalt**	**Acceptable**	**71%**	**75-125%**	**36%**	**20%**
7471A	**10163643**	**MERP/5650**	**Mercury**	**25%**	**35%**	**75-125%**	**27%**	**20%**
7471A	**10163643 10163644 10163645**	**MERP/5651**	**Mercury**	**39%**	**N/A**	**75-125%**	**N/A**	**N/A**

Mercury, cadmium, cobalt, and chromium data for associated samples were qualified as J for detections and UJ for non-detections due to possible low bias and due to evidence of poor precision.

VALIDATION CRITERIA CHECKLIST	
15. Was the total number of LCSs analyzed equal to at least 5% of the total number of samples, or analyzed as required by the method?	Yes
Comments: The total number of LCSs were equal to at least 5% of the total number of samples, with the exceptions of analyses for percent moisture for the Modified Sobek 3.2 analyses, and for ASA_10-3.2. Analyses of LCSs were neither prepared nor required for these methods.	
16. Were LCS/LCSD percent recoveries and LCS/LCSD RPDs within data validation or laboratory QC limits?	No
Comments: The LCS percent recoveries were within laboratory QC limits, with the following exception. Potassium was outside of the laboratory QC limits of 80-21% at 135% in the LCSD for CLP ICP AES MDEQ batch MPRP/27469 in data sets 10163644 and 10163645, indicating a possible high bias. The associated data were non-detect and therefore no qualification was necessary.	
17. Were surrogate recoveries within laboratory QC limits?	N/A
Comments: Surrogates are not required for the reported methods.	
18. Was the number of equipment, trip, or field blanks collected compliant with the project guidelines, quality assurance project plan (QAPP), sample analysis plan (SAP), or permit?	No
Comments: Equipment, trip, and field blanks were not collected with the samples of this data set. One rinsate blank (BP-QC-WT-T1) was collected for this sampling period in data set 10163606 to evaluate possible equipment sources of contamination.	
19. Were the trip blank, field blank, and/or equipment blank samples free of analyte contamination?	No
Comments: Detections were not reported in the rinsate blank, with the following exception. Total recoverable lead was detected at 0.47 µg/L in the rinsate blank. Qualification was not required since total recoverable lead was detected in the samples at both greater than the reporting limit and greater than ten times the amount in the rinsate blank.	
20. Was the number of field duplicates collected compliant with the project guidelines, QAPP, SAP, or permit?	No
Comments: Field duplicates were not submitted with the sample sets.	
21. Were field duplicate RPD values within data validation QC limits (soil 0-50%)?	N/A
Comments: Field duplicates were not submitted with the sample sets.	

VALIDATION CRITERIA CHECKLIST

22. Were laboratory duplicate RPD values within laboratory QC limits? No

Comments: Laboratory duplicates were not prepared for Methods 6020, CLP ICP AES MDEQ, or 7471A. Laboratory duplicates were prepared for the remaining sample analyses. The project samples used for the laboratory duplicate sample analyses are summarized in the table below.

Data Set	Analysis	Batch	Parent Sample	Data Set
10163644 10163645	EPA 9081	ICP/14917	BP-CML-TS-11-01	10163645
10163643	% Moisture	MPRP/27293	BP-CML-TS-09-02 BP-CMN-SS-07-06	10163643 10163634
10163643 10163644 10163645	% Moisture	MPRP/27306	BP-CML-SS-01-06 BP-CML-TS-09-04	10163645 10163643
10163645	% Moisture	MPRP/27307	BP-CML-TS-02-00 CML-SD-32-00	10163645 10163437
10163644 10163645	CLPICPAES	MPRP/27469	BP-CMN-SS-08-03 BP-CMN-SS-11-04	10163634 10163644
10163644 10163645	ASA 10-3.2	MT/6426	BP-CML-TS-11-01 BP-RY-SS-03-14	10163645 10163246
10163644 10163645	ASA 29-3.5.2	MT/6438	BP-CMN-SS-08-03 BP-RY-SS-01-00	10163634 10163246
10163644 10163645	ASA 33-3.2/EPA 353.2	MT/6442	BP-CMN-SS-12-04 BP-RY-SS-03-14	10163644 10163246
10163644 10163645	ASA 24-5.4/SM4500	MT/6443	BP-CMN-SS-13-04 BP-RY-SS-03-14	10163644 10163246
10163644	Modified Sobek 3.2	MT/6452	BP-HM-RS-03-01 BP-RY-SS-04-02	10163606 10163246
10163644	Modified Sobek 3.2	MT/6480	BP-HM-RS-03-01 BP-RY-SS-04-02	10163606 10163246
10163644	Modified Sobek 3.2	MT/6481	BP-HM-RS-03-01 BP-RY-SS-04-02	10163606 10163246
10163643 10163644	Modified Sobek 3.2	MT/6488	BP-CML-TS-08-05 BP-CMN-SS-04-00	10163643 10163634
10163645	Modified Sobek 3.2	MT/6489	BP-CML-TS-11-01	10163645
10163643 10163644	Modified Sobek 3.2	MT/6497	BP-CML-TS-06-02 BP-CMN-SS-04-00	10163640 10163634
10163645	Modified Sobek 3.2	MT/6498	BP-CML-TS-11-01	10163645
10163643 10163644	Modified Sobek 3.2	MT/6543	BP-CML-TS-08-05 BP-CMN-SS-04-00	10163643 10163634
10163645	Modified Sobek 3.2	MT/6544	BP-CML-TS-11-01	10163645
10163644 10163645	ASA 10-3.3	MT/6547	BP-CML-TS-11-01 BP-RY-SS-03-14	10163645 10163246

The laboratory duplicate RPD values were within laboratory QC limits, or were not applicable since one or both sample results were either non-detect or were detected at less than five times the laboratory reporting limit, with the following exception.

The RPD for the analysis of specific conductance in saturate paste, ASA method 10-3.3 batch MT/6547, in data sets 10163644 and 10163645, was outside of laboratory QC limits of 0-20% at 33%. Associated sample data were detections and were qualified as J due to possible poor precision.

DATA QUALIFICATION SUMMARY

Analyte	Client Sample ID	Laboratory Assigned ID	Laboratory Result	Reviewer Qualifier	Reason for Qualification
Specific Conductance, Saturated Paste	BP-CMN-SS-13-04	10163644006	204 mmhos/cm	J	Laboratory duplicate RPD outside QC limits
Specific Conductance, Saturated Paste	BP-CMN-SS-12-04	10163644008	0.91 mmhos/cm	J	Laboratory duplicate RPD outside QC limits
Specific Conductance, Saturated Paste	BP-CMN-SS-11-04	10163644010	0.37 mmhos/cm	J	Laboratory duplicate RPD outside QC limits
Specific Conductance, Saturated Paste	BP-CML-TS-11-01	10163645001	0.2 mmhos/cm	J	Laboratory duplicate RPD outside QC limits
Specific Conductance, Saturated Paste	BP-CML-TS-11-08	10163645002	0.17 mmhos/cm	J	Laboratory duplicate RPD outside QC limits
Mercury, Total	BP-CML-TS-09-06	10163643010	4.1 mg/kg	J	The MS and/or MSD recovery(ies) were below the acceptable limits indicating possible matrix interference.
Mercury, Total	BP-CMN-SS-10-00	10163644001	0.044 mg/kg	J	The MS and/or MSD recovery(ies) were below the acceptable limits indicating possible matrix interference.
Mercury, Total	BP-CMN-SS-10-04	10163644002	0.043 mg/kg	J	The MS and/or MSD recovery(ies) were below the acceptable limits indicating possible matrix interference.
Mercury, Total	BP-CMN-SS-14-00	10163644003	0.13 mg/kg	J	The MS and/or MSD recovery(ies) were below the acceptable limits indicating possible matrix interference.
Mercury, Total	BP-CMN-SS-14-04	10163644004	0.022 mg/kg	J	The MS and/or MSD recovery(ies) were below the acceptable limits indicating possible matrix interference.
Mercury, Total	BP-CMN-SS-13-00	10163644005	1.4 mg/kg	J	The MS and/or MSD recovery(ies) were below the acceptable limits indicating possible matrix interference.
Mercury, Total	BP-CMN-SS-13-04	10163644006	0.026 mg/kg	J	The MS and/or MSD recovery(ies) were below the acceptable limits indicating possible matrix interference.

Analyte	Client Sample ID	Laboratory Assigned ID	Laboratory Result	Reviewer Qualifier	Reason for Qualification
Mercury, Total	BP-CMN-SS-12-00	10163644007	0.062 mg/kg	J	The MS and/or MSD recovery(ies) were below the acceptable limits indicating possible matrix interference.
Mercury, Total	BP-CMN-SS-12-04	10163644008	0.029 mg/kg	J	The MS and/or MSD recovery(ies) were below the acceptable limits indicating possible matrix interference.
Mercury, Total	BP-CMN-SS-11-00	10163644009	0.07 mg/kg	J	The MS and/or MSD recovery(ies) were below the acceptable limits indicating possible matrix interference.
Mercury, Total	BP-CMN-SS-11-04	10163644010	0.03 mg/kg	J	The MS and/or MSD recovery(ies) were below the acceptable limits indicating possible matrix interference.
Mercury, Total	BP-CML-TS-11-01	10163645001	0.023 mg/kg	J	The MS and/or MSD recovery(ies) were below the acceptable limits indicating possible matrix interference.
Mercury, Total	BP-CML-TS-11-08	10163645002	6.8 mg/kg	J	The MS and/or MSD recovery(ies) were below the acceptable limits indicating possible matrix interference.
Mercury, Total	BP-CML-TS-10-00	10163645003	0.33 mg/kg	J	The MS and/or MSD recovery(ies) were below the acceptable limits indicating possible matrix interference.
Mercury, Total	BP-CML-TS-10-02	10163645004	0.59 mg/kg	J	The MS and/or MSD recovery(ies) were below the acceptable limits indicating possible matrix interference.
Mercury, Total	BP-CML-SS-10-06	10163645005	0.77 mg/kg	J	The MS and/or MSD recovery(ies) were below the acceptable limits indicating possible matrix interference.
Mercury, Total	BP-CML-TS-01-00	10163645006	0.24 mg/kg	J	The MS and/or MSD recovery(ies) were below the acceptable limits indicating possible matrix interference.
Mercury, Total	BP-CML-TS-01-02	10163645007	1 mg/kg	J	The MS and/or MSD recovery(ies) were below the acceptable limits indicating possible matrix interference.
Mercury, Total	BP-CML-SS-01-06	10163645008	0.35 mg/kg	J	The MS and/or MSD recovery(ies) were below the acceptable limits indicating possible matrix interference.

Analyte	Client Sample ID	Laboratory Assigned ID	Laboratory Result	Reviewer Qualifier	Reason for Qualification
Mercury, Total	BP-CML-TS-02-00	10163645009	0.3 mg/kg	J	The MS and/or MSD recovery(ies) were below the acceptable limits indicating possible matrix interference.
Cadmium, Total Recoverable	BP-CML-TS-07-00	10163643001	7.5 mg/kg	J	The RPD for the MS/MSD or LCS/LCSD was greater than the acceptable difference indicating poor repeatability.
Cadmium, Total Recoverable	BP-CML-TS-07-02	10163643002	12.5 mg/kg	J	The RPD for the MS/MSD or LCS/LCSD was greater than the acceptable difference indicating poor repeatability.
Cadmium, Total Recoverable	BP-CML-SS-07-05	10163643003	1.5 mg/kg	J	The RPD for the MS/MSD or LCS/LCSD was greater than the acceptable difference indicating poor repeatability.
Cadmium, Total Recoverable	BP-CML-TS-08-00	10163643004	4.3 mg/kg	J	The RPD for the MS/MSD or LCS/LCSD was greater than the acceptable difference indicating poor repeatability.
Cadmium, Total Recoverable	BP-CML-TS-08-05	10163643005	8.2 mg/kg	J	The RPD for the MS/MSD or LCS/LCSD was greater than the acceptable difference indicating poor repeatability.
Cadmium, Total Recoverable	BP-CML-SS-08-07	10163643006	0.12 mg/kg	J	The RPD for the MS/MSD or LCS/LCSD was greater than the acceptable difference indicating poor repeatability.
Cadmium, Total Recoverable	BP-CML-TS-09-00	10163643007	49.2 mg/kg	J	The RPD for the MS/MSD or LCS/LCSD was greater than the acceptable difference indicating poor repeatability.
Cadmium, Total Recoverable	BP-CML-TS-09-02	10163643008	13.2 mg/kg	J	The RPD for the MS/MSD or LCS/LCSD was greater than the acceptable difference indicating poor repeatability.
Cadmium, Total Recoverable	BP-CML-TS-09-04	10163643009	35.2 mg/kg	J	The RPD for the MS/MSD or LCS/LCSD was greater than the acceptable difference indicating poor repeatability.
Cadmium, Total Recoverable	BP-CML-TS-09-06	10163643010	99.9 mg/kg	J	The RPD for the MS/MSD or LCS/LCSD was greater than the acceptable difference indicating poor repeatability.
Cadmium, Total Recoverable	BP-CMN-SS-10-00	10163644001	1.4 mg/kg	J	The RPD for the MS/MSD or LCS/LCSD was greater than the acceptable difference indicating poor repeatability.

Analyte	Client Sample ID	Laboratory Assigned ID	Laboratory Result	Reviewer Qualifier	Reason for Qualification
Cadmium, Total Recoverable	BP-CMN-SS-10-04	10163644002	0.32 mg/kg	J	The RPD for the MS/MSD or LCS/LCSD was greater than the acceptable difference indicating poor repeatability.
Cadmium, Total Recoverable	BP-CMN-SS-14-00	10163644003	2.8 mg/kg	J	The RPD for the MS/MSD or LCS/LCSD was greater than the acceptable difference indicating poor repeatability.
Cadmium, Total Recoverable	BP-CMN-SS-14-04	10163644004	6.9 mg/kg	J	The RPD for the MS/MSD or LCS/LCSD was greater than the acceptable difference indicating poor repeatability.
Cadmium, Total Recoverable	BP-CMN-SS-13-00	10163644005	11.2 mg/kg	J	The RPD for the MS/MSD or LCS/LCSD was greater than the acceptable difference indicating poor repeatability.
Cadmium, Total Recoverable	BP-CMN-SS-13-04	10163644006	ND(0.093 mg/kg)	UJ	The RPD for the MS/MSD or LCS/LCSD was greater than the acceptable difference indicating poor repeatability.
Cadmium, Total Recoverable	BP-CMN-SS-12-00	10163644007	1.1 mg/kg	J	The RPD for the MS/MSD or LCS/LCSD was greater than the acceptable difference indicating poor repeatability.
Cadmium, Total Recoverable	BP-CMN-SS-12-04	10163644008	0.19 mg/kg	J	The RPD for the MS/MSD or LCS/LCSD was greater than the acceptable difference indicating poor repeatability.
Cadmium, Total Recoverable	BP-CMN-SS-11-00	10163644009	1.2 mg/kg	J	The RPD for the MS/MSD or LCS/LCSD was greater than the acceptable difference indicating poor repeatability.
Cadmium, Total Recoverable	BP-CMN-SS-11-04	10163644010	ND(0.079 mg/kg)	UJ	The RPD for the MS/MSD or LCS/LCSD was greater than the acceptable difference indicating poor repeatability.
Chromium, Total Recoverable	BP-CML-TS-07-00	10163643001	3.7 mg/kg	J	The RPD for the MS/MSD or LCS/LCSD was greater than the acceptable difference indicating poor repeatability.
Chromium, Total Recoverable	BP-CML-TS-07-02	10163643002	ND(0.52 mg/kg)	UJ	The RPD for the MS/MSD or LCS/LCSD was greater than the acceptable difference indicating poor repeatability.
Chromium, Total Recoverable	BP-CML-SS-07-05	10163643003	5.2 mg/kg	J	The RPD for the MS/MSD or LCS/LCSD was greater than the acceptable difference indicating poor repeatability.

Analyte	Client Sample ID	Laboratory Assigned ID	Laboratory Result	Reviewer Qualifier	Reason for Qualification
Chromium, Total Recoverable	BP-CML-TS-08-00	10163643004	2.8 mg/kg	J	The RPD for the MS/MSD or LCS/LCSD was greater than the acceptable difference indicating poor repeatability.
Chromium, Total Recoverable	BP-CML-TS-08-05	10163643005	ND(0.52 mg/kg)	UJ	The RPD for the MS/MSD or LCS/LCSD was greater than the acceptable difference indicating poor repeatability.
Chromium, Total Recoverable	BP-CML-SS-08-07	10163643006	5.4 mg/kg	J	The RPD for the MS/MSD or LCS/LCSD was greater than the acceptable difference indicating poor repeatability.
Chromium, Total Recoverable	BP-CML-TS-09-00	10163643007	ND(0.64 mg/kg)	UJ	The RPD for the MS/MSD or LCS/LCSD was greater than the acceptable difference indicating poor repeatability.
Chromium, Total Recoverable	BP-CML-TS-09-02	10163643008	ND(0.49 mg/kg)	UJ	The RPD for the MS/MSD or LCS/LCSD was greater than the acceptable difference indicating poor repeatability.
Chromium, Total Recoverable	BP-CML-TS-09-04	10163643009	ND(0.54 mg/kg)	UJ	The RPD for the MS/MSD or LCS/LCSD was greater than the acceptable difference indicating poor repeatability.
Chromium, Total Recoverable	BP-CML-TS-09-06	10163643010	ND(0.56 mg/kg)	UJ	The RPD for the MS/MSD or LCS/LCSD was greater than the acceptable difference indicating poor repeatability.
Chromium, Total Recoverable	BP-CMN-SS-10-00	10163644001	3.3 mg/kg	J	The RPD for the MS/MSD or LCS/LCSD was greater than the acceptable difference indicating poor repeatability.
Chromium, Total Recoverable	BP-CMN-SS-10-04	10163644002	4.8 mg/kg	J	The RPD for the MS/MSD or LCS/LCSD was greater than the acceptable difference indicating poor repeatability.
Chromium, Total Recoverable	BP-CMN-SS-14-00	10163644003	6.8 mg/kg	J	The RPD for the MS/MSD or LCS/LCSD was greater than the acceptable difference indicating poor repeatability.
Chromium, Total Recoverable	BP-CMN-SS-14-04	10163644004	4.3 mg/kg	J	The RPD for the MS/MSD or LCS/LCSD was greater than the acceptable difference indicating poor repeatability.
Chromium, Total Recoverable	BP-CMN-SS-13-00	10163644005	ND(3 mg/kg)	UJ	The RPD for the MS/MSD or LCS/LCSD was greater than the acceptable difference indicating poor repeatability.

Analyte	Client Sample ID	Laboratory Assigned ID	Laboratory Result	Reviewer Qualifier	Reason for Qualification
Chromium, Total Recoverable	BP-CMN-SS-13-04	10163644006	9.4 mg/kg	J	The RPD for the MS/MSD or LCS/LCSD was greater than the acceptable difference indicating poor repeatability.
Chromium, Total Recoverable	BP-CMN-SS-12-00	10163644007	4.3 mg/kg	J	The RPD for the MS/MSD or LCS/LCSD was greater than the acceptable difference indicating poor repeatability.
Chromium, Total Recoverable	BP-CMN-SS-12-04	10163644008	8.2 mg/kg	J	The RPD for the MS/MSD or LCS/LCSD was greater than the acceptable difference indicating poor repeatability.
Chromium, Total Recoverable	BP-CMN-SS-11-00	10163644009	4.8 mg/kg	J	The RPD for the MS/MSD or LCS/LCSD was greater than the acceptable difference indicating poor repeatability.
Chromium, Total Recoverable	BP-CMN-SS-11-04	10163644010	6.2 mg/kg	J	The RPD for the MS/MSD or LCS/LCSD was greater than the acceptable difference indicating poor repeatability.
Mercury, Total	BP-CML-TS-07-00	10163643001	215 mg/kg	J	The RPD for the MS/MSD or LCS/LCSD was greater than the acceptable difference indicating poor repeatability.
Mercury, Total	BP-CML-TS-07-02	10163643002	221 mg/kg	J	The RPD for the MS/MSD or LCS/LCSD was greater than the acceptable difference indicating poor repeatability.
Mercury, Total	BP-CML-SS-07-05	10163643003	67.5 mg/kg	J	The RPD for the MS/MSD or LCS/LCSD was greater than the acceptable difference indicating poor repeatability.
Mercury, Total	BP-CML-TS-08-00	10163643004	10.8 mg/kg	J	The RPD for the MS/MSD or LCS/LCSD was greater than the acceptable difference indicating poor repeatability.
Mercury, Total	BP-CML-TS-08-05	10163643005	7.4 mg/kg	J	The RPD for the MS/MSD or LCS/LCSD was greater than the acceptable difference indicating poor repeatability.
Mercury, Total	BP-CML-SS-08-07	10163643006	130 mg/kg	J	The RPD for the MS/MSD or LCS/LCSD was greater than the acceptable difference indicating poor repeatability.
Mercury, Total	BP-CML-TS-09-00	10163643007	ND(0.024 mg/kg)	UJ	The RPD for the MS/MSD or LCS/LCSD was greater than the acceptable difference indicating poor repeatability.

Analyte	Client Sample ID	Laboratory Assigned ID	Laboratory Result	Reviewer Qualifier	Reason for Qualification
Mercury, Total	BP-CML-TS-09-02	10163643008	0.64 mg/kg	J	The RPD for the MS/MSD or LCS/LCSD was greater than the acceptable difference indicating poor repeatability.
Mercury, Total	BP-CML-TS-09-04	10163643009	137 mg/kg	J	The RPD for the MS/MSD or LCS/LCSD was greater than the acceptable difference indicating poor repeatability.
Cobalt, Total Recoverable	BP-CML-TS-07-00	10163643001	4.3 mg/kg	J	The MS and/or MSD recovery(ies) were below the acceptable limits indicating possible matrix interference.
Cobalt, Total Recoverable	BP-CML-TS-07-02	10163643002	0.93 mg/kg	J	The MS and/or MSD recovery(ies) were below the acceptable limits indicating possible matrix interference.
Cobalt, Total Recoverable	BP-CML-SS-07-05	10163643003	43.1 mg/kg	J	The MS and/or MSD recovery(ies) were below the acceptable limits indicating possible matrix interference.
Cobalt, Total Recoverable	BP-CML-TS-08-00	10163643004	2.3 mg/kg	J	The MS and/or MSD recovery(ies) were below the acceptable limits indicating possible matrix interference.
Cobalt, Total Recoverable	BP-CML-TS-08-05	10163643005	4.2 mg/kg	J	The MS and/or MSD recovery(ies) were below the acceptable limits indicating possible matrix interference.
Cobalt, Total Recoverable	BP-CML-SS-08-07	10163643006	14.4 mg/kg	J	The MS and/or MSD recovery(ies) were below the acceptable limits indicating possible matrix interference.
Cobalt, Total Recoverable	BP-CML-TS-09-00	10163643007	4.8 mg/kg	J	The MS and/or MSD recovery(ies) were below the acceptable limits indicating possible matrix interference.
Cobalt, Total Recoverable	BP-CML-TS-09-02	10163643008	2.5 mg/kg	J	The MS and/or MSD recovery(ies) were below the acceptable limits indicating possible matrix interference.
Cobalt, Total Recoverable	BP-CML-TS-09-04	10163643009	1.7 mg/kg	J	The MS and/or MSD recovery(ies) were below the acceptable limits indicating possible matrix interference.
Cobalt, Total Recoverable	BP-CML-TS-09-06	10163643010	14.6 mg/kg	J	The MS and/or MSD recovery(ies) were below the acceptable limits indicating possible matrix interference.

Analyte	Client Sample ID	Laboratory Assigned ID	Laboratory Result	Reviewer Qualifier	Reason for Qualification
Cobalt, Total Recoverable	BP-CMN-SS-10-00	10163644001	4.7 mg/kg	J	The MS and/or MSD recovery(ies) were below the acceptable limits indicating possible matrix interference.
Cobalt, Total Recoverable	BP-CMN-SS-10-04	10163644002	12.7 mg/kg	J	The MS and/or MSD recovery(ies) were below the acceptable limits indicating possible matrix interference.
Cobalt, Total Recoverable	BP-CMN-SS-14-00	10163644003	5.6 mg/kg	J	The MS and/or MSD recovery(ies) were below the acceptable limits indicating possible matrix interference.
Cobalt, Total Recoverable	BP-CMN-SS-14-04	10163644004	5.1 mg/kg	J	The MS and/or MSD recovery(ies) were below the acceptable limits indicating possible matrix interference.
Cobalt, Total Recoverable	BP-CMN-SS-13-00	10163644005	4.2 mg/kg	J	The MS and/or MSD recovery(ies) were below the acceptable limits indicating possible matrix interference.
Cobalt, Total Recoverable	BP-CMN-SS-13-04	10163644006	4.3 mg/kg	J	The MS and/or MSD recovery(ies) were below the acceptable limits indicating possible matrix interference.
Cobalt, Total Recoverable	BP-CMN-SS-12-00	10163644007	2.5 mg/kg	J	The MS and/or MSD recovery(ies) were below the acceptable limits indicating possible matrix interference.
Cobalt, Total Recoverable	BP-CMN-SS-12-04	10163644008	7.5 mg/kg	J	The MS and/or MSD recovery(ies) were below the acceptable limits indicating possible matrix interference.
Cobalt, Total Recoverable	BP-CMN-SS-11-00	10163644009	4.3 mg/kg	J	The MS and/or MSD recovery(ies) were below the acceptable limits indicating possible matrix interference.
Cobalt, Total Recoverable	BP-CMN-SS-11-04	10163644010	12.6 mg/kg	J	The MS and/or MSD recovery(ies) were below the acceptable limits indicating possible matrix interference.

ATTACHMENT A-8

DATA VALIDATION REPORT FOR DATA SETS 10166973 AND 10167132

Tier II Data Validation Report Summary

Client: Herrera Environmental Consultants	Laboratory: Pace Analytical Services, Inc. – Billings, MT
Project Name: Black Pine Mine Reclamation Phase	Sample Matrix: Soil
Project Number: 776-012-002	Sample Start Date: 08/16/2011
Date Validated: 09/14/2011	Sample End Date: 08/18/2011
Parameters Included: Total Recoverable Metals (Sb, As, Ba, Cd, Co, Cr, Cu, Fe, Pb, Mn, Ni, and Zn) by Method 6020, Mercury by Solid Waste 846 (SW-846) Method 7471A, Acid Base Accounting by Modified Sobek 3.2, pH, Saturated Paste by American Society of Agronomy (ASA) 10-3.2, Specific Conductance Saturated Paste by ASA 10-3.3, Available Phosphorous by ASA 24-5.4 and Standard Methods (SM) 4500, Organic Matter by ASA 29-3.5.2, Available Nitrate by ASA 33-3.2 and EPA 353.2, Coarse Fragment by ASTM D421, Potassium by Contract Laboratory Program (CLP) Inductively Coupled Plasma (ICP) Atomic Emission Spectroscopy (AES) Montana Department of Environmental Quality (MDEQ) Methodology, Cation Exchange Capacity by EPA 9081, and Percent Moisture by USEPA CLP Method	
Laboratory Project ID: 10166973 and 10167132	
Data Validator: Justin Hildenbrand, Environmental Chemist	

DATA EVALUATION CRITERIA SUMMARY

A Tier II Data Validation was performed by Trihydro's Chemical Data Evaluation Services Group on the analytical data report package generated by Pace Analytical Services, Inc., in Billings, MT, evaluating samples from Black Pine Mine site, located in Granite, Montana.

Precision, accuracy, method compliance, and completeness of this data package were assessed during this data review. Precision was determined by evaluating the calculated relative percent difference (RPD) values of samples from field duplicate pairs and laboratory duplicate pairs. Laboratory accuracy was established by reviewing the demonstrated percent recoveries of matrix spike (MS) and matrix spike duplicate (MSD) samples, and of laboratory control samples (LCS) to verify that data are not biased. Method compliance was established by reviewing holding times, detection limits, surrogate recoveries, method blanks, and the LCS percent recoveries against method-specific requirements. Completeness was evaluated by determining the overall ratio of the number of samples planned versus the number of samples with valid analyses. Determination of completeness included a review of the chain-of-custody (CoC), laboratory analytical methods, and other necessary documents associated with this analytical data set.

Data were evaluated in general accordance with validation criteria set forth in the United States Environmental Protection Agency (USEPA) CLP National Functional Guidelines for Inorganic Superfund Data Review, document number EPA 540R-10-011, January 2010. Review of duplicates is conducted in accordance with USEPA Region 1 Laboratory Data Validation Functional Guidelines for Evaluation of Organic Analysis, December 1996 or as specified by the method (as applicable).

Tier II Data Validation Report Summary

SAMPLE NUMBERS TABLE

Client Sample ID	Laboratory Sample Number
Data Set 10166973	
BP-RY-06-00	10166973001
BP-RY-06-04	10166973002
BP-RY-07-00	10166973003
BP-RY-07-10	10166973004
BP-RY-08-00	10166973005
BP-CML-RCRA-01	10166973006
BP-CML-RCRA-02	10166973007
BP-CML-RCRA-03	10166973008
BP-CML-RCRA-04	10166973009
Data Set 10167132	
BP-CMN-SS-17	10167132001
BP-CMN-SS-18	10167132002
BP-CMN-SS-19	10167132003

Tier II Data Validation Report Summary

The samples were analyzed for the required analytes. Assessment of CoC completeness is included in Section #3. The laboratory data were reviewed to evaluate compliance with the required methods and the quality of the reported data. A leading check mark (✓) indicates that the referenced validation criteria were deemed acceptable. A preceding crossed circle (⊗) indicates validation criteria for which the data may have been qualified by the data validator. Details are noted in the tables below.

Validation Criteria

- ✓ Data Completeness
- ✓ CoC Documentation
- ✓ Holding Times and Preservation
- ✓ Initial Calibration Verifications
- ✓ Laboratory Blanks
- ⊗ LCS/LCSDs
- ✓ MS/MSDs
- ✓ Laboratory Duplicates
- ✓ Equipment Rinsate

OVERALL DATA PACKAGE ASSESSMENT

Based on a data validation review, the data are acceptable as delivered; exceptions (i.e., rejected data) are noted below. Data qualified by the laboratory are discussed in Section #2.

The purpose of validating data and assigning qualifiers is to assist in proper data interpretation. Data which are not qualified meet the site data quality objectives. If values are assigned qualifiers other than an R (rejected, data not usable), the data may be used for site evaluation, with the reasons for qualification being given consideration when interpreting sample concentrations. Data points which are assigned an R qualifier should not be used for site evaluation purposes. Text identified in **bold font** indicates that further action and/or qualification of the data were required. Data were qualified with J data flags by the laboratory if the result was greater than or equal to the method detection limit (MDL) but less than the reporting limit (RL). Laboratory J flags were preserved in the data and included in the Data Qualification Summary table at the end of this report. Additional data validation qualifiers were added for the items noted with crossed circles, above. Please see the Data Qualification Summary table at the end of this report for a complete list of samples and analytes qualified.

Data qualifiers used during this validation included:

J – Estimated concentration

Data Completeness

The analyses were performed as requested on the CoC records. The associated samples were received by the laboratory and analyzed properly. No data points were rejected. The completeness of the data validated was measured to be 100%.

VALIDATION CRITERIA CHECKLIST	
1. Was the report free of non-conformances related to the analytical data identified by the laboratory?	No
Comments: The laboratory noted the following non-conformances related to the analytical data. CLP ICP AES MDEQ: Data Sets 10166973: The recovery of potassium in the LCSs were outside of QC limits. 6020: Data Sets 10166973 and 10167132: Several matrix spike and matrix spike duplicate recoveries were not evaluated against control limits due to sample dilution. Data Set 10166973: The continuing calibration for silver is outside of Pace Analytical acceptance limits. The results may be biased high. Affected samples are a method blank (Lab ID: 1037976), BP-RY-06-04 (Lab ID: 10166973002), BP-RY-07-00 (Lab ID: 10166973003), and BP-RY-07-10 (Lab ID: 10166973004). Silver is not a target constituent for this project and therefore no further action was necessary. The concentrations for manganese and zinc exceeded the calibration range in the MS and MSD. The reported results are estimated.	
2. Were data qualification flags or other notes used by the laboratory? If yes, define.	Yes
Comments: The following data qualifiers were applied to the sample data by the laboratory. CH: The continuing calibration for this compound is outside of Pace Analytical acceptance limits. The results may be biased high. D6: The RPD between the sample and sample duplicate exceeded laboratory control limits. E: Analyte concentration exceeded the calibration range. The reported result is estimated. L0: Analyte recovery in the LCS was outside QC limits. L2: Analyte recovery in the LCS was below QC limits. Results may be biased low. M6: Matrix spike and Matrix spike duplicate recovery not evaluated against control limits due to sample dilution.	
3. Were sample CoC forms complete?	Yes
Comments: The CoC records from field to laboratory were complete, and custody was maintained as evidenced by field and laboratory personnel signatures, dates, and times of receipt.	
4. Were detection limits in accordance with the quality assurance project plan (QAPP), permit, or method, or indicated as acceptable?	Yes
Comments: Dilutions were applied for several analyses in this sample set. 6020: The samples required dilutions of 20 to 4000 times for the metals analyses. 7471A: The samples required dilutions of 10 times for the mercury analyses in some samples. 9081: A dilution of 10 times was applied for sample BP-RY-08-00. The dilutions were reviewed and were determined to be acceptable for evaluation of laboratory data quality.	
5. Were the requested analytical methods in compliance with the QAPP, permit, or CoC?	Yes
Comments: The analytical methods were in accordance with project requirements.	
6. Were samples received in good condition within method specified requirements?	Yes
Comments: Samples were received on ice, in good condition, with the cooler temperature within the recommended temperature range of 4°C +/- 2°C at 5.9°C to 6.0°C as noted on the Sample Condition Upon Receipt forms. The sample containers were reported to be intact.	

VALIDATION CRITERIA CHECKLIST	
7. Were samples analyzed within method specified or technical holding times?	Yes
Comments: Samples were extracted and analyzed within method specified holding times.	
8. Were reported units appropriate for the sample matrix/matrices and method(s) of analyses?	Yes
Comments: Metals data were reported in units of mg/kg in dry weight for soil analyses. Moisture data were reported in units of percent. Data for the modified Sobek method were reported in units of tons/1000, standard units for pH, and weight percent (%w/w). Specific conductance was reported in units of mmhos/cm, and cation exchange capacity was measured in units of meq/100g. These units are appropriate for the respective methods and for the soil matrix.	
9. Do the laboratory reports include all constituents requested to be reported?	No
Comments: Reported constituents were in accordance with the CoC. In data set 10167132, the laboratory reported selenium for sample BP-CMN-SS-17 but did not report selenium for samples BP-CMN-SS-18 or BP-CMN-SS-19. The laboratory was contacted, and it was determined that selenium was not required for these samples and was reported in error for sample PB-CMN-SS-17. No further action was required.	
10. Was there indication from the laboratory that the initial or continuing calibration verification results were within acceptable limits?	No
Comments: Calibration results were not reported with samples of this data set. However, it is assumed that most calibration results were acceptable since the laboratory did not report non-conformances.	
11. Was the total number of laboratory blank samples prepared equal to at least 5% of the total number of samples, or analyzed as required by the method?	Yes
Comments: Laboratory blanks were reported on a greater than 5% basis for all methods, with the exceptions of percent moisture, the SMP buffer pH for the modified Sobek method, and analysis by ASA 10-3.2. Method blanks were not reported nor were required for these analyses.	
12. Were laboratory blank samples free of analyte contamination?	Yes
Comments: The method blank samples were reported to be free of analyte contamination.	
13. Was the total number of matrix spike samples prepared equal to at least 5% of the total number of samples, or analyzed as required by the method?	Yes
Comments: The total number of MS/MSD samples was equal to at least 5% of the total number of samples for each analysis and batch, with the exceptions of analyses for percent moisture, Modified Sobek 3.2, Method 9081, and the ASA methodologies, which do not require MS/MSDs. In data set 10166973, one MS for Method 6020 batch MPRP/27890 was prepared from sample BP-RY-07-10, and the MS/MSD for Method 6020 batch MPRP/28161 in data set 10167132 was prepared from sample BP-CMN-SS-17. The remaining MS/MSDs were prepared from samples not associated with this sample event.	
14. Were MS/MSD percent recoveries and MS/MSD RPDs within data validation or laboratory QC limits?	No
Comments: The MS/MSD percent recoveries and RPD data for project samples were within laboratory or data validation QC limits, were not evaluated due to sample dilution, or were not evaluated since the amount spiked was less than four times the amount of analyte measured to be in the original sample, with the following exception. **For both data sets 10166973 and 10167132, cobalt was recovered outside of laboratory QC limits of 75-125% at 153% in the matrix spike prepared from sample BP-RY-07-10 in batch MPRP/27890. As a result, detections in associated samples were qualified as J due to possible high bias.**	

VALIDATION CRITERIA CHECKLIST	
15. Was the total number of LCSs analyzed equal to at least 5% of the total number of samples, or analyzed as required by the method?	Yes
Comments: The total number of LCSs were equal to at least 5% of the total number of samples, with the exceptions of analyses for percent moisture for the Modified Sobek 3.2 analyses, and for ASA_10-3.2. Analyses of LCSs were neither prepared nor required for these methods.	
16. Were LCS/LCSD percent recoveries and LCS/LCSD RPDs within data validation or laboratory QC limits?	No
Comments: The LCS percent recoveries were within laboratory QC limits, with the following exception. **Potassium was outside of the laboratory QC limits of 80-120% at 50% in the LCS for CLP ICP AES MDEQ batch MPRP/28018 in data set 10166973, which is evidence of a high bias. Additionally, the LCS/LCSD RPD was above the QC limit of 20% at 47%. Potassium was detected in the associated sample, BP-RY-08-00, and was qualified as J due to possible high bias and low precision.**	
17. Were surrogate recoveries within laboratory QC limits?	N/A
Comments: Surrogates are not required for the reported methods.	
18. Was the number of equipment, trip, or field blanks collected compliant with the project guidelines, quality assurance project plan (QAPP), sample analysis plan (SAP), or permit?	No
Comments: Equipment, trip, and field blanks were not collected with the samples of this data set. One rinsate blank (BP-QC-WT-T1) was collected for this sampling period in data set 10163606 to evaluate possible equipment sources of contamination.	
19. Were the trip blank, field blank, and/or equipment blank samples free of analyte contamination?	No
Comments: Detections were not reported in the rinsate blank, with the following exception. Total recoverable lead was detected at 0.47 µg/L in the rinsate blank. Qualification was not required since total recoverable lead was not a target analyte for the samples reported in data sets 10166973 and 10167132.	
20. Was the number of field duplicates collected compliant with the project guidelines, QAPP, SAP, or permit?	No
Comments: Field duplicates were not submitted with the sample sets.	
21. Were field duplicate RPD values within data validation QC limits (soil 0-50%)?	N/A
Comments: Field duplicates were not submitted with the sample sets.	

VALIDATION CRITERIA CHECKLIST

22. Were laboratory duplicate RPD values within laboratory QC limits? No

Comments: Laboratory duplicates were not prepared for Methods 6020, CLP ICP AES MDEQ, or 7471A. Laboratory duplicates were prepared for the remaining sample analyses. The project samples used for the laboratory duplicate sample analyses are summarized in the table below.

Data Set	Analysis	Batch	Parent Sample
10166973	EPA 9081	ICP/15164	BP-RY-08-00
10166973	% Moisture	MPRP/28093	BP-CML-RCRA-04
10166973	ASA 33-3.2/EPA 353.2	MT/6810	BP-RY-08-00
10166973	ASA 29-3.5.2	MT/6871	BP-RY-08-00
10166973	ASA 10-3.2	MT/6804	BP-RY-08-00
10166973	Modified Sobek 3.2	MT/6867	BP-RY-08-00
10166973	Modified Sobek 3.2	MT/6870	BP-RY-08-00
10166973	ASA 10-3.3	MT/6811	BP-RY-08-00

Additionally, laboratory duplicates were prepared for percent moisture batch MPRP/28093 (data set 10166973), ASA_24-5.4 batch MT/6792 (data set 10166973), and percent moisture batch MPRP/28202 (data set 10167132) from samples not associated with this sample event.

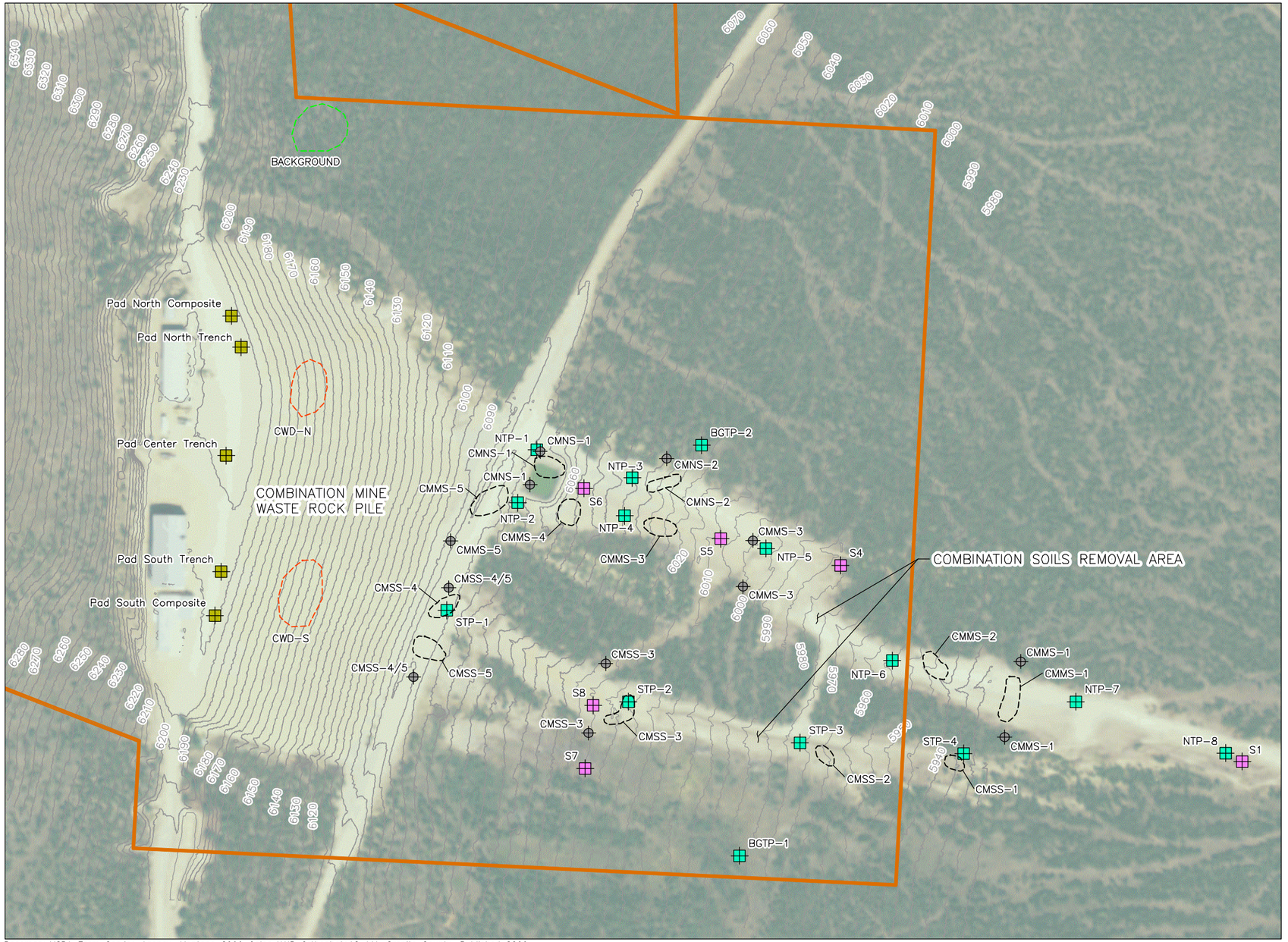
The laboratory duplicate RPD values were within laboratory QC limits, or were not applicable since one or both sample results were either non-detect or were detected at less than five times the laboratory reporting limit.

DATA QUALIFICATION SUMMARY

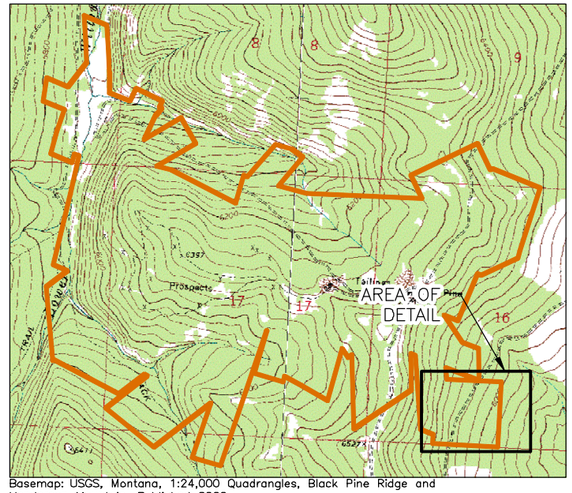
Analyte	Client Sample ID	Laboratory Assigned ID	Laboratory Result	Reviewer Qualifier	Reason for Qualification
Potassium, Total	BP-RY-08-00	10166973005	86.00 mg/kg	J	The LCS and/or LCSD recovery(ies) were above the acceptable limits indicating a possible high bias.
Cobalt, Total Recoverable	BP-CMN-SS-17	10167132001	4.2 mg/kg	J	The MS and/or MSD recovery(ies) were above the acceptable limits indicating possible matrix interference.
Cobalt, Total Recoverable	BP-CMN-SS-18	10167132002	2.9 mg/kg	J	The MS and/or MSD recovery(ies) were above the acceptable limits indicating possible matrix interference.
Cobalt, Total Recoverable	BP-CMN-SS-19	10167132003	4.1 mg/kg	J	The MS and/or MSD recovery(ies) were above the acceptable limits indicating possible matrix interference.
Cobalt, Total Recoverable	BP-CML-RCRA-01	10166973006	7.1 mg/kg	J	The MS and/or MSD recovery(ies) were above the acceptable limits indicating possible matrix interference.
Cobalt, Total Recoverable	BP-CML-RCRA-02	10166973007	0.7 mg/kg	J	The MS and/or MSD recovery(ies) were above the acceptable limits indicating possible matrix interference.
Cobalt, Total Recoverable	BP-CML-RCRA-04	10166973009	4.8 mg/kg	J	The MS and/or MSD recovery(ies) were above the acceptable limits indicating possible matrix interference.
Cobalt, Total Recoverable	BP-RY-06-00	10166973001	7.8 mg/kg	J	The MS and/or MSD recovery(ies) were above the acceptable limits indicating possible matrix interference.
Cobalt, Total Recoverable	BP-RY-06-04	10166973002	4.6 mg/kg	J	The MS and/or MSD recovery(ies) were above the acceptable limits indicating possible matrix interference.
Cobalt, Total Recoverable	BP-RY-07-00	10166973003	8.1 mg/kg	J	The MS and/or MSD recovery(ies) were above the acceptable limits indicating possible matrix interference.
Cobalt, Total Recoverable	BP-RY-07-10	10166973004	15.9 mg/kg	J	The MS and/or MSD recovery(ies) were above the acceptable limits indicating possible matrix interference.
Cobalt, Total Recoverable	BP-RY-08-00	10166973005	1.7 mg/kg	J	The MS and/or MSD recovery(ies) were above the acceptable limits indicating possible matrix interference.

APPENDIX E

HISTORICAL SAMPLE LOCATION FIGURES



Basemap: USDA Farm Service Agency, Montana 2009 Color NAIP Orthophoto12-kM, Granite County. Published 2009.



Basemap: USGS, Montana, 1:24,000 Quadrangles, Black Pine Ridge and Henderson Mountain, Published 2000.

KEY MAP
NOT TO SCALE

N

EXPLANATION

- PROPERTY BOUNDARY
- 5980 — EXISTING GROUND SURFACE CONTOURS (INTERVAL = 5')
- CMMS-1 — HYDROMETRICS 2000 SAMPLE SITE (PERIPHERAL AREA) WITH DESIGNATION
- NTP-8 — HYDROMETRICS 2001 TEST PIT WITH DESIGNATION
- Pad — HYDROMETRICS 2001 WASTE ROCK SAMPLE SITE WITH DESIGNATION
- S1 — MDEQ 2008 SAMPLE SITE WITH DESIGNATION
- HYDROMETRICS 2000 SAMPLE SITE (DEVEGETATED AREA)
- HYDROMETRICS 2000 SAMPLE SITE (WASTE ROCK)
- HYDROMETRICS 2000 SAMPLE SITE (BACKGROUND)

N

0 200'

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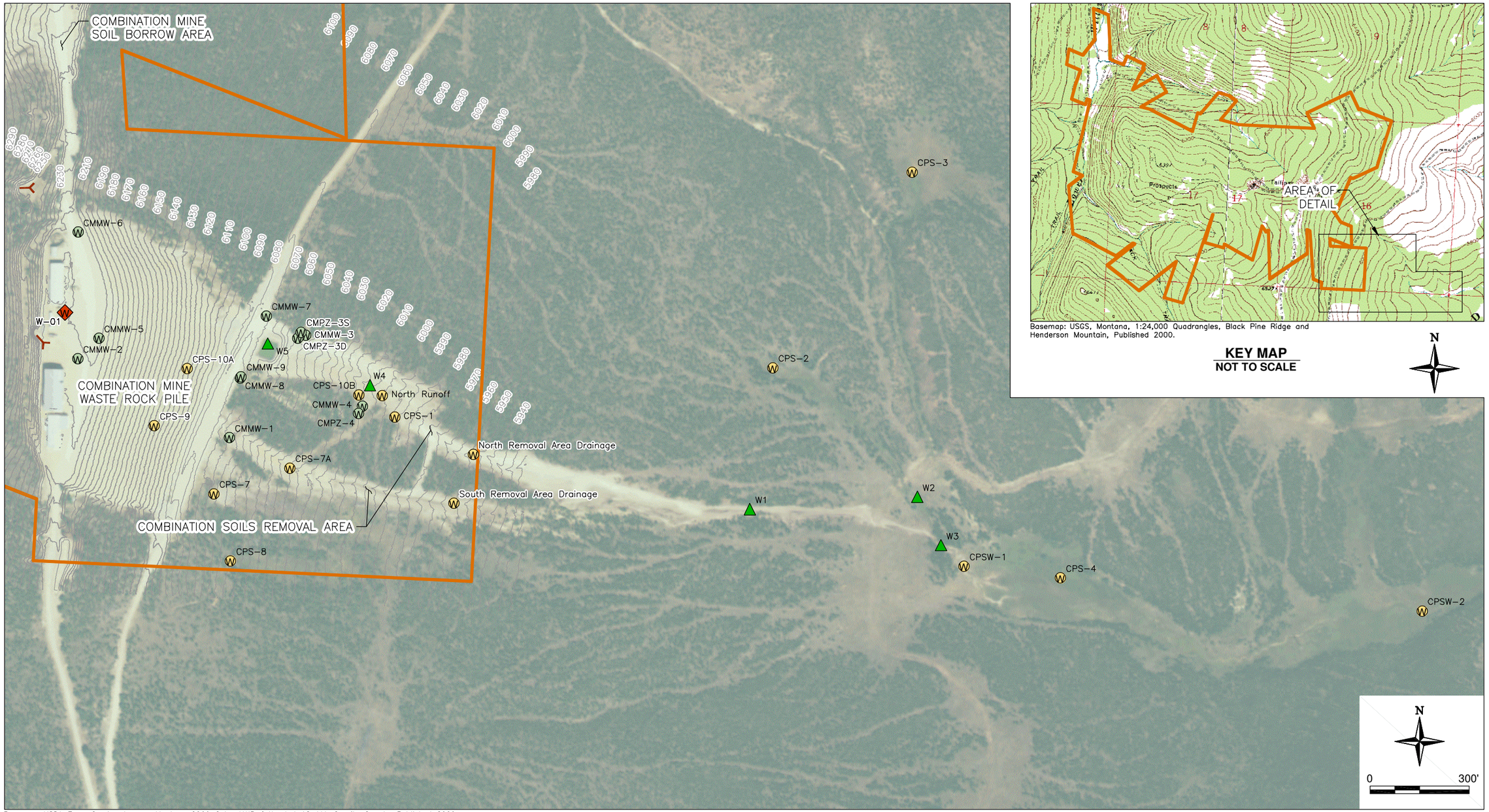
FIGURE 3-2

SOIL/SEDIMENT/MINE WASTE SAMPLING LOCATIONS, COMBINATION MINE AREA

BLACK PINE MINE RECLAMATION PROJECT
MONTANA DEQ
ABANDONED MINE SECTION

Drawn By: CJN	Checked By: AV	Scale: 1" = 200'	Date: 5/31/11	File: 24K_TOPO_3-2



Basemap: USGS, Montana, 1:24,000 Quadrangles, Black Pine Ridge and Henderson Mountain, Published 2000.

KEY MAP
NOT TO SCALE

Basemap: USDA Farm Service Agency, Montana 2009 Color NAIP Orthophoto12-kM, Granite County. Published 2009.

EXPLANATION

- PROPERTY BOUNDARY
- 5940 — EXISTING GROUND SURFACE CONTOURS (INTERVAL = 5')
- CPS-8 — ROUTINE SPRING/SEEP/SURFACE WATER MONITORING SITES (SAMPLED BY HYDROMETRICS AND OTHERS)
- W1 — JULY 2008 MDEQ INSPECTION SITES
- CMMW-1 — ROUTINE GROUNDWATER MONITORING SITES (SAMPLED BY HYDROMETRICS AND OTHERS)
- W-01 — 1981 BASELINE MONITORING SITES
- ADIT (APPROXIMATE LOCATION)

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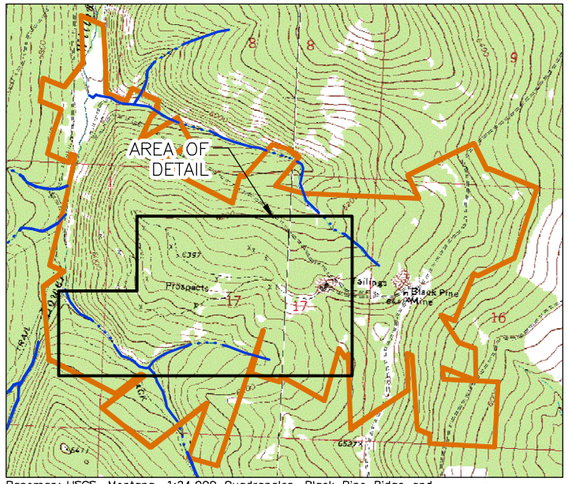
FIGURE 3-3

WATER RESOURCES MONITORING SITES, COMBINATION MINE SITE

BLACK PINE MINE RECLAMATION PROJECT
MONTANA DEQ
ABANDONED MINE SECTION

Drawn By: CJN	Checked By: AV	Scale: 1" = 300'	Date: 5/31/11	File: 24K_TOPO_3-3



Basemap: USGS, Montana, 1:24,000 Quadrangles, Black Pine Ridge and Henderson Mountain, Published 2000.

KEY MAP
NOT TO SCALE

N

TSP-6
013
TSP-5
TSP-4
TSP-3
TSP-2
TSP-1
TSP-8
TSP-9
TSP-10
TIM SMITH DRAINAGE
TIM SMITH MINE
TIM SMITH #2 ADIT
BPMSeep
BPB-8
BPB-9
BPB-10
LEWIS SHAFT
Pad West Trench
Pad West Composite
Pad East Composite
Pad East Trench

0 400'

Basemap: USDA Farm Service Agency, Montana 2009 Color NAIP Orthophoto12-kM, Granite County. Published 2009.

EXPLANATION

- PROPERTY BOUNDARY
- STREAM
- EXISTING GROUND SURFACE CONTOURS (INTERVAL = 5')
- POTENTIAL BORROW SOIL AREAS
- ROUTINE SPRING/SEEP SURFACE WATER MONITORING SITES (SAMPLED BY HYDROMETRICS AND OTHERS
- Pad — HYDROMETRICS 2001 WASTE ROCK SAMPLE SITE WITH DESIGNATION
- 013 — 1981 BASELINE MONITORING SITES
- BPMSeep — MAY 1998 MDEQ INSPECTION SITES
- BPB-8 — BORROW SOIL SAMPLE SITES
- ADIT (APPROXIMATE LOCATION)

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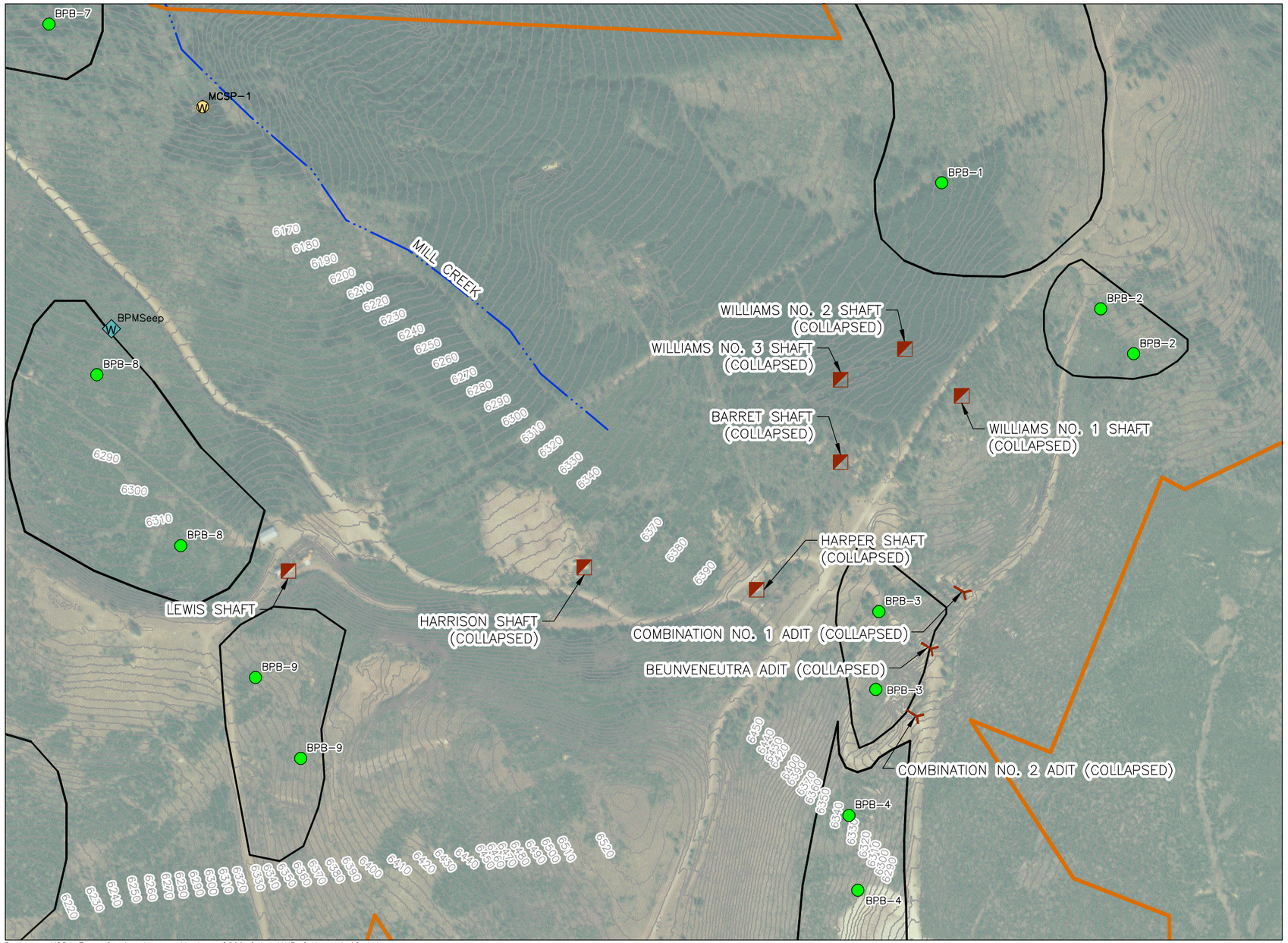
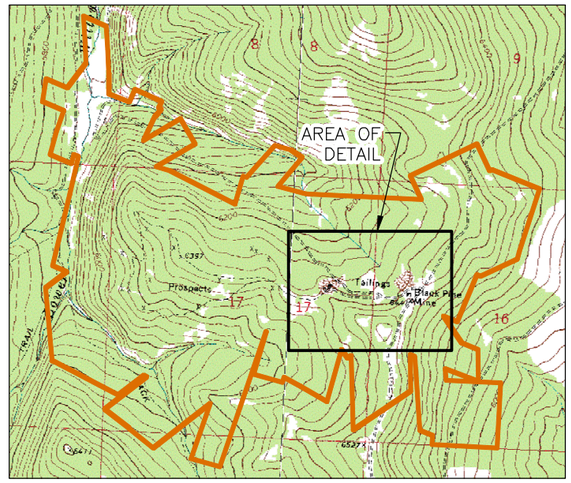
FIGURE 3-4

WATER RESOURCES MONITORING SITES AND SOIL SAMPLING LOCATIONS, TIM SMITH MINE AREA

BLACK PINE MINE RECLAMATION PROJECT
MONTANA DEQ
ABANDONED MINE SECTION

Drawn By: CJN	Checked By: AV	Scale: 1" = 400'	Date: 6/8/11	File: 24K_TOPO_3-4





KEY MAP
NOT TO SCALE

N

EXPLANATION

- PROPERTY BOUNDARY
- STREAM
- 6290 — EXISTING GROUND SURFACE CONTOURS (INTERVAL = 5')
- POTENTIAL BORROW SOIL AREAS
- MINE SHAFT (APPROXIMATE LOCATION)
- BPMSeep — MAY 1998 MDEQ INSPECTION SITE
- BPB-6 — BORROW SOIL SAMPLE SITES WITH DESIGNATION
- MCSP-1 — ROUTINE SPRING/SEEP SURFACE WATER MONITORING SITES (SAMPLED BY HYDROMETRICS AND OTHERS)
- ADIT (APPROXIMATE LOCATION)

Basemap: USDA Farm Service Agency, Montana 2009 Color NAIP Orthophoto12-kM, Granite County. Published 2009.

N

0 300'

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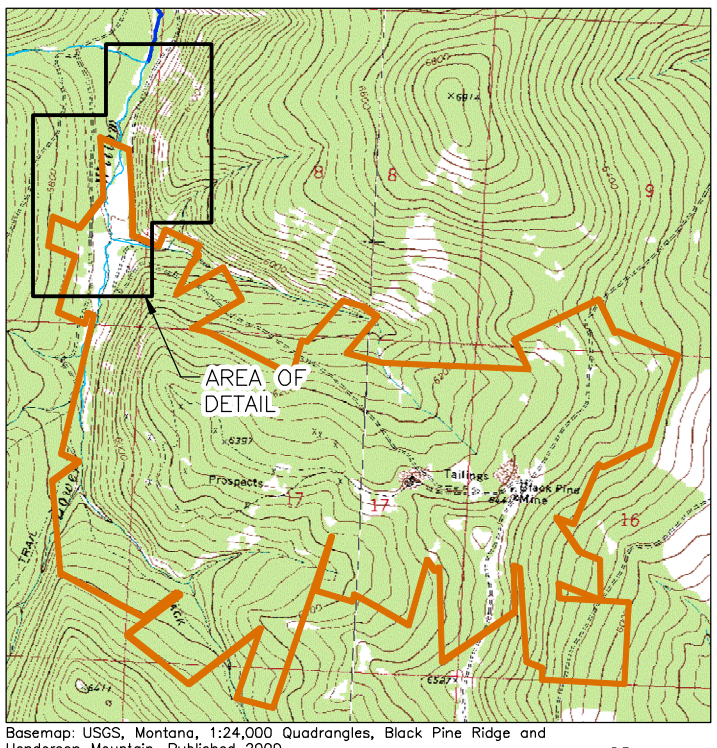
FIGURE 3-5

SAMPLING LOCATIONS, HISTORIC MINE AREA

BLACK PINE MINE RECLAMATION PROJECT
MONTANA DEQ
ABANDONED MINE SECTION

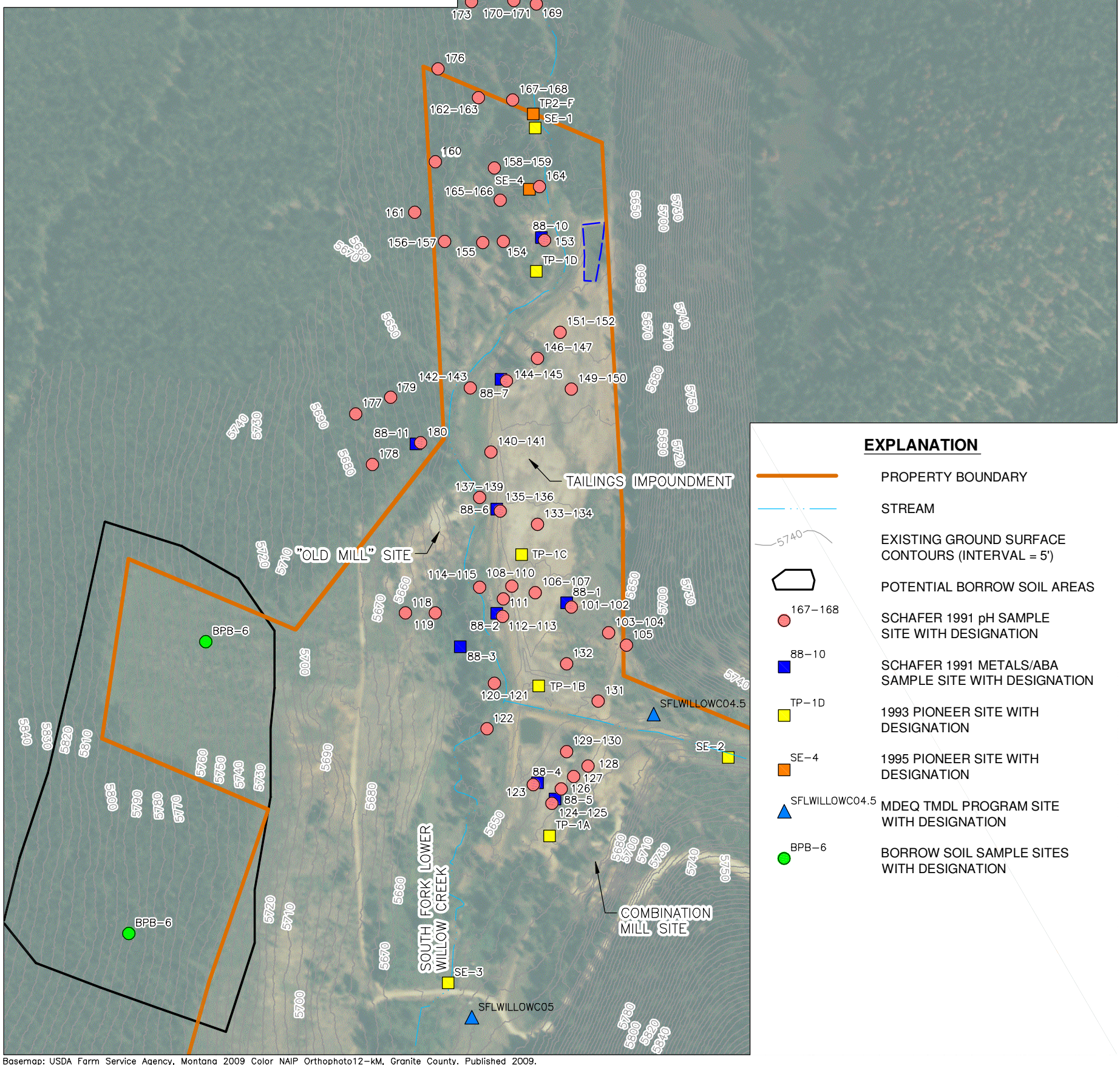
Drawn By: CJN	Checked By: AV	Scale: 1" = 300'	Date: 6/30/11	File: 24K_TOPO_3-5



Basemap: USGS, Montana, 1:24,000 Quadrangles, Black Pine Ridge and Henderson Mountain, Published 2000.

KEY MAP
NOT TO SCALE

N



EXPLANATION

- PROPERTY BOUNDARY
- STREAM
- EXISTING GROUND SURFACE CONTOURS (INTERVAL = 5')
- POTENTIAL BORROW SOIL AREAS
- 167–168 — SCHAFER 1991 pH SAMPLE SITE WITH DESIGNATION
- 88–10 — SCHAFER 1991 METALS/ABA SAMPLE SITE WITH DESIGNATION
- TP–1D — 1993 PIONEER SITE WITH DESIGNATION
- SE–4 — 1995 PIONEER SITE WITH DESIGNATION
- SFLWILLOWC04.5 — MDEQ TMDL PROGRAM SITE WITH DESIGNATION
- BPB–6 — BORROW SOIL SAMPLE SITES WITH DESIGNATION

Basemap: USDA Farm Service Agency, Montana 2009 Color NAIP Orthophoto12–kM, Granite County, Published 2009.

N

0 300'

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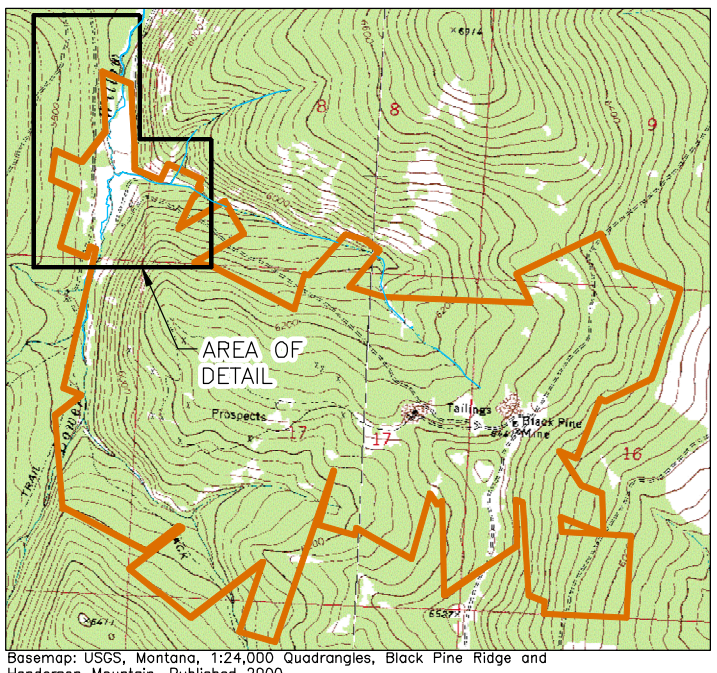
FIGURE 3-6

SOIL/SEDIMENT/MINE WASTE SAMPLING LOCATIONS, COMBINATION MILL AREA

BLACK PINE MINE RECLAMATION PROJECT
MONTANA DEQ
ABANDONED MINE SECTION

Drawn By: CJN	Checked By: AV	Scale: 1" = 300'	Date: 6/2/11	File: 24K_TOPO_3-6



Basemap: USGS, Montana, 1:24,000 Quadrangles, Black Pine Ridge and Henderson Mountain, Published 2000.

KEY MAP
NOT TO SCALE

N

EXPLANATION

- PROPERTY BOUNDARY
- STREAM
- 5660 — EXISTING GROUND SURFACE CONTOURS (INTERVAL = 5')
- MCSW–1 — ROUTINE SPRING/SEEP SURFACE WATER MONITORING SITES (SAMPLED BY HYDROMETRICS AND OTHERS
- 012 — 1981 BASELINE MONITORING SITES
- 2B — 1991 SCHAFER AND ASSOCIATES SITES
- SW–B — 1993 PIONEER SITES
- SW–4 — 1995 PIONEER SITES
- SFLWILLOWC04.5 — MDEQ TMDL PROGRAM SITES

SFLWILLOWC04
SW–1
SW–4
1B
2B
SW–A
SW–B
SW–C
"OLD MILL" SITE
TAILINGS IMPOUNDMENT
SW–D
SFLWILLOWC04.5
012
2A
MCSW–1
SW–2
MILL CREEK
TP–1A
022
COMBINATION MILL SITE
SW–3
WCSW–1
1A
SFLWILLOWC05
SOUTH FORK LOWER WILLOW CREEK

Basemap: USDA Farm Service Agency, Montana 2009 Color NAIP Orthophoto12–kM, Granite County. Published 2009.

N

0 300'

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FIGURE 3-7

WATER RESOURCE MONITORING SITES, COMBINATION MILL AREA

BLACK PINE MINE RECLAMATION PROJECT
MONTANA DEQ
ABANDONED MINE SECTION

Drawn By: CJN	Checked By: AV	Scale: 1" = 300'	Date: 5/31/11	File: 24K_TOPO_3-7

APPENDIX F

TREND GRAPHS

F1 COMBINATION MINE AOC SURFACE WATER TREND GRAPHS
F2 COMBINATION MINE AOC GROUNDWATER TREND GRAPHS
F3 COMBINATION MINE AOC GROUNDWATER FLUID LEVEL TREND GRAPHS
F4 TIM SMITH MINE AOC SURFACE WATER TREND GRAPH
F5 HISTORIC MINE AOC SURFACE WATER TREND GRAPH

APPENDIX F1

COMBINATION MINE AOC SURFACE WATER TREND GRAPHS

FIGURE F-1. CPS-1 COPPER, MANGANESE, AND ZINC CONCENTRATIONS OVER TIME
COMBINATION MINE AOC
BLACK PINE MINE

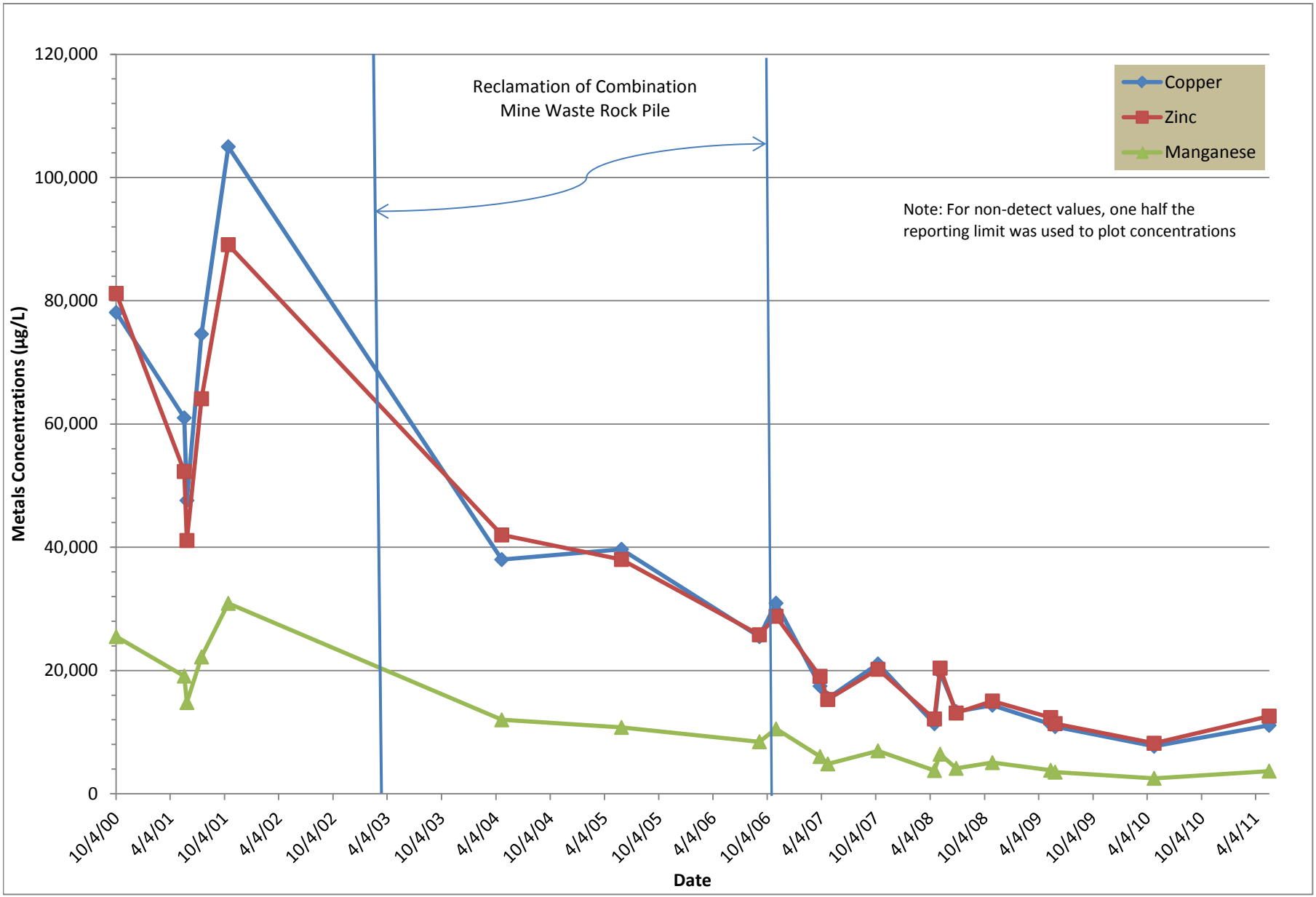


FIGURE F-2. CPS-1 CADMIUM, IRON, AND LEAD CONCENTRATIONS OVER TIME
COMBINATION MINE AOC
BLACK PINE MINE

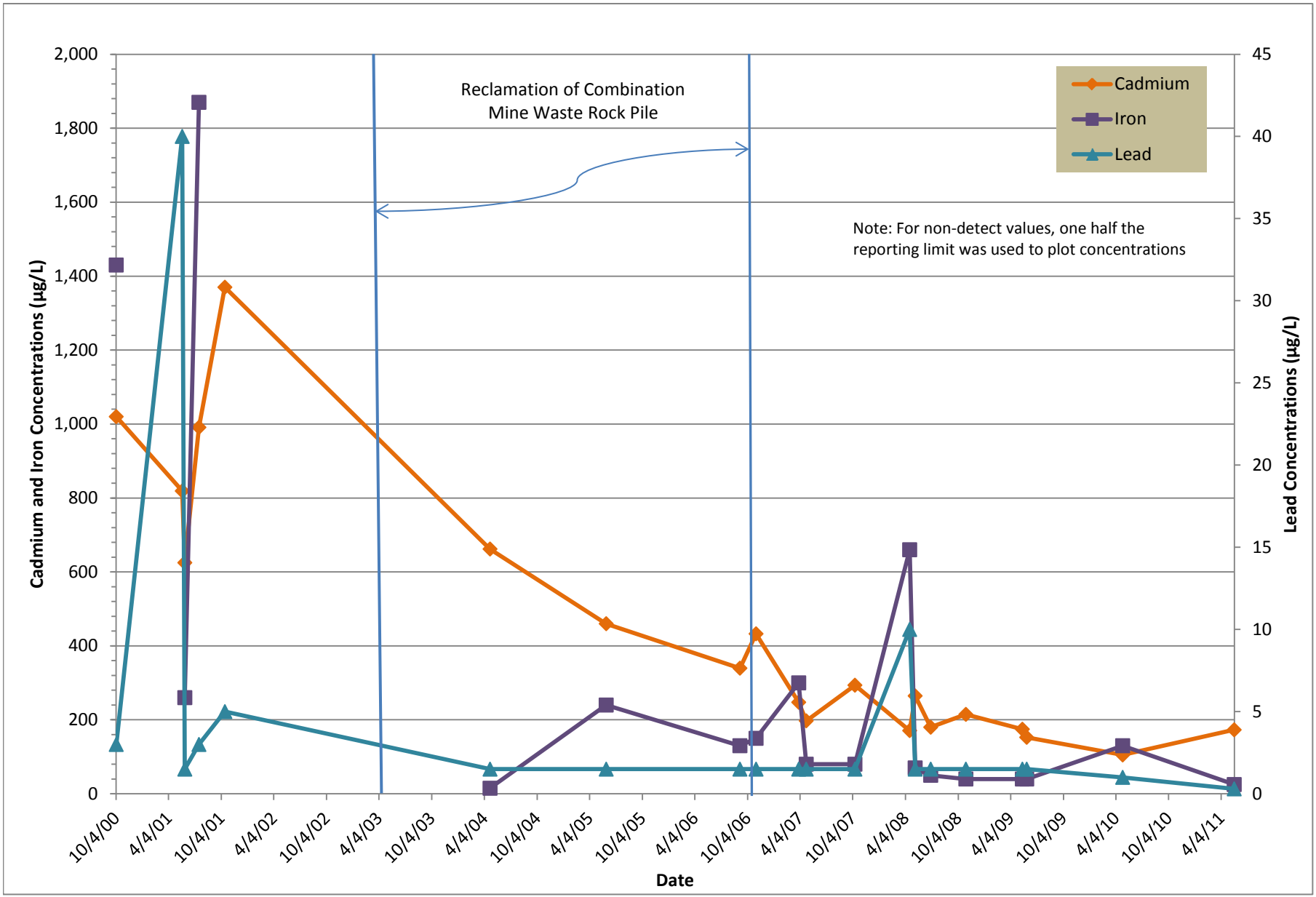


FIGURE F-3. ARSENIC CONCENTRATIONS OVER TIME IN SEEP SAMPLES: CPS-7A, NRAD, SRAD, AND CPS-10A/DTRD
COMBINATION MINE AOC
BLACK PINE MINE

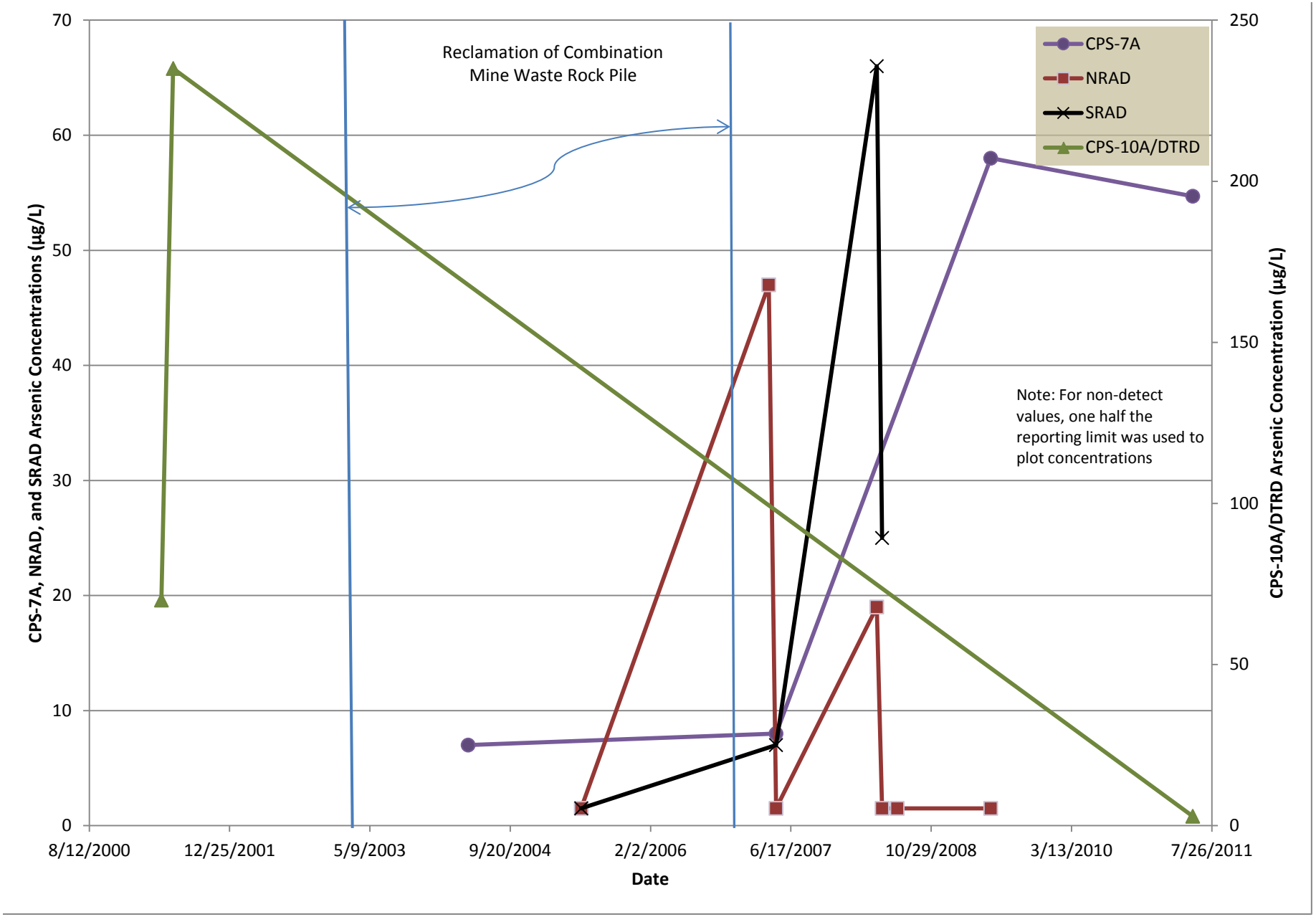


FIGURE F-4. CADMIUM CONCENTRATIONS OVER TIME IN SEEP SAMPLES: CPS-7A, NRAD, NORTH DRAINAGE RUNOFF, CPS-1 CPS-10A/DTRD, CPS-10B
COMBINATION MINE AOC
BLACK PINE MINE

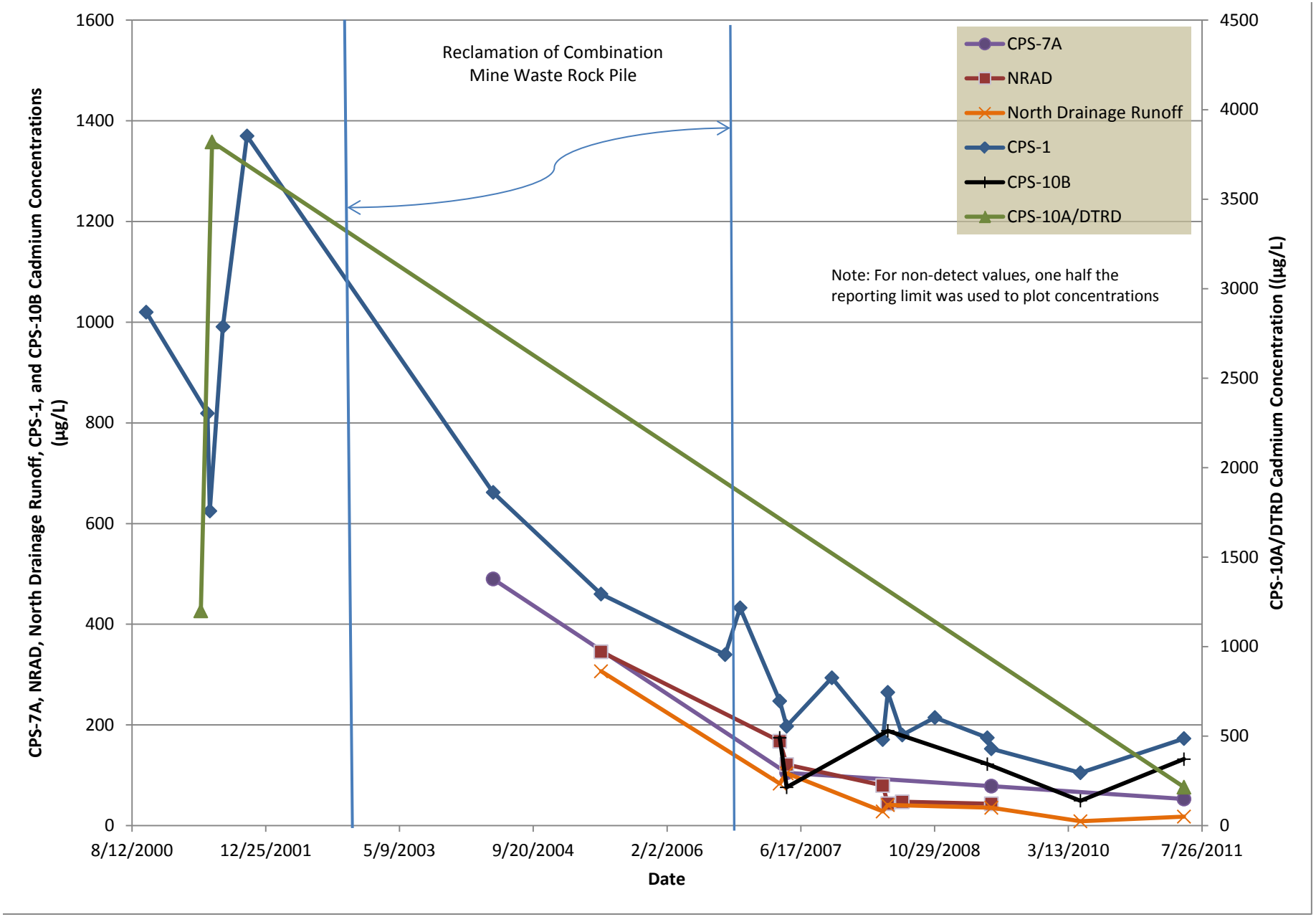


FIGURE F-5. COPPER CONCENTRATIONS OVER TIME IN SEEP SAMPLES: CPS-7A, NRAD, NORTH DRAINAGE RUNOFF, CPS-1, CPS-10A/DTRD CPS-10B, CPS-7
COMBINATION MINE AOC
BLACK PINE MINE

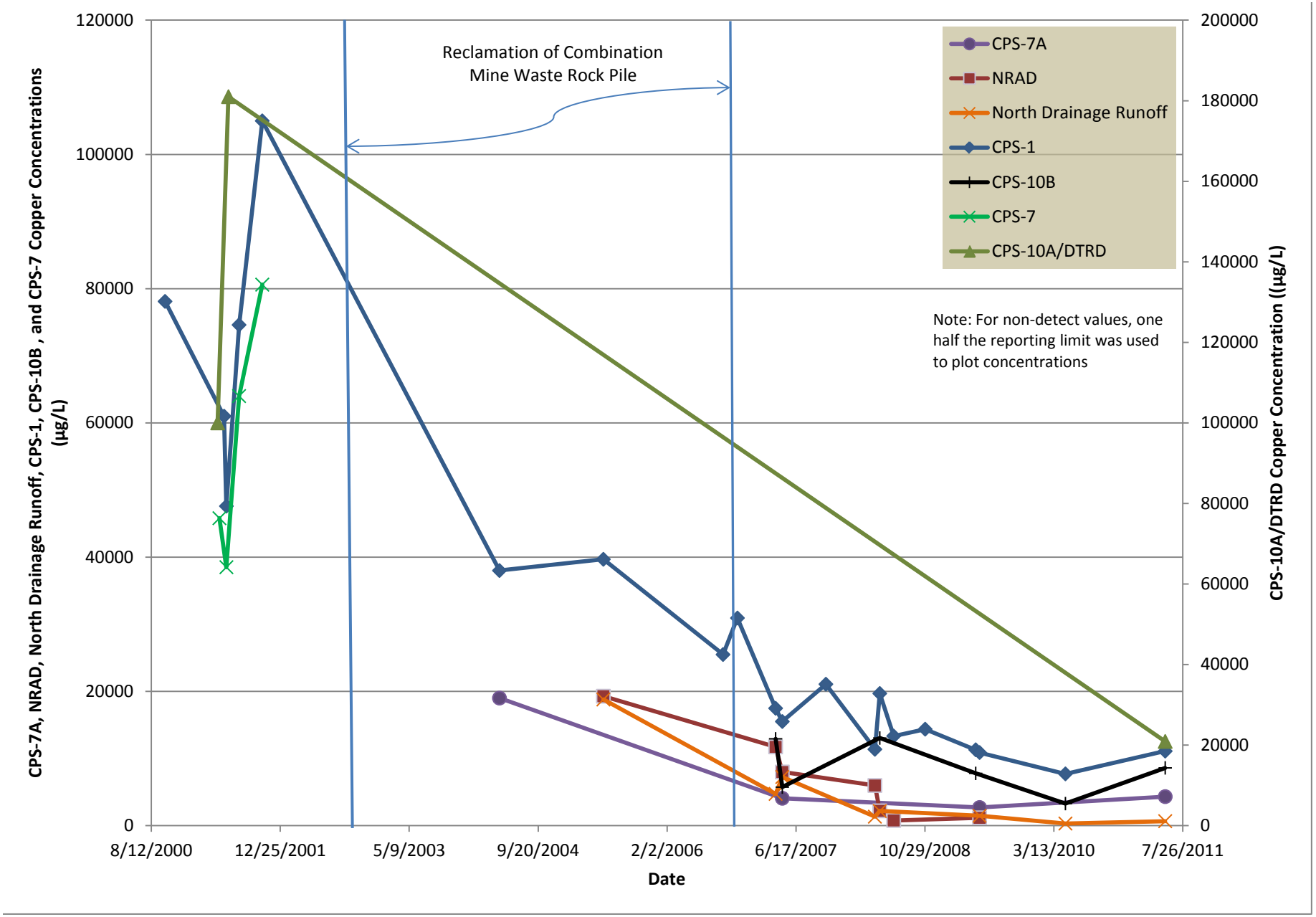


FIGURE F-6. IRON CONCENTRATIONS OVER TIME IN SEEP SAMPLES: CPS-7A, NRAD, NORTH DRAINAGE RUNOFF, SRAD, AND CPS-10A/DTRD
COMBINATION MINE AOC
BLACK PINE MINE

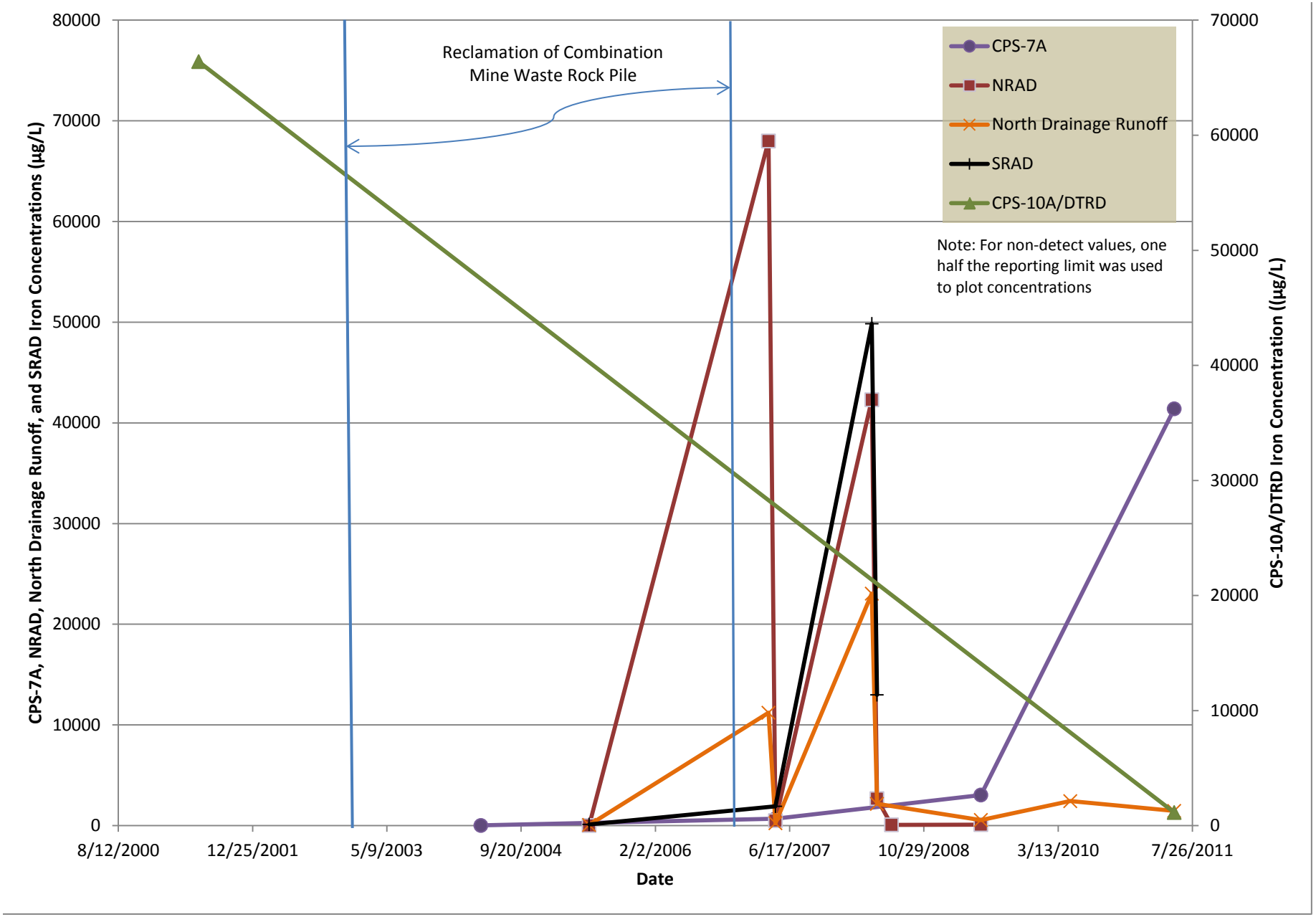


FIGURE F-7. LEAD CONCENTRATIONS OVER TIME IN SEEP SAMPLES: CPS-7A, NRAD, SRAD, AND CPS-10A/DTRD
COMBINATION MINE AOC
BLACK PINE MINE

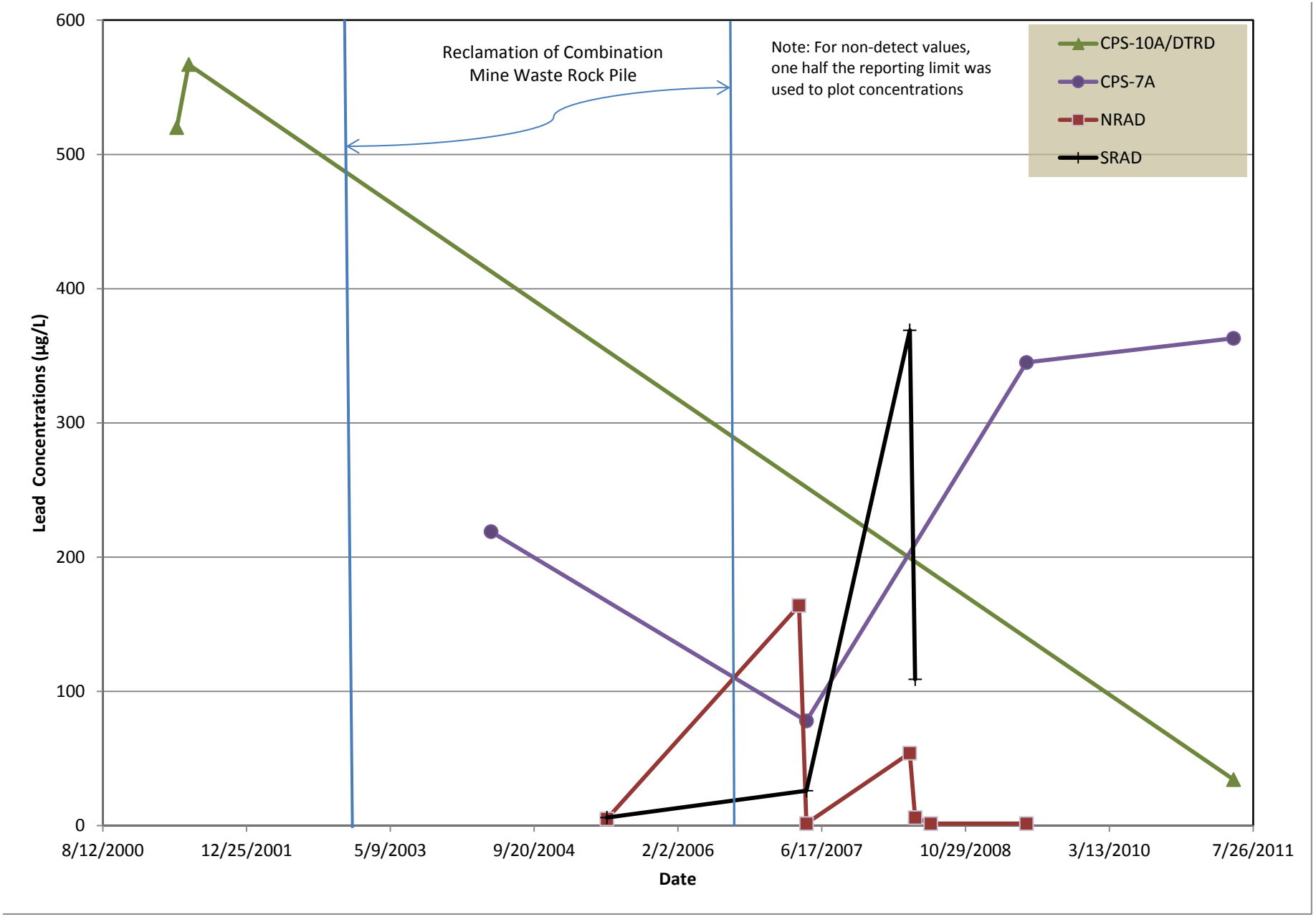


FIGURE F-8. MANGANESE CONCENTRATIONS OVER TIME IN SEEP SAMPLES: CPS-7A, NRAD, NORTH DRAINAGE RUNOFF, CPS-10B, CPSW-2 CPS-10A/DTRD, CPS-1, AND CPS-7
COMBINATION MINE AOC
BLACK PINE MINE

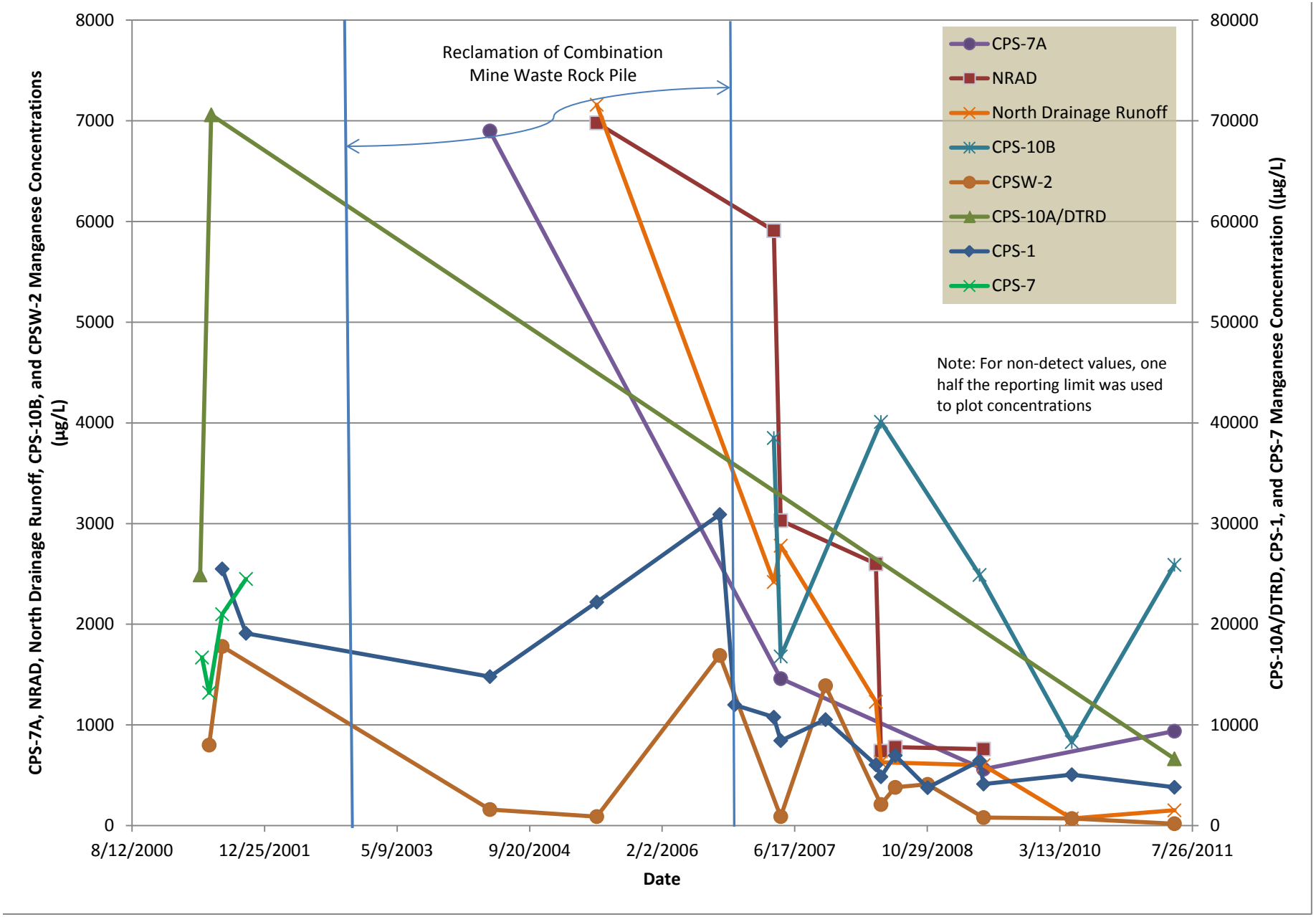
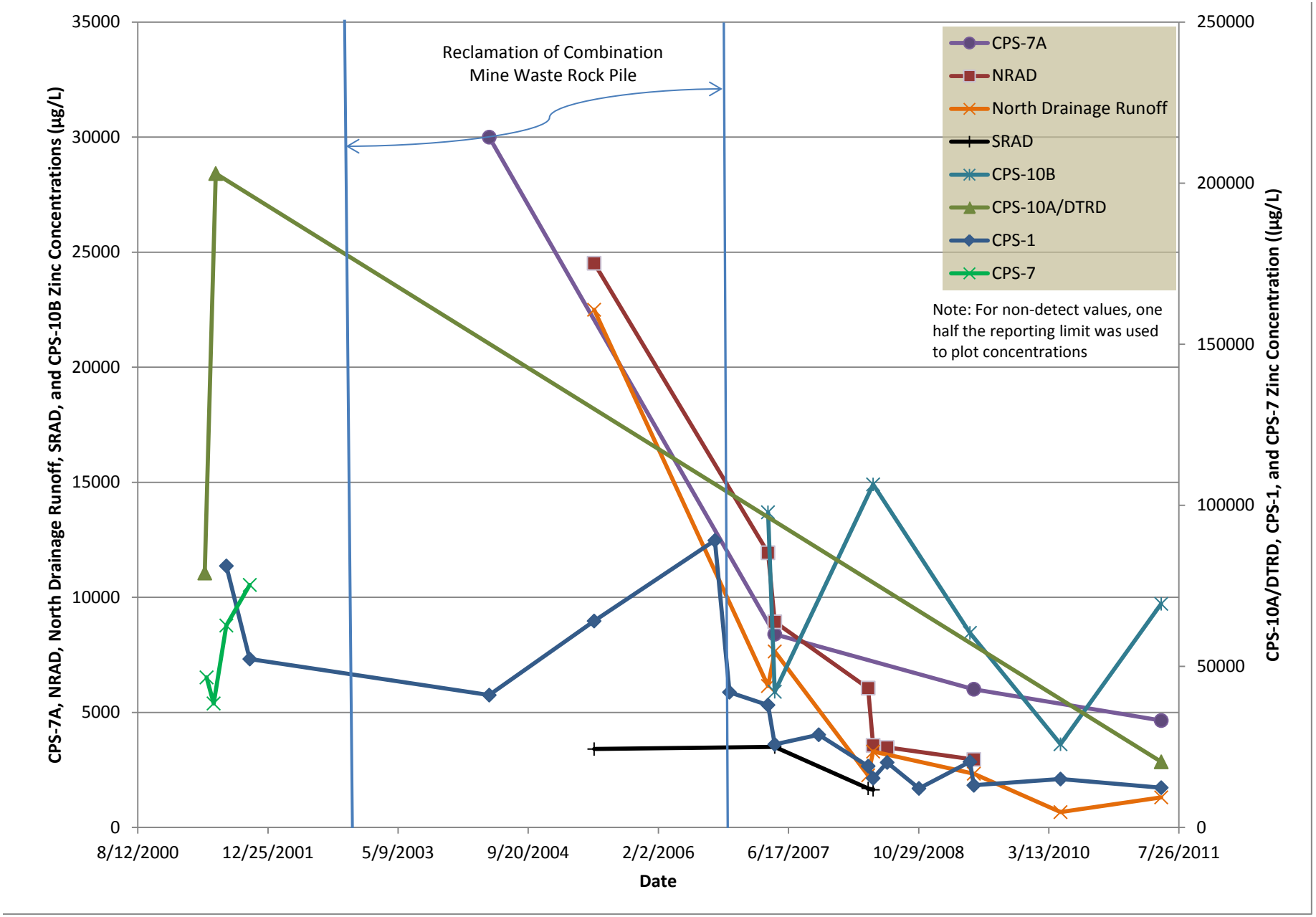


FIGURE F-9. ZINC CONCENTRATIONS OVER TIME IN SEEP SAMPLES: CPS-7A, NRAD, NORTH DRAINAGE RUNOFF, SRAD, CPS-10B CPS-10A/DTRD, CPS-1, AND CPS-7
COMBINATION MINE AOC
BLACK PINE MINE



APPENDIX F2

COMBINATION MINE AOC GROUNDWATER TREND GRAPHS

FIGURE F-10. ARSENIC CONCENTRATIONS OVER TIME IN GROUNDWATER SAMPLES
COMBINATION MINE AOC
BLACK PINE MINE

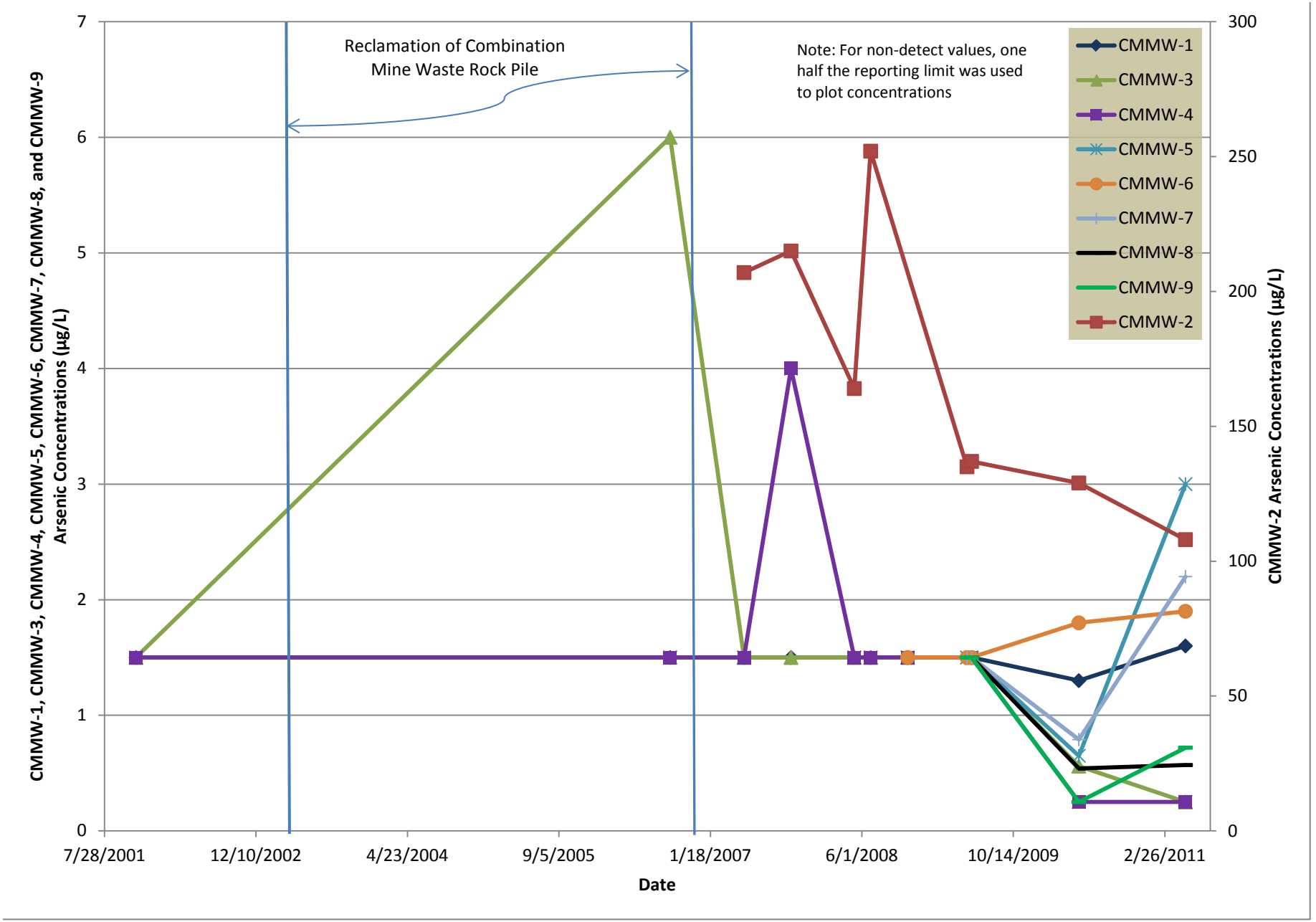


FIGURE F-11. CADMIUM CONCENTRATIONS OVER TIME IN GROUNDWATER SAMPLES
COMBINATION MINE AOC
BLACK PINE MINE

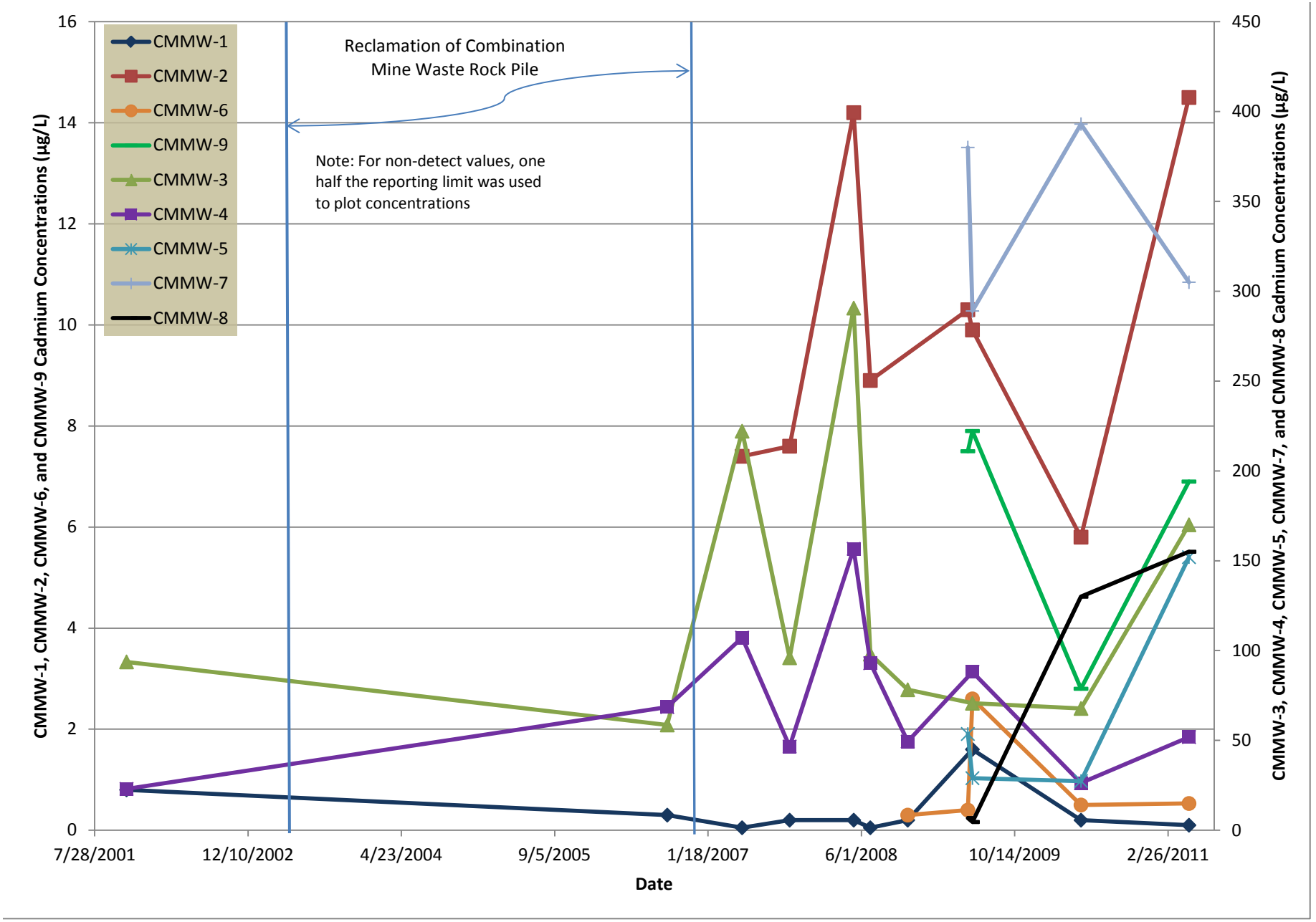


FIGURE F-12. COPPER CONCENTRATIONS OVER TIME IN GROUNDWATER SAMPLES
COMBINATION MINE AOC
BLACK PINE MINE

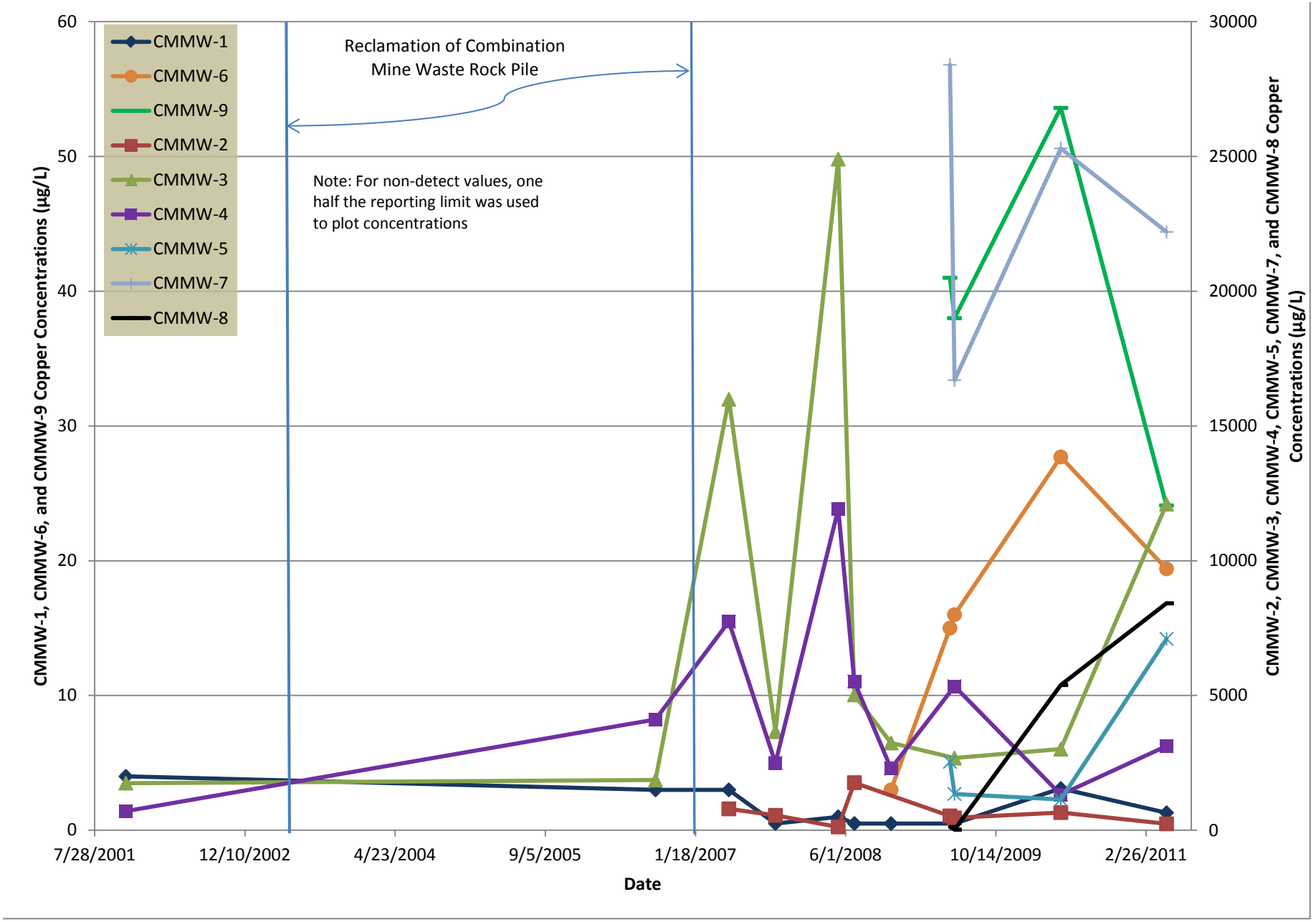


FIGURE F-13. IRON CONCENTRATIONS OVER TIME IN GROUNDWATER SAMPLES
COMBINATION MINE AOC
BLACK PINE MINE

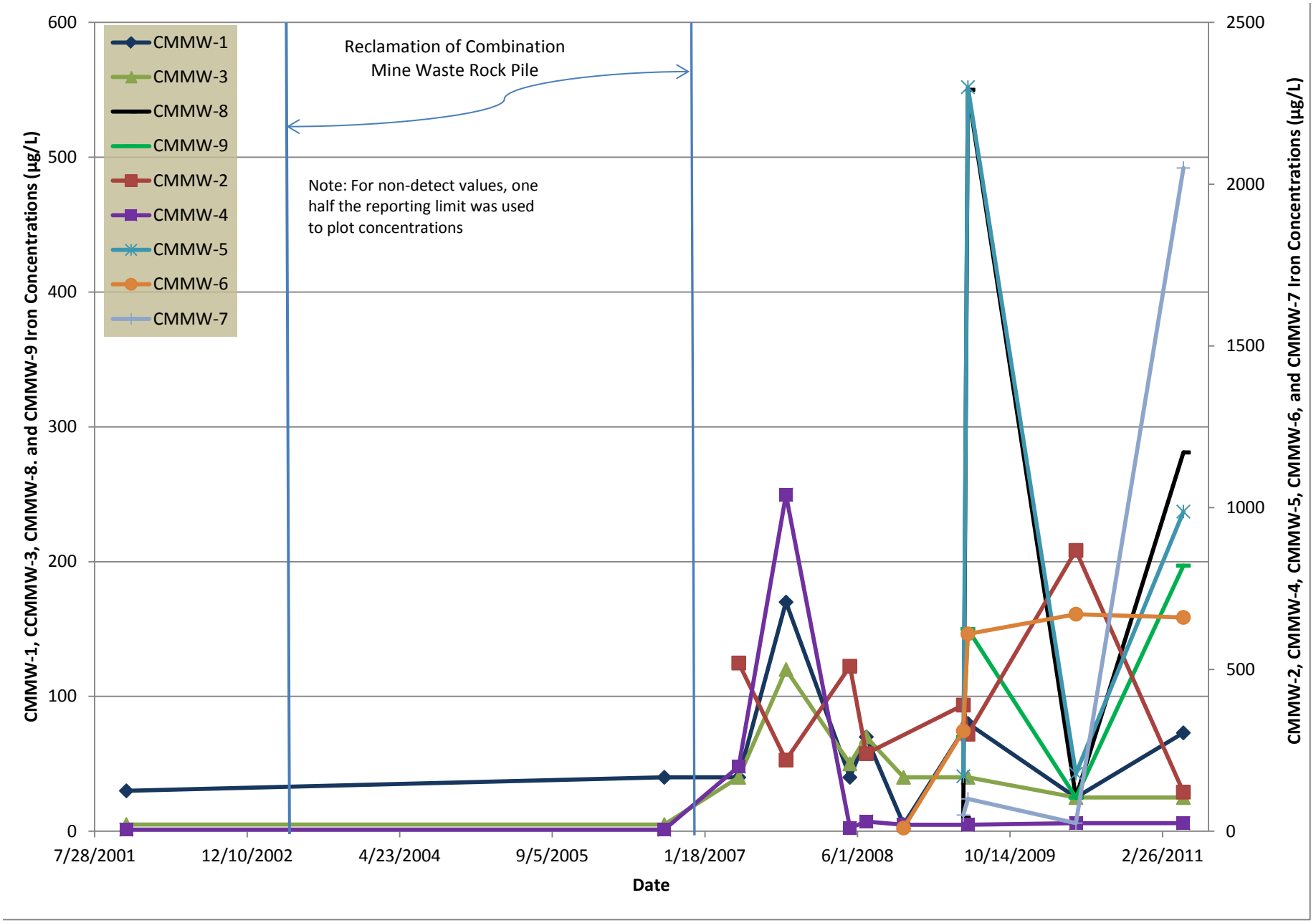


FIGURE F-14. LEAD CONCENTRATIONS OVER TIME IN GROUNDWATER SAMPLES
COMBINATION MINE AOC
BLACK PINE MINE

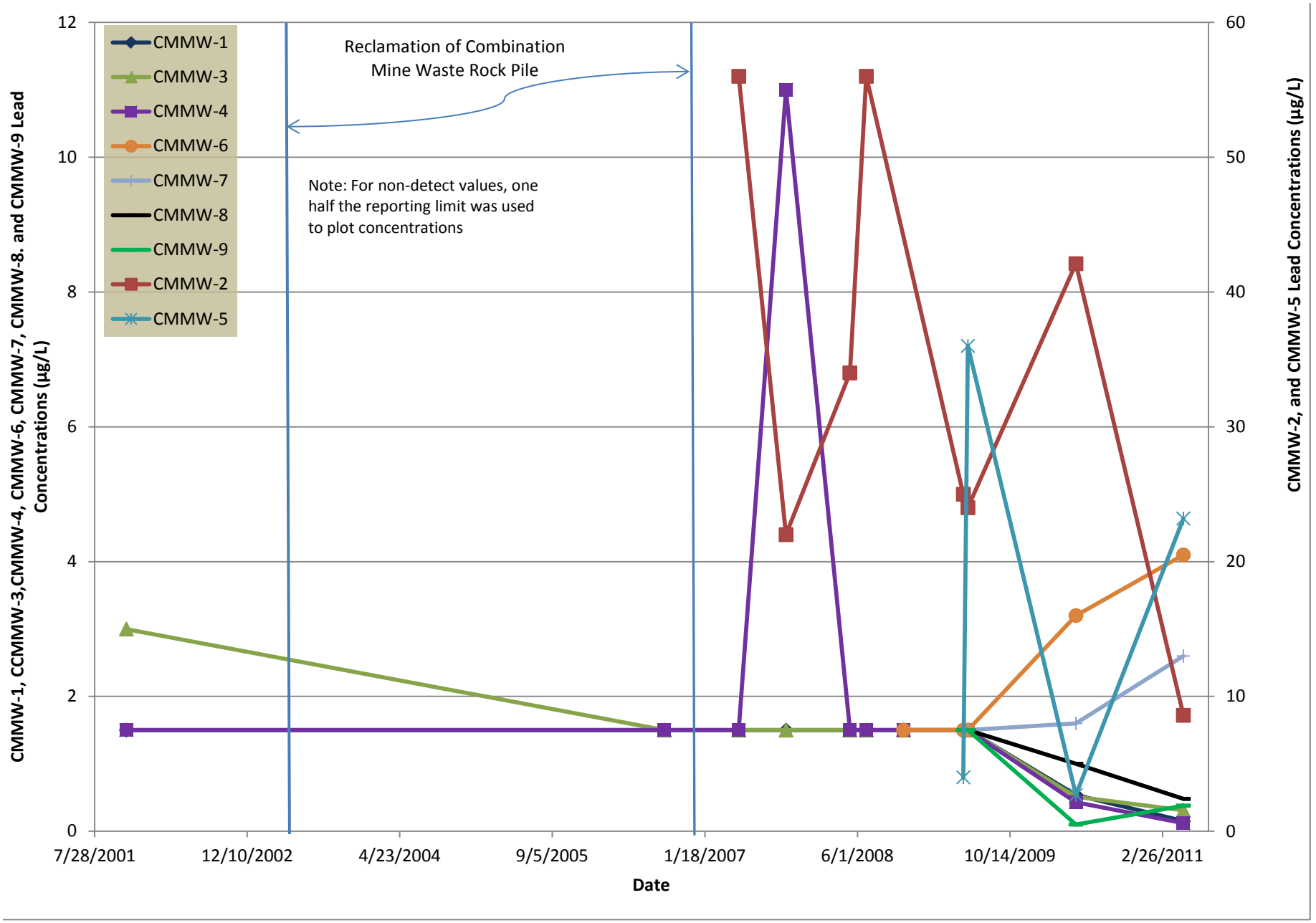


FIGURE F-15. MANGANESE CONCENTRATIONS OVER TIME IN GROUNDWATER SAMPLES
COMBINATION MINE AOC
BLACK PINE MINE

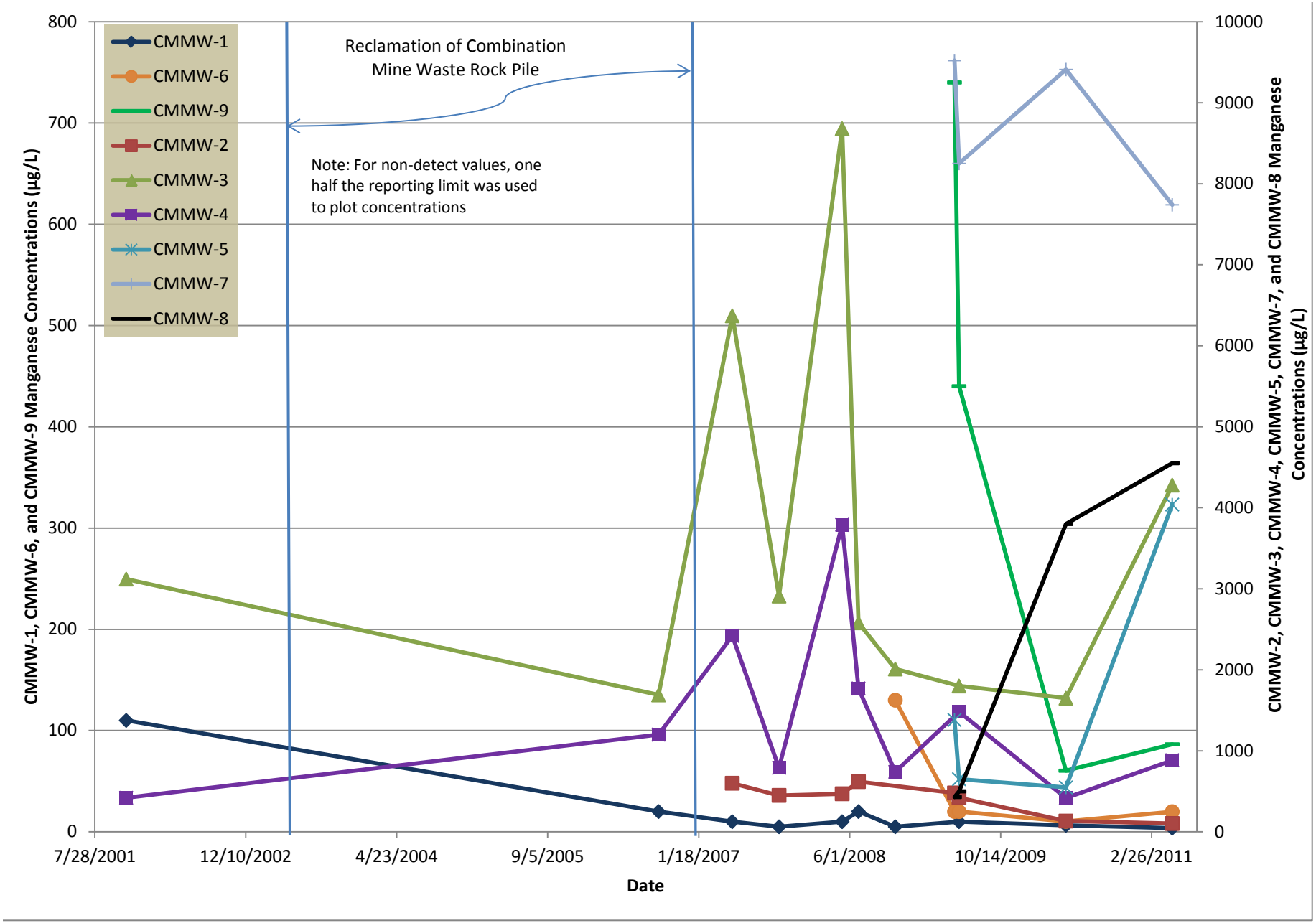
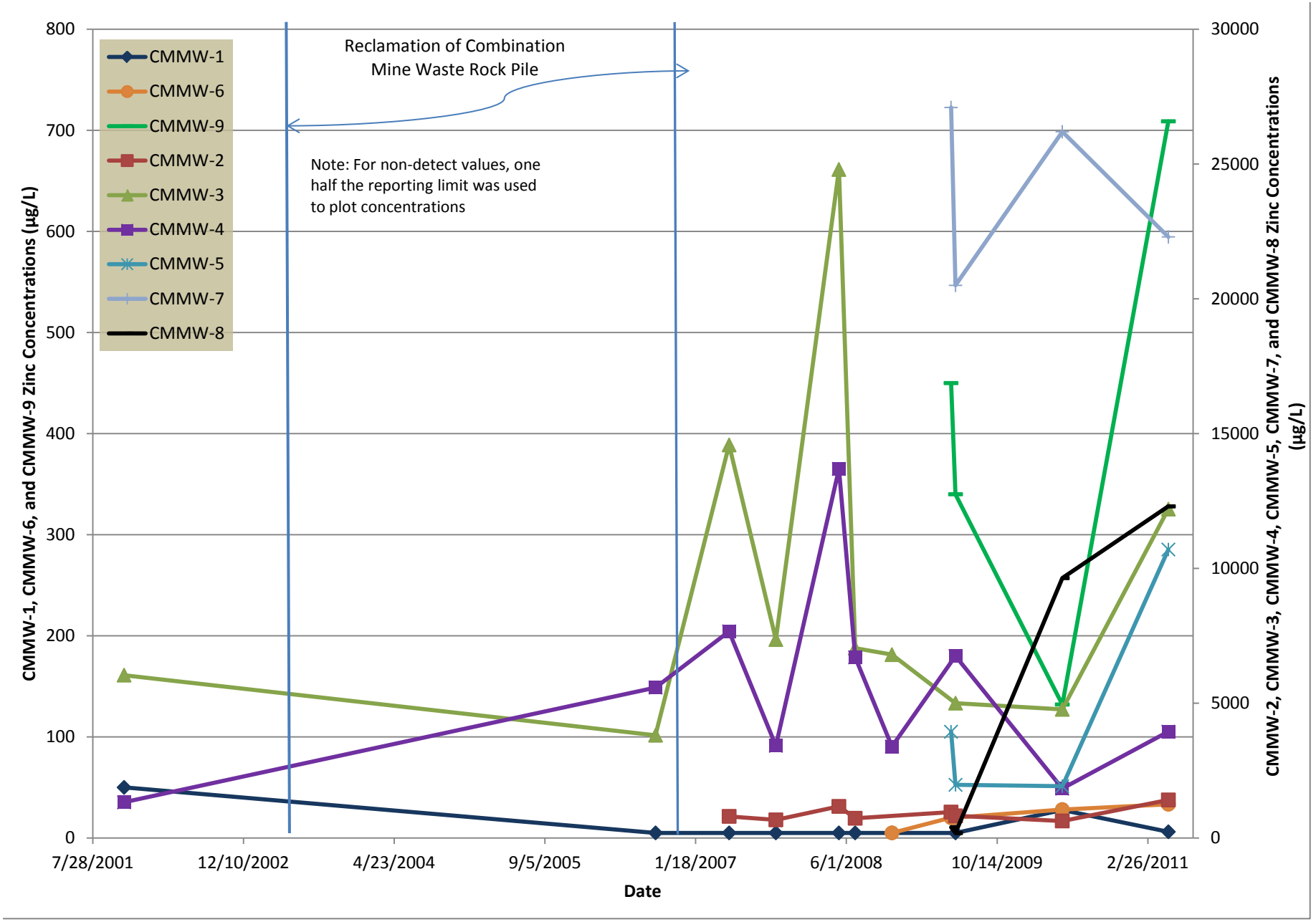


FIGURE F-16. ZINC CONCENTRATIONS OVER TIME IN GROUNDWATER SAMPLES
COMBINATION MINE AOC
BLACK PINE MINE



APPENDIX F3

COMBINATION MINE AOC GROUNDWATER FLUID LEVEL TREND GRAPHS

FIGURE F-17. CMMW-1 GROUNDWATER ELEVATIONS
COMBINATION MINE AOC
BLACK PINE MINE

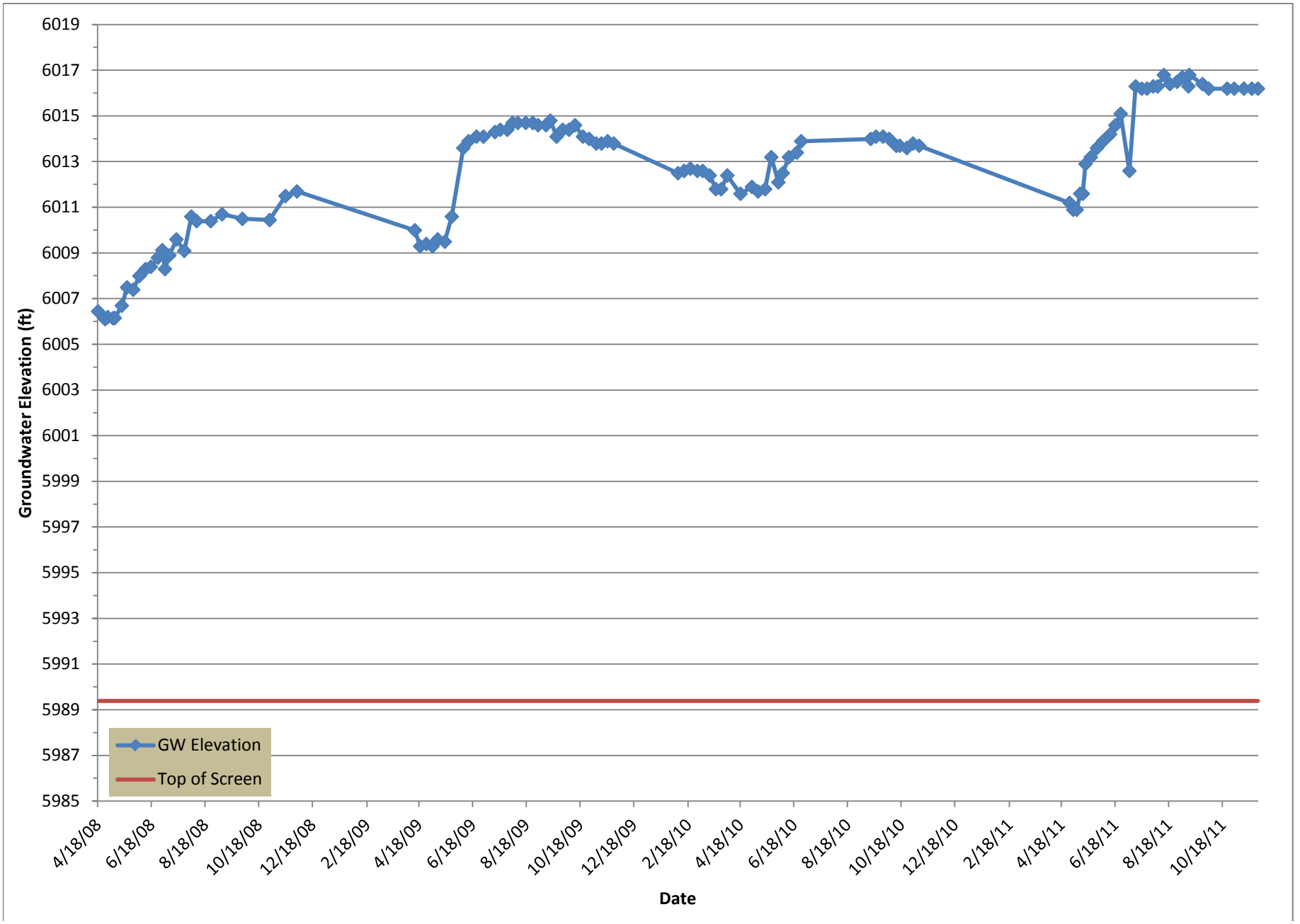


FIGURE F-18. CMMW-2 GROUNDWATER ELEVATIONS
COMBINATION MINE AOC
BLACK PINE MINE

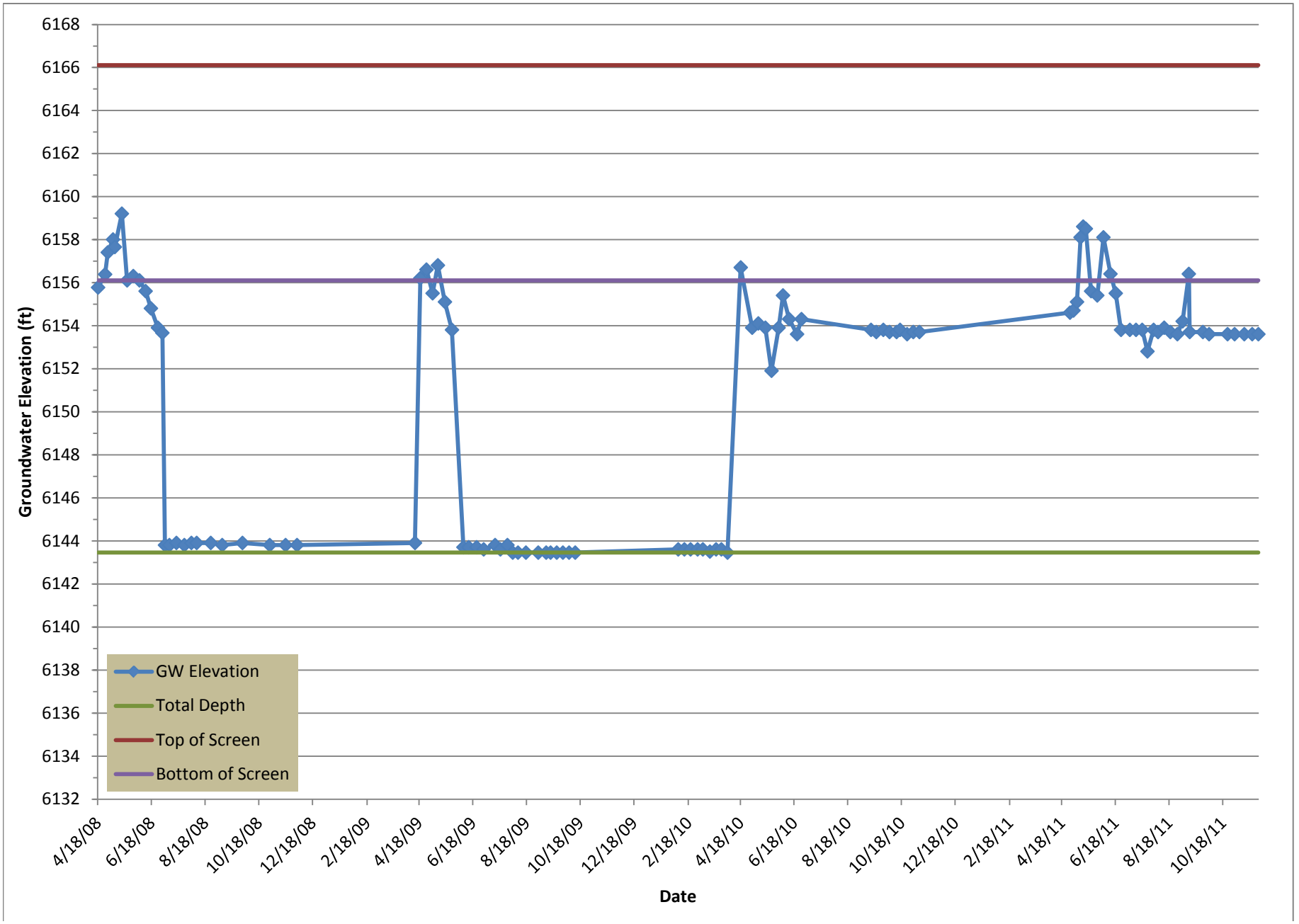


FIGURE F-19. CMMW-3 GROUNDWATER ELEVATIONS
COMBINATION MINE AOC
BLACK PINE MINE

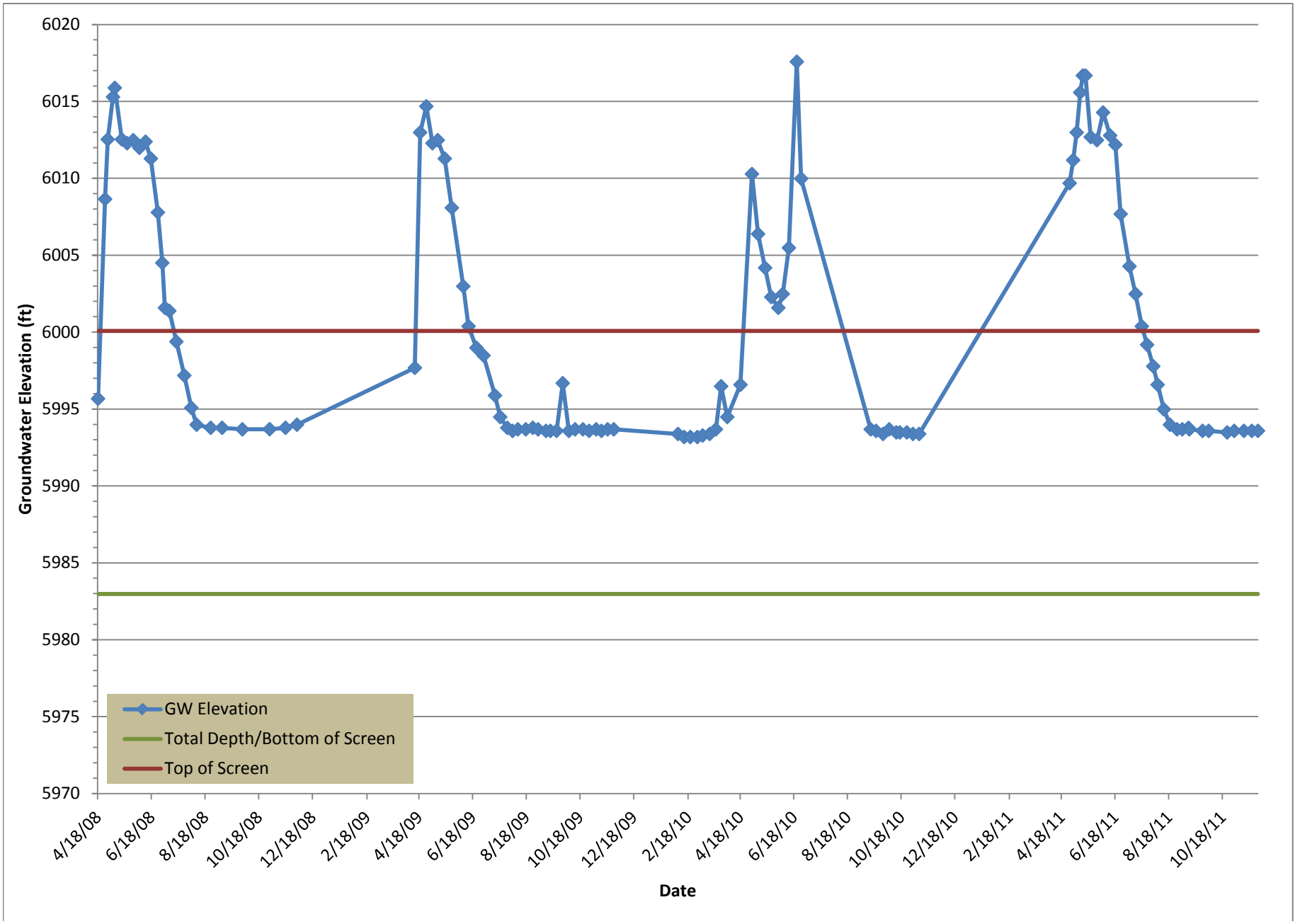


FIGURE F-20. CMMW-4 GROUNDWATER ELEVATIONS
COMBINATION MINE AOC
BLACK PINE MINE

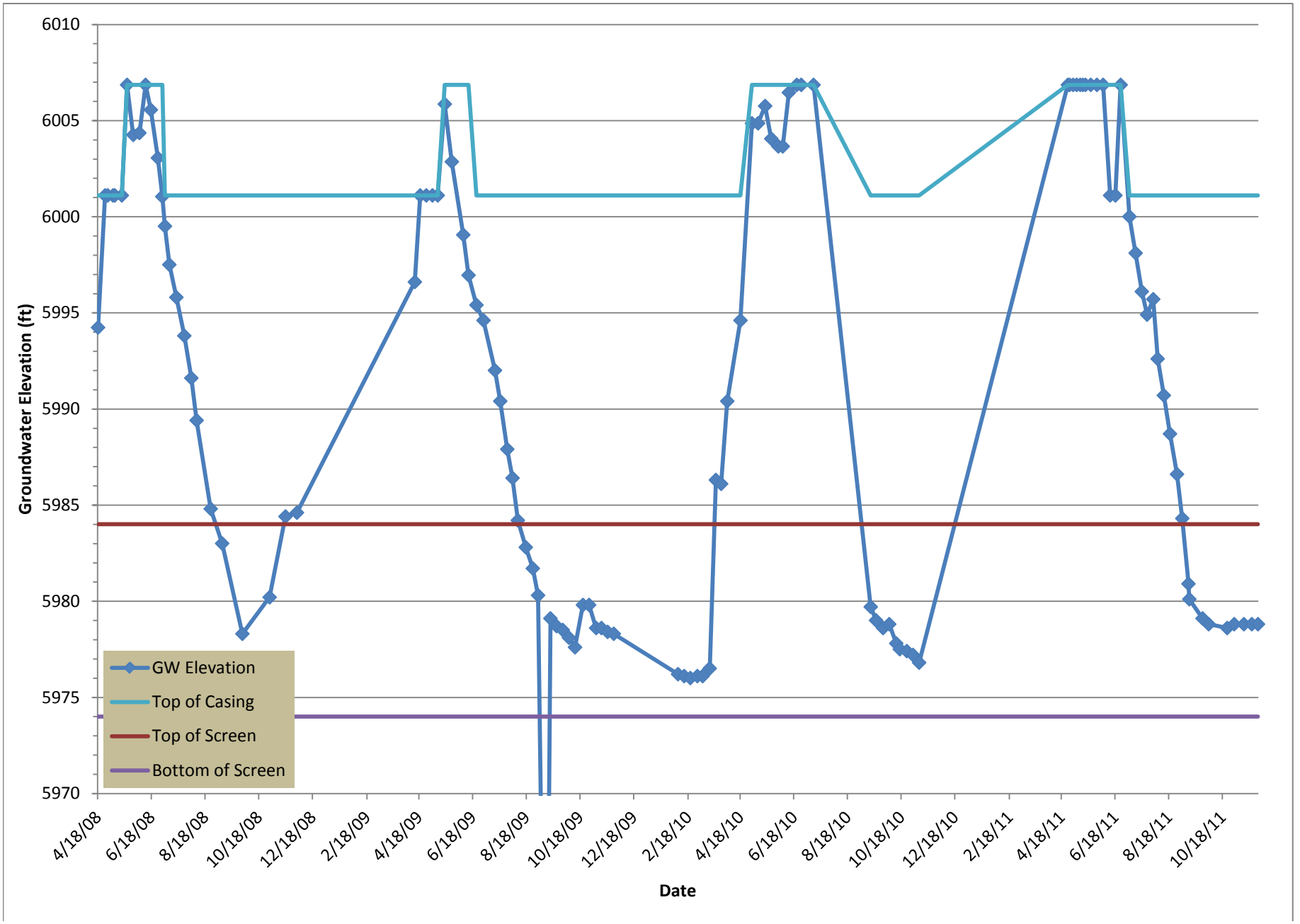


FIGURE F-21. CMMW-5 GROUNDWATER ELEVATIONS
COMBINATION MINE AOC
BLACK PINE MINE

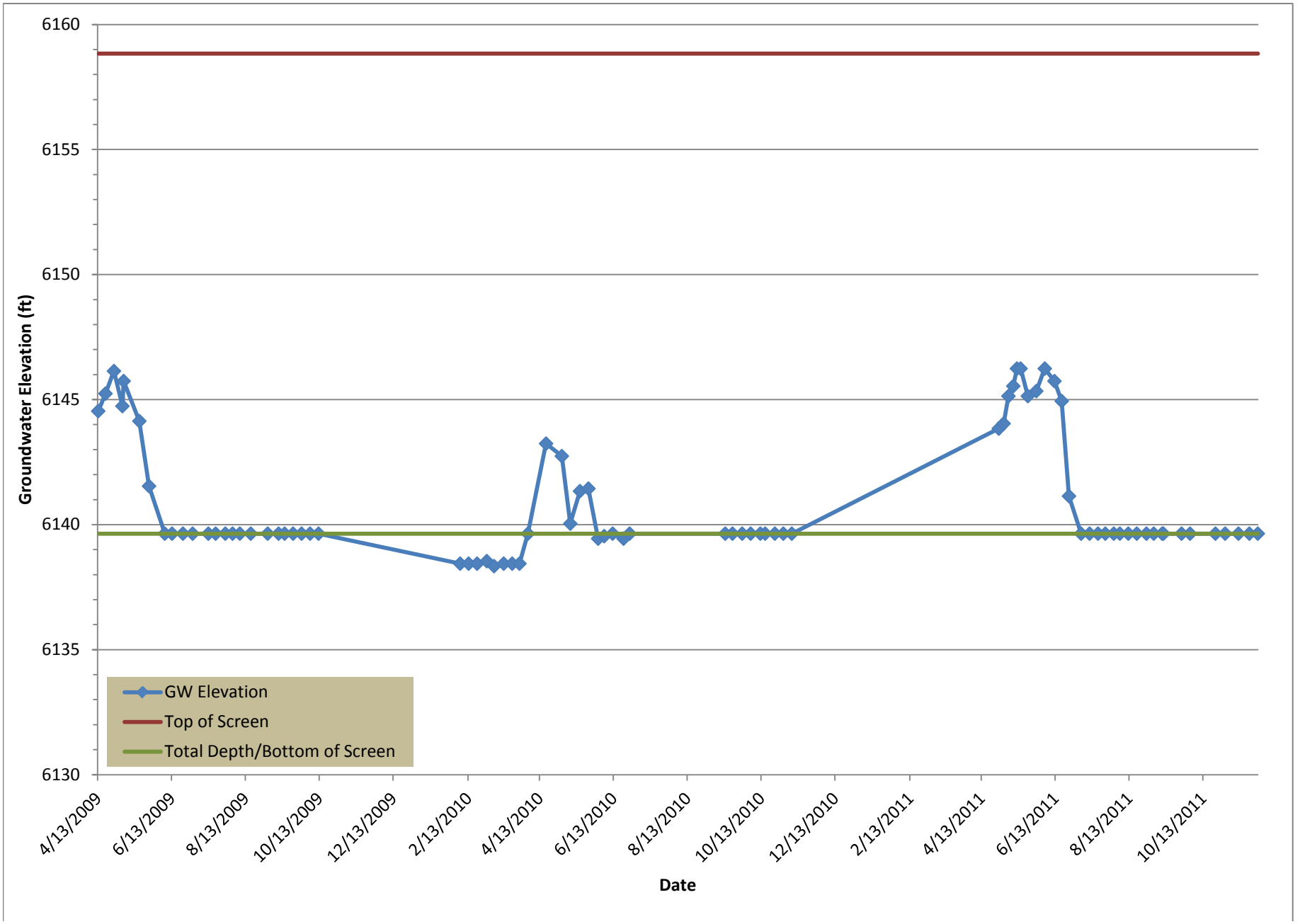


FIGURE F-22. CMMW-6 GROUNDWATER ELEVATIONS
COMBINATION MINE AOC
BLACK PINE MINE

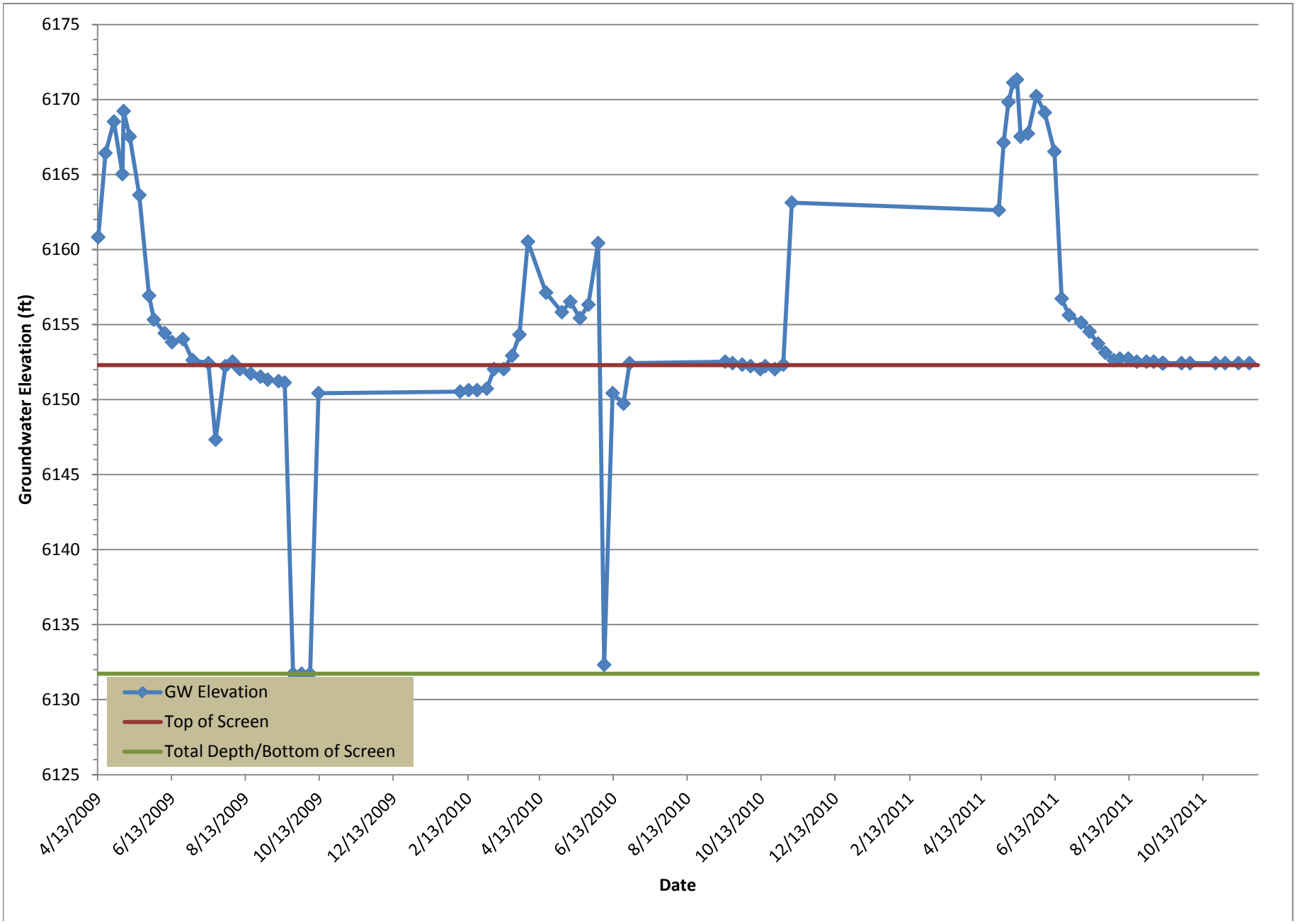


FIGURE F-23. CMMW-7 GROUNDWATER ELEVATIONS
COMBINATION MINE AOC
BLACK PINE MINE

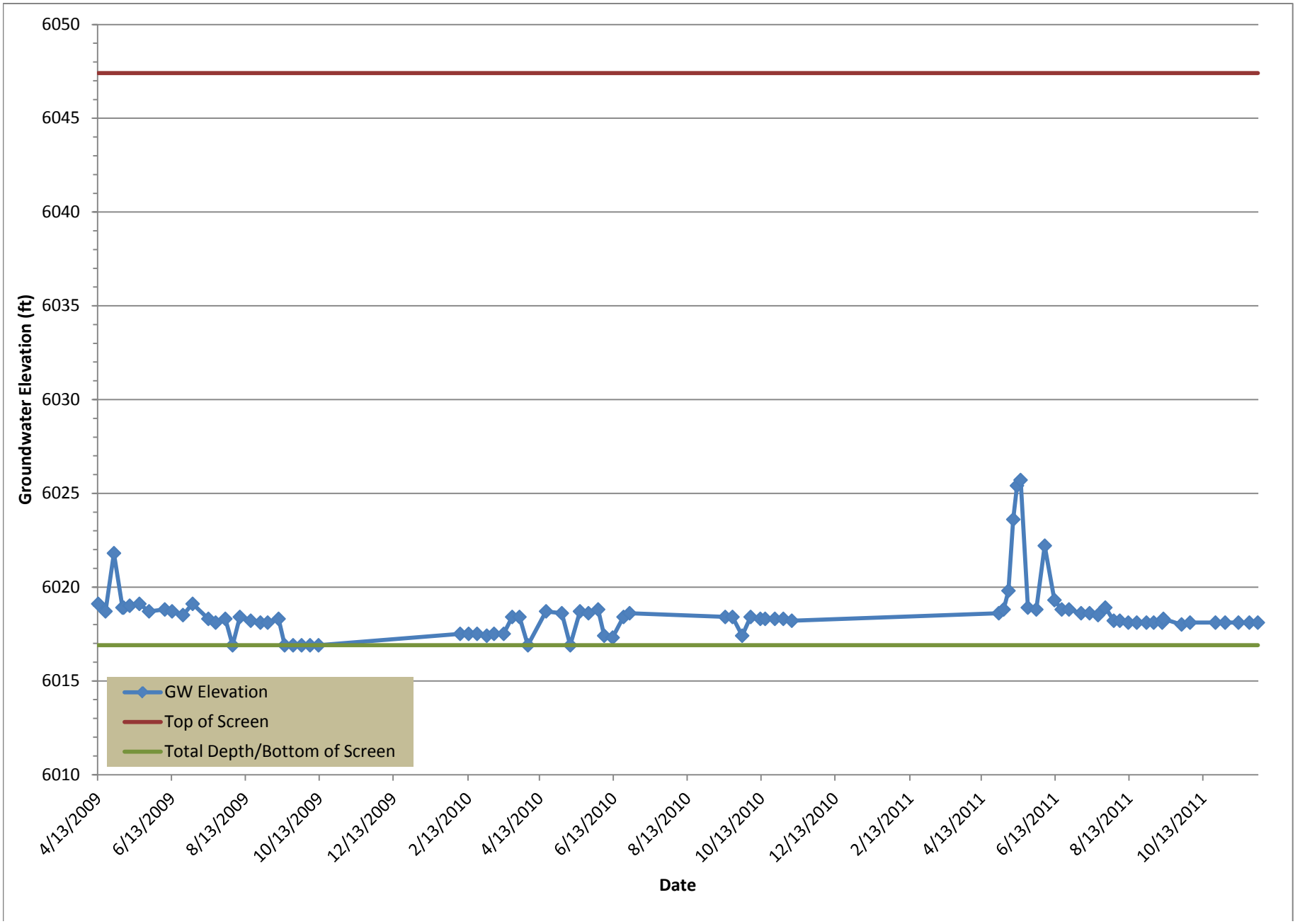


FIGURE F-24. CMMW-8 GROUNDWATER ELEVATIONS
COMBINATION MINE AOC
BLACK PINE MINE

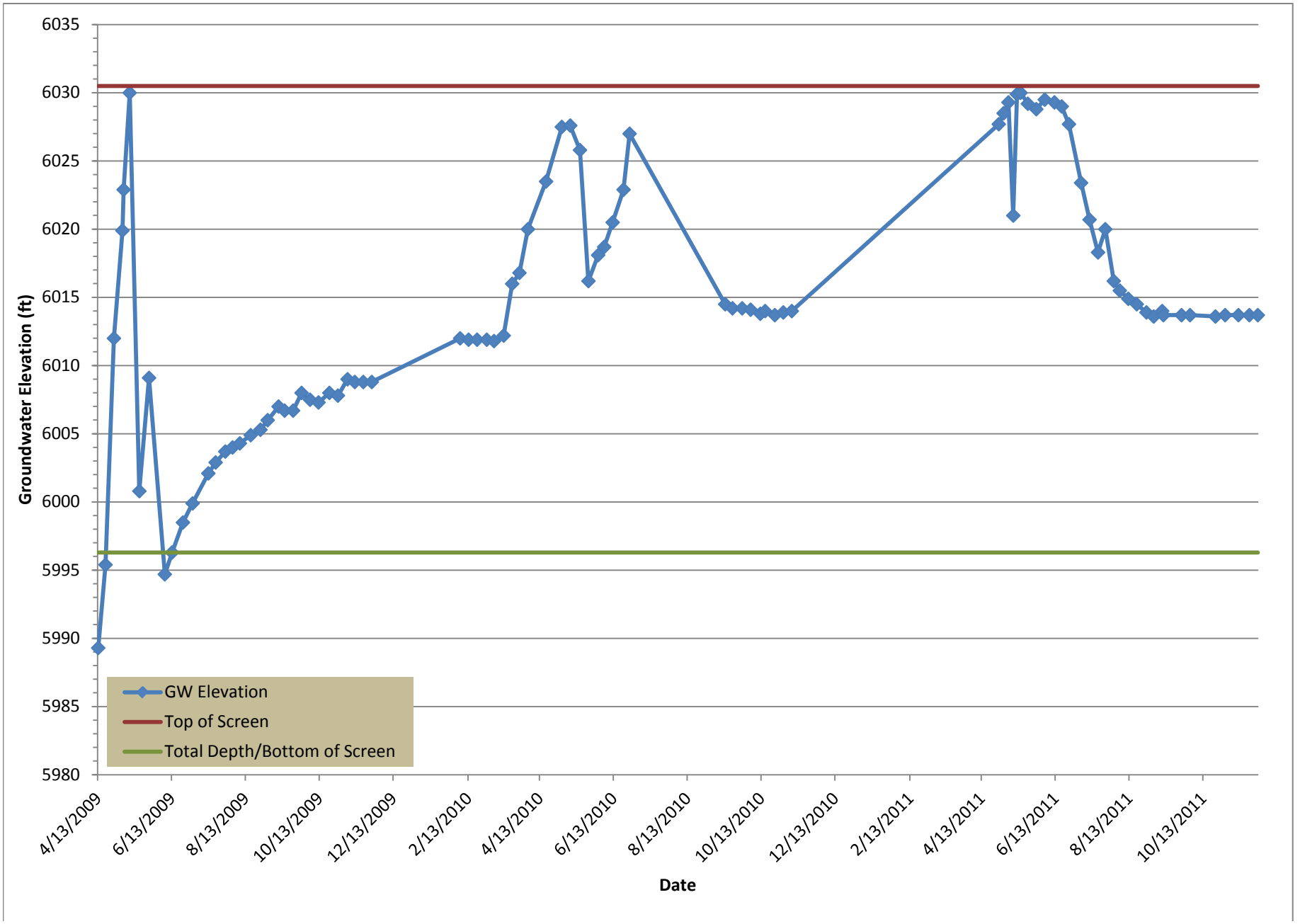


FIGURE F-25. CMMW-9 GROUNDWATER ELEVATIONS
COMBINATION MINE AOC
BLACK PINE MINE

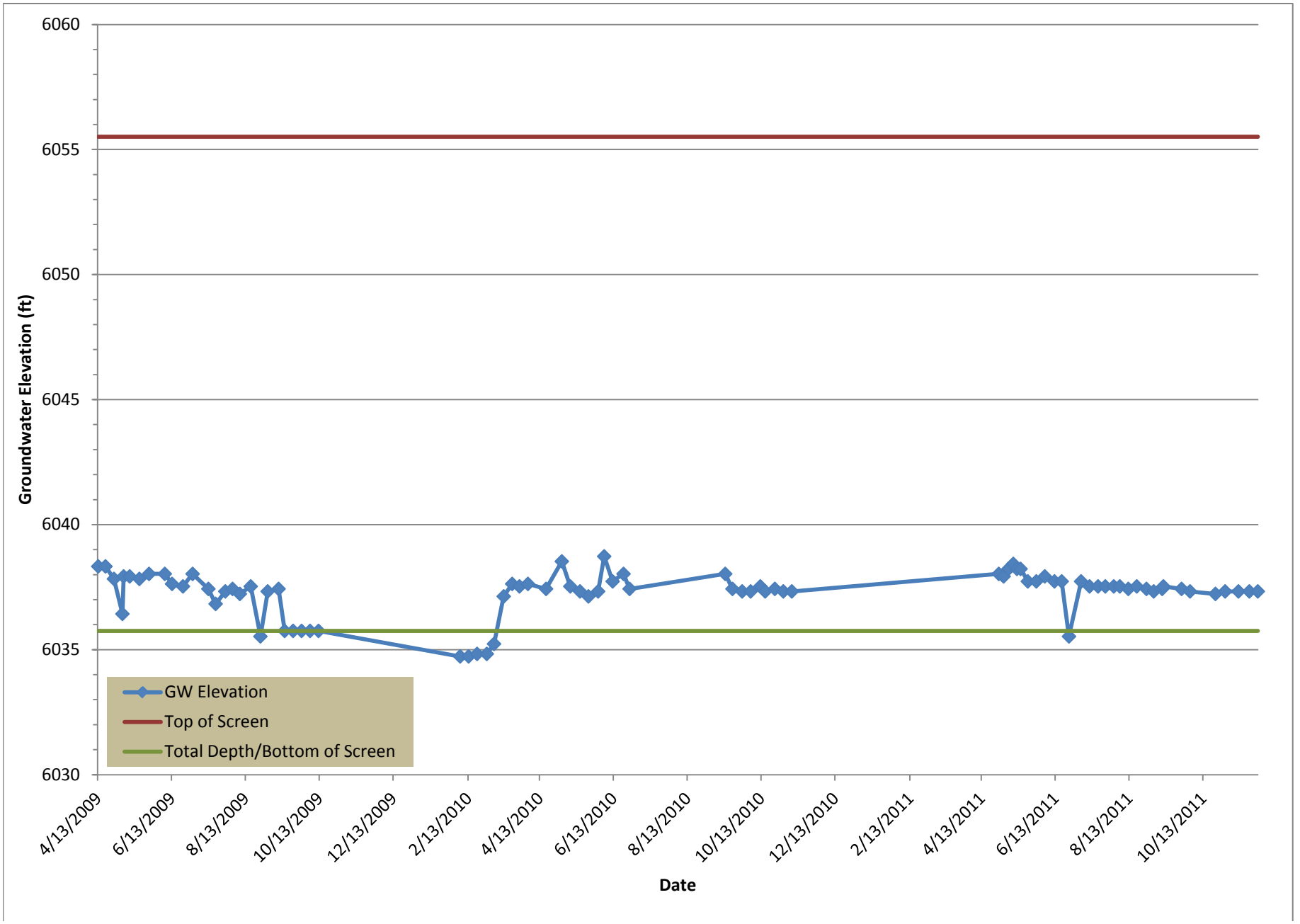


FIGURE F-26. MINE POOL ELEVATIONS
COMBINATION MINE AOC
BLACK PINE MINE

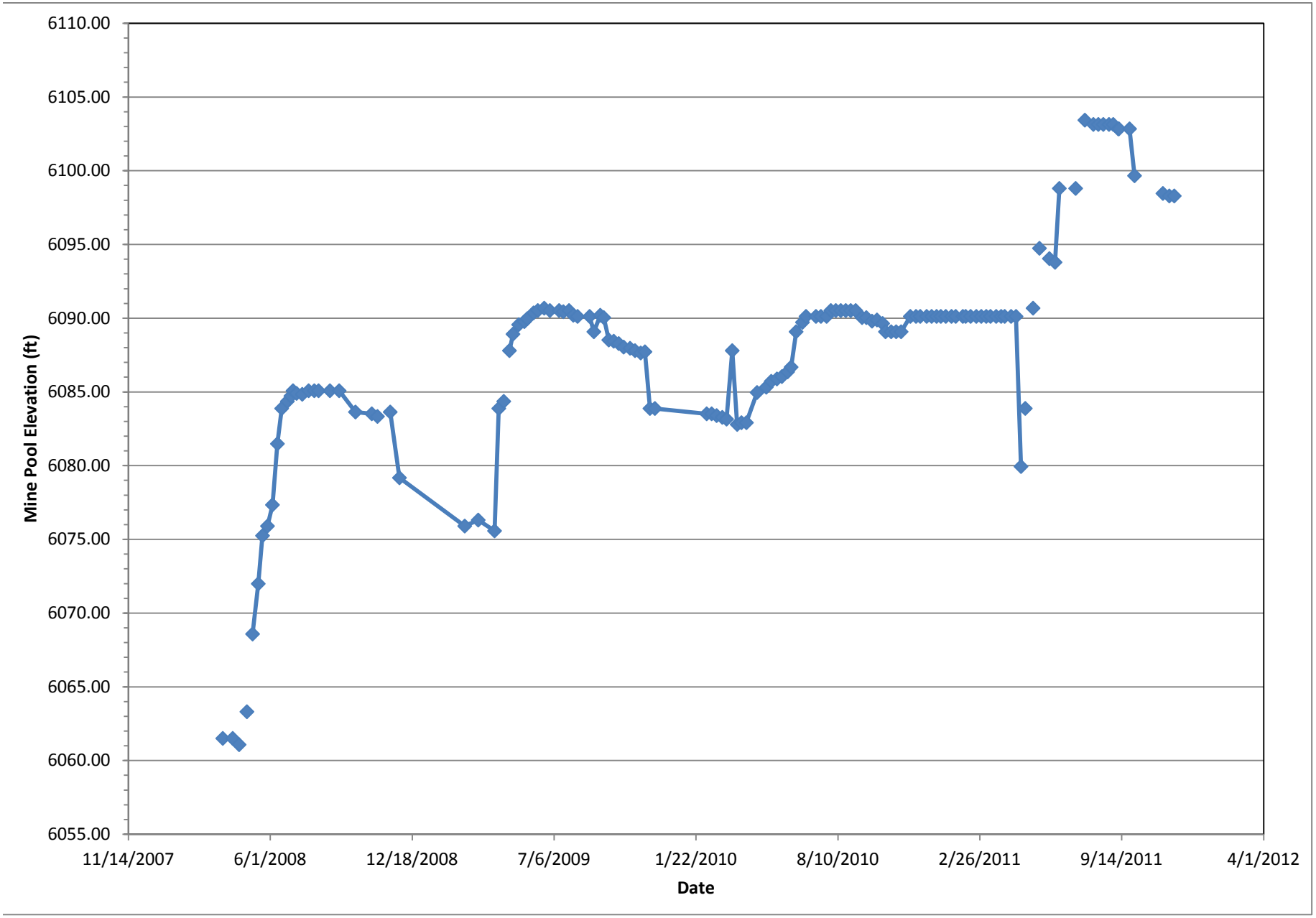
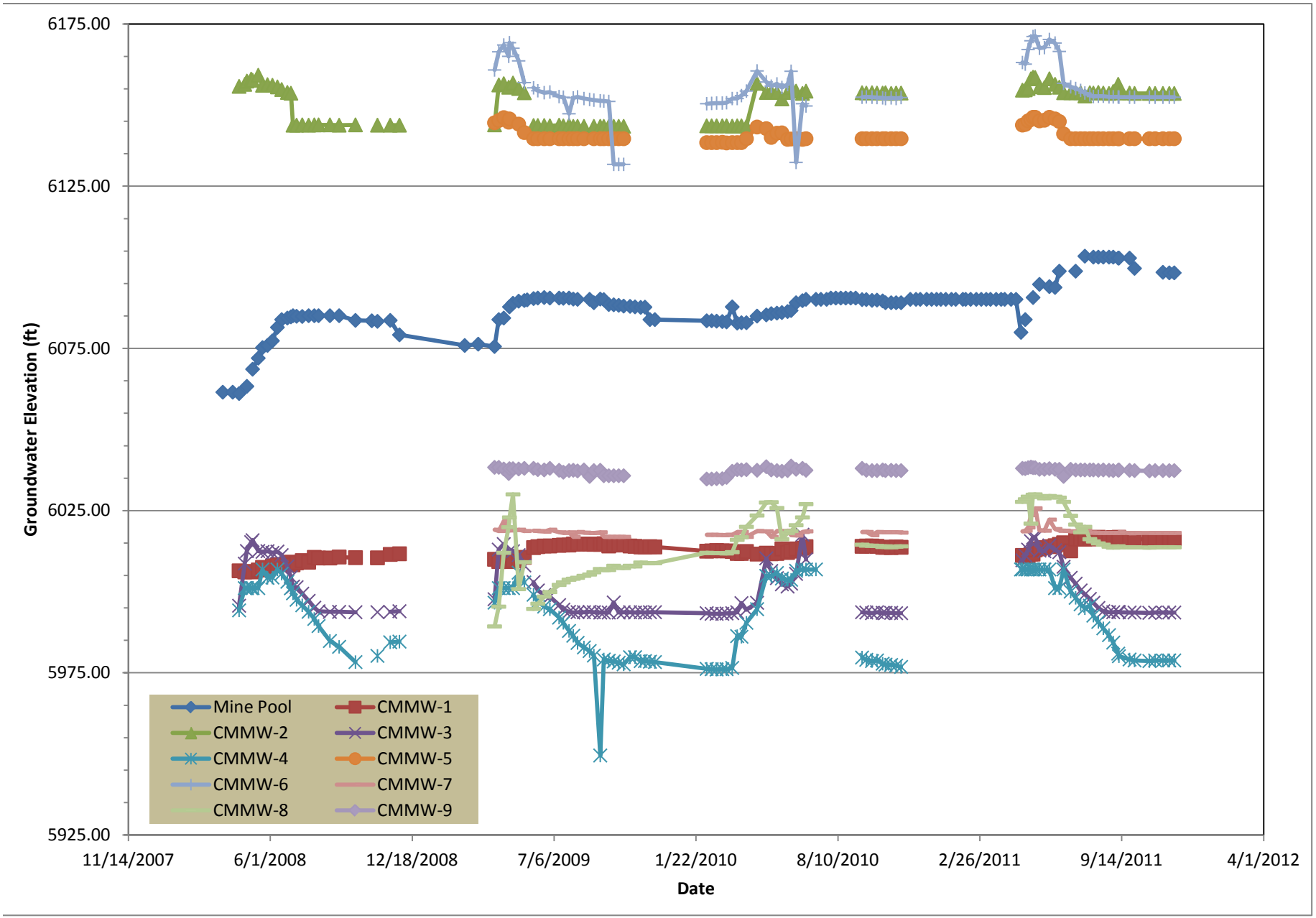


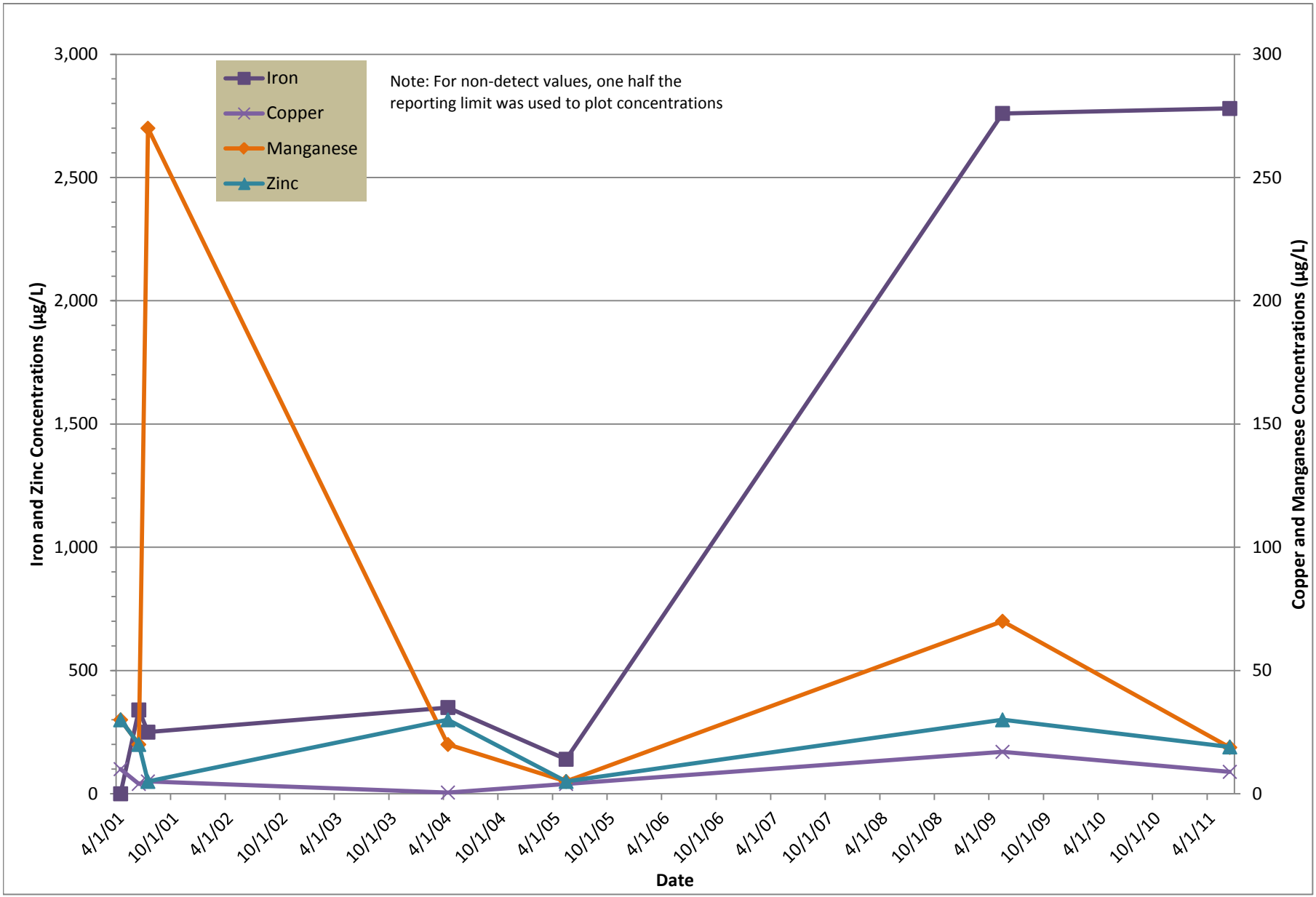
FIGURE F-27. GROUNDWATER ELEVATIONS
COMBINATION MINE AOC
BLACK PINE MINE



APPENDIX F4

TIM SMITH MINE AOC SURFACE WATER TREND GRAPH

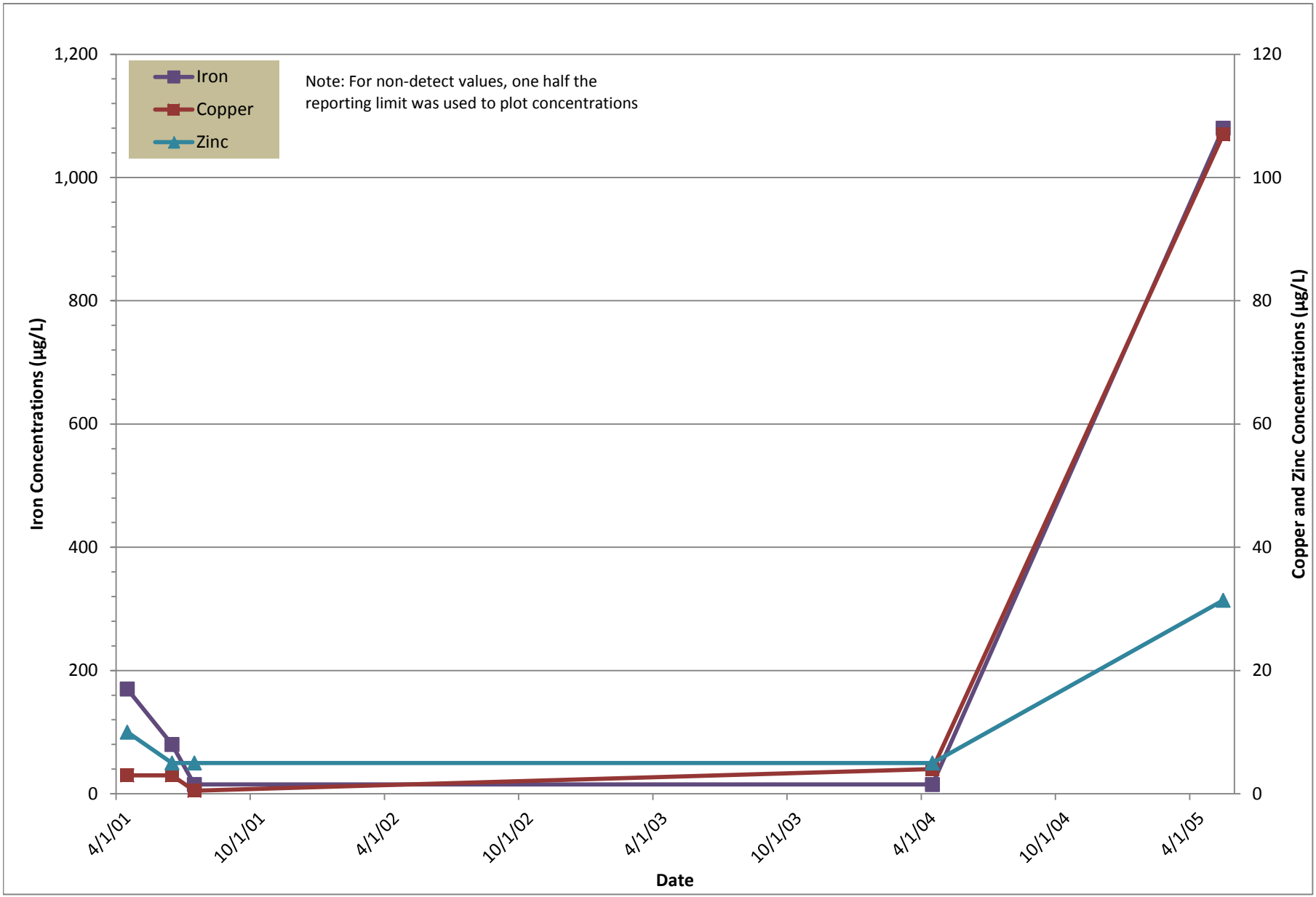
FIGURE F-28. TSP-9 COPPER, IRON, MANGANESE, AND ZINC CONCENTRATIONS OVER TIME
TIM SMITH MINE AOC
BLACK PINE MINE



APPENDIX F5

HISTORIC MINE AOC SURFACE WATER TREND GRAPH

FIGURE F-29. MCSP-1 COPPER, IRON, AND ZINC CONCENTRATIONS OVER TIME
HISTORIC MINE AOC
BLACK PINE MINE



APPENDIX G

SYNOPTIC SAMPLING FIGURES

Figure G-1.
Synoptic sampling:
Discharge.

Legend

- Synoptic sample location
- Discharge (CFS)
- Trust property boundary

N

0 650 1,300 2,600 Feet

HERRERA

Basemap: USGS, 2000
Coordinates: NAD83 StatePlane Montana (feet)

Produced By: GIS ( )
Project: K:\Projects\06-03425-011\Project\synoptic_sample_results.mxd (4/10/2012)

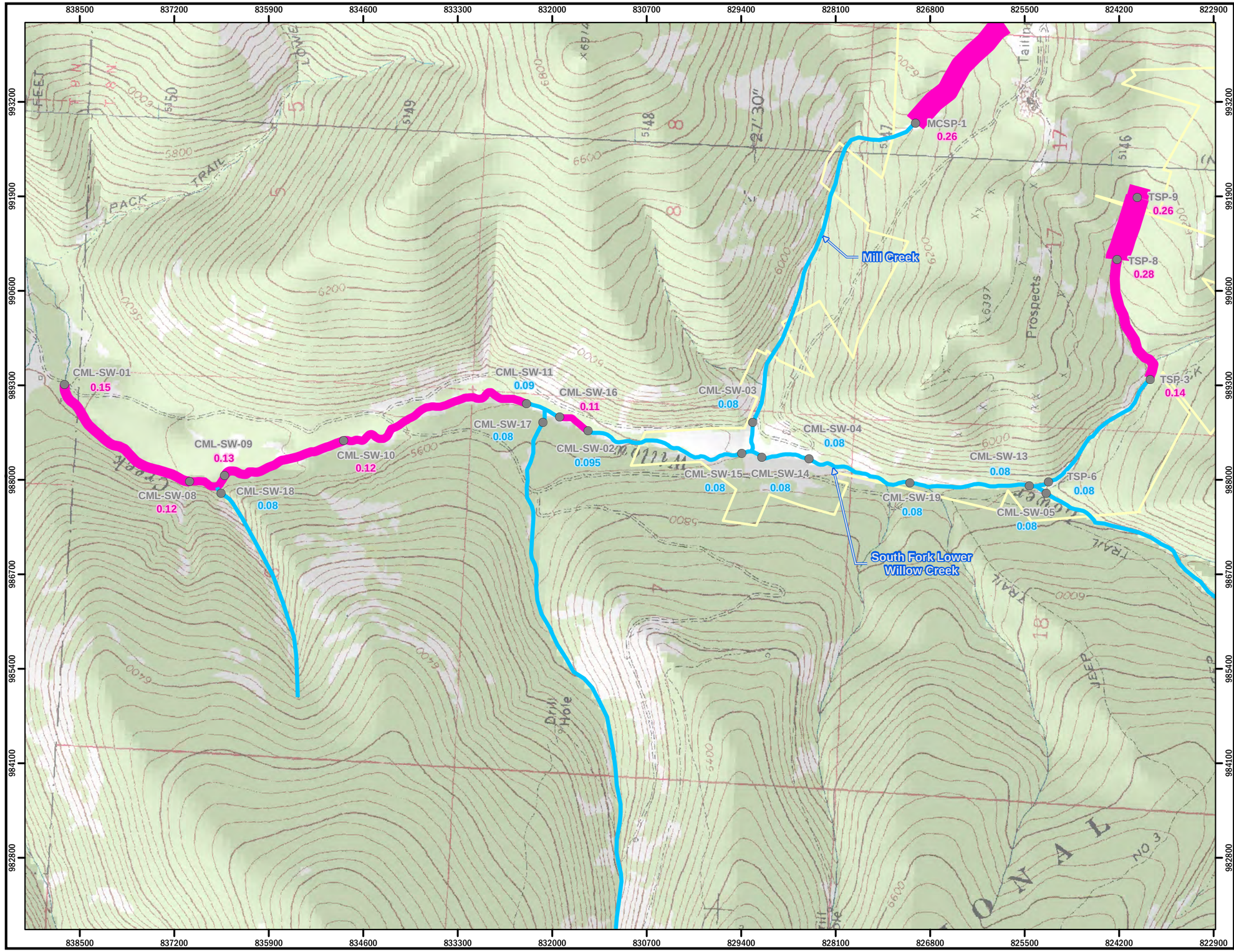


Figure G-2.
Synoptic sampling:
Cadmium concentration.

Legend

- Synoptic sample location

Cadmium concentration (µg/L)

- Exceeds DEQ RBCG standards
- Below DEQ RBCG standards

- Trust property boundary

N

0 650 1,300 2,600 Feet

HERRERA

Basemap: USGS, 2000
Coordinates: NAD83 StatePlane Montana (feet)

Produced By: GIS ( )
Project: K:\Projects\06-03425-011\Project\synoptic_sample_results.mxd (4/10/2012)

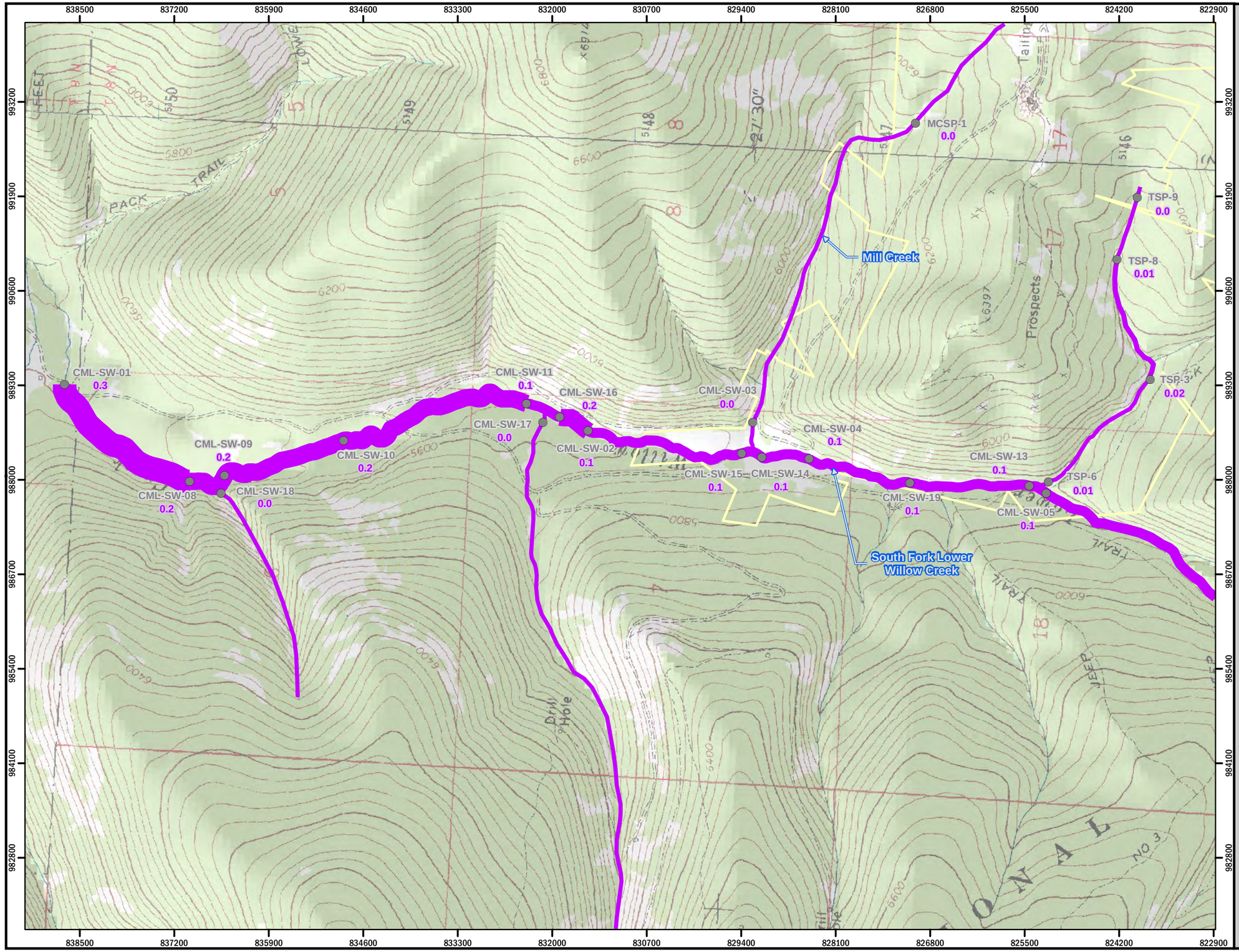


Figure G-3.
Synoptic sampling:
Cadmium loading.

Legend

- Synoptic sample location
- Cadmium loading (mg/s)
- Trust property boundary

N

0 650 1,300 2,600 Feet

HERRERA

Basemap: USGS, 2000
Coordinates: NAD83 StatePlane Montana (feet)

Produced By: GIS ( )
Project: K:\Projects\06-03425-011\Project\synoptic_sample_results.mxd (4/10/2012)

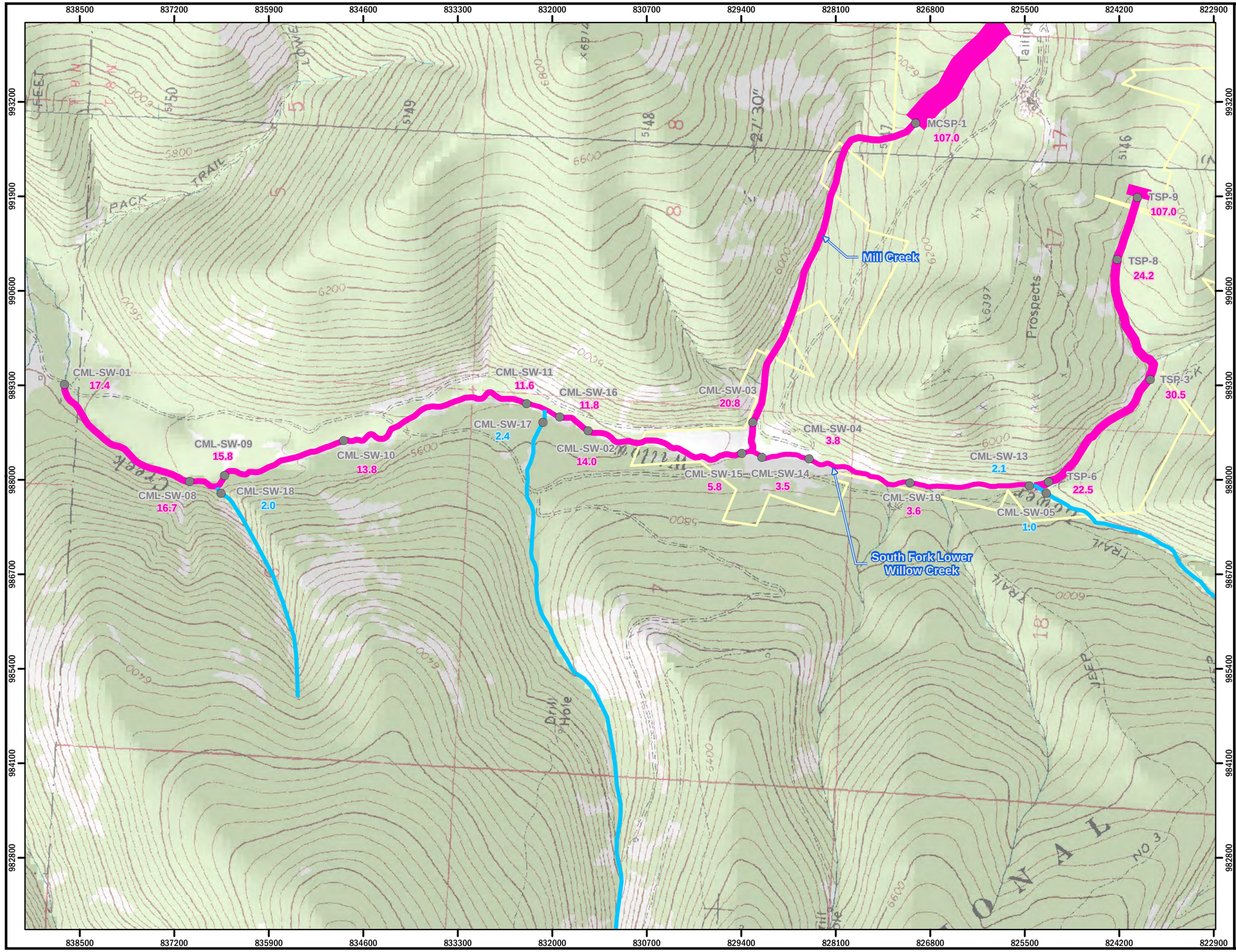


Figure G-4.
Synoptic sampling:
Copper concentration.

Legend

- Synoptic sample location

Copper concentration (µg/L)

- Exceeds DEQ RBCG standards
- Below DEQ RBCG standards

- Trust property boundary

N

0 650 1,300 2,600 Feet

HERRERA

Basemap: USGS, 2000
Coordinates: NAD83 StatePlane Montana (feet)

Produced By: GIS ( )
Project: K:\Projects\06-03425-011\Project\synoptic_sample_results.mxd (4/10/2012)

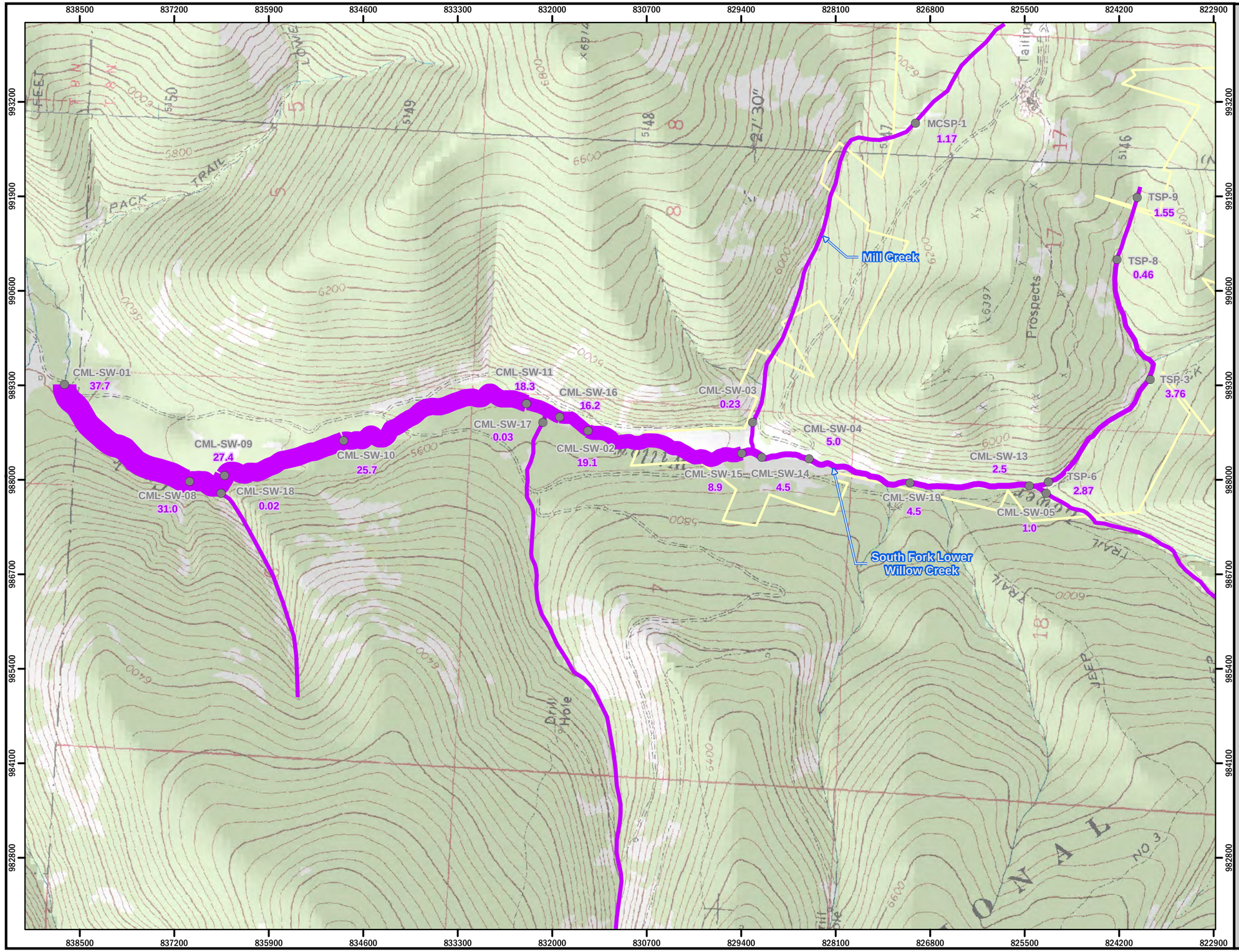


Figure G-5.
Synoptic sampling:
Copper loading.

Legend

- Synoptic sample location
- Copper loading (mg/s)
- Trust property boundary

N

0 650 1,300 2,600 Feet

HERRERA

Basemap: USGS, 2000
Coordinates: NAD83 StatePlane Montana (feet)

Produced By: GIS ( )
Project: K:\Projects\06-03425-011\Project\synoptic_sample_results.mxd (4/10/2012)

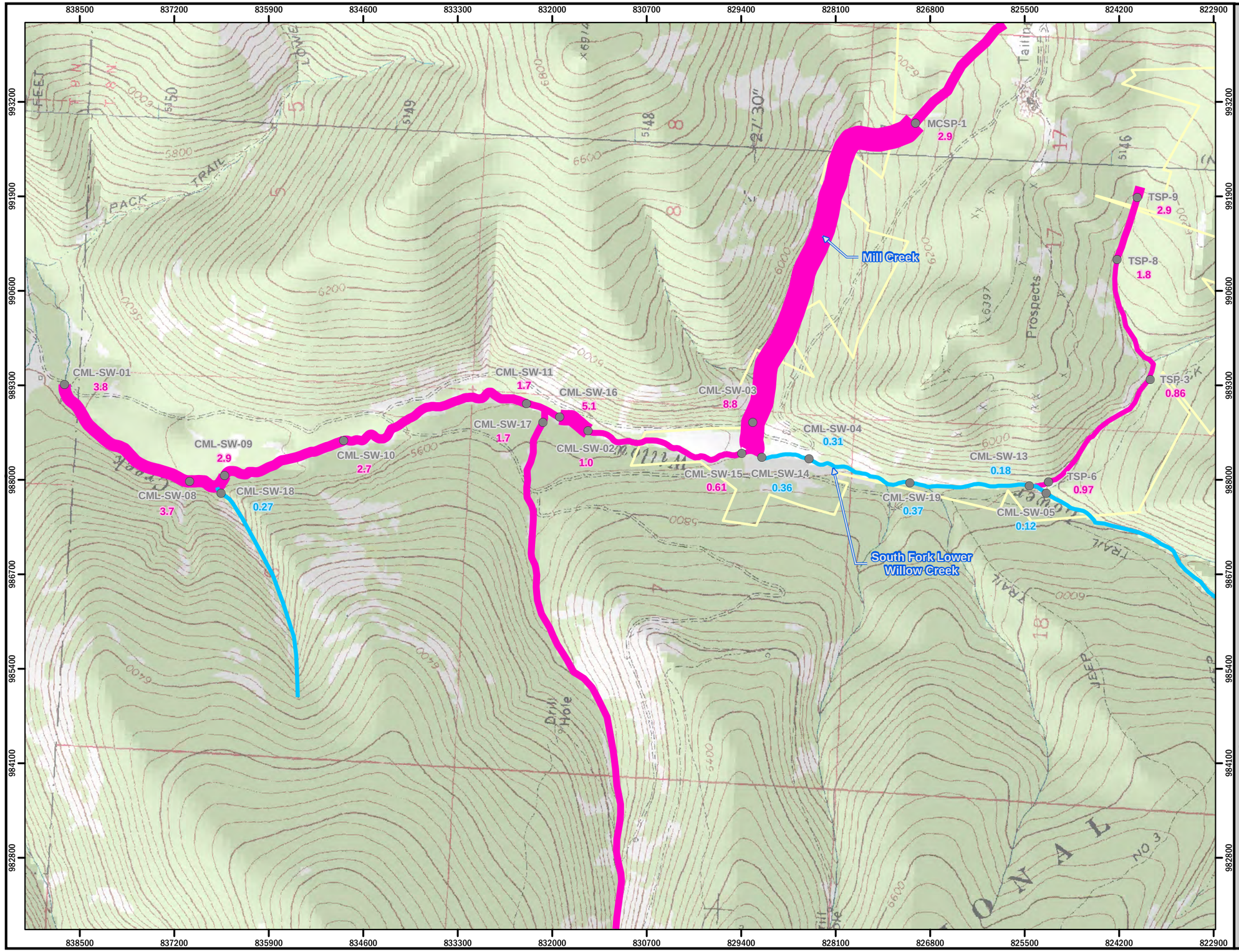


Figure G-6.
Synoptic sampling:
Lead concentration.

Legend

- Synoptic sample location

Lead concentration (µg/L)

- Exceeds DEQ RBCG standards
- Below DEQ RBCG standards
- Trust property boundary

N

0 650 1,300 2,600 Feet

HERRERA

Basemap: USGS, 2000
Coordinates: NAD83 StatePlane Montana (feet)

Produced By: GIS ( )
Project: K:\Projects\06-03425-011\Project\synoptic_sample_results.mxd (4/10/2012)

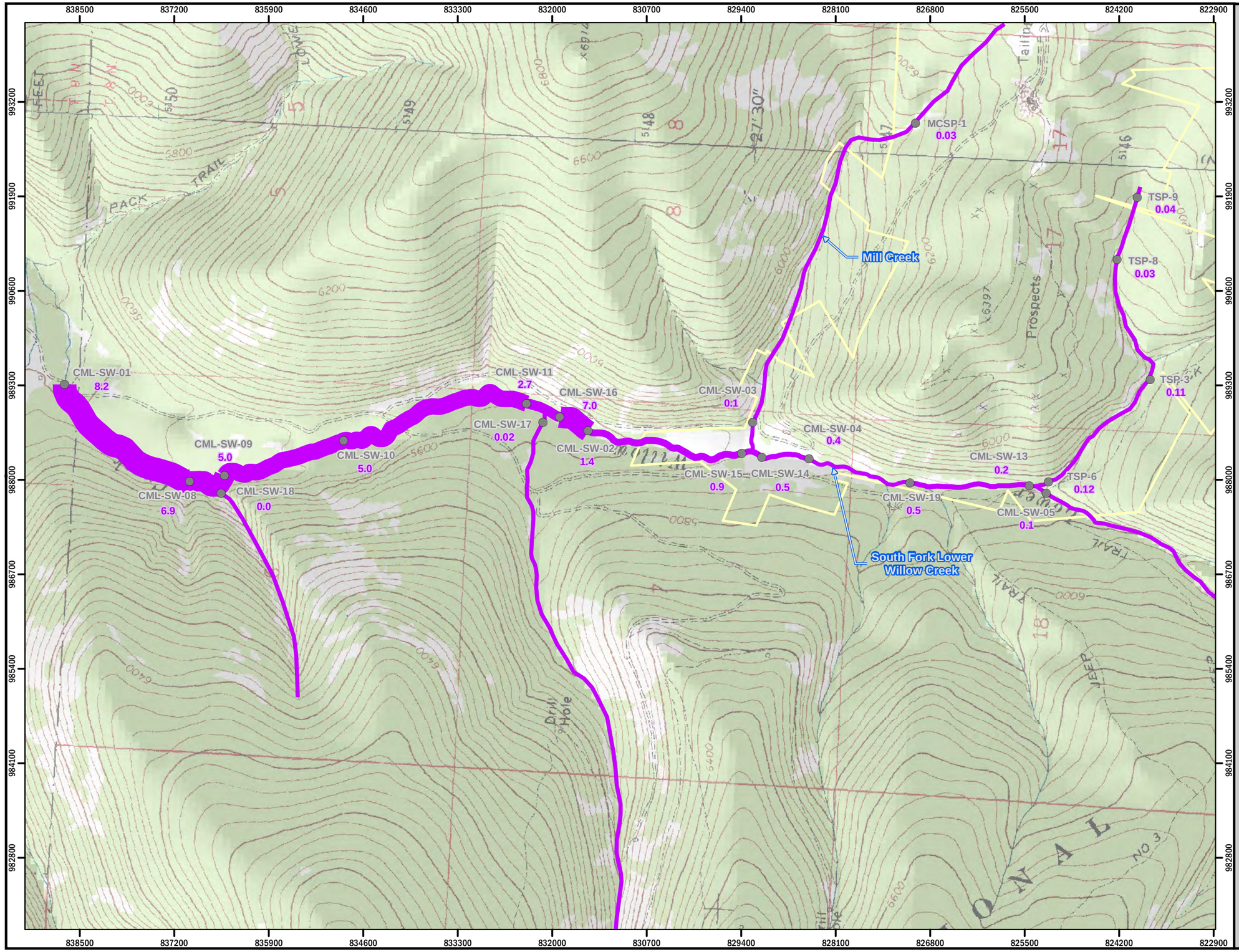


Figure G-7.
Synoptic sampling:
Lead loading.

Legend

- Synoptic sample location
- Lead loading (mg/s)
- Trust property boundary

N

0 650 1,300 2,600 Feet

HERRERA

Basemap: USGS, 2000
Coordinates: NAD83 StatePlane Montana (feet)

Produced By: GIS ( )
Project: K:\Projects\06-03425-011\Project\synoptic_sample_results.mxd (4/10/2012)

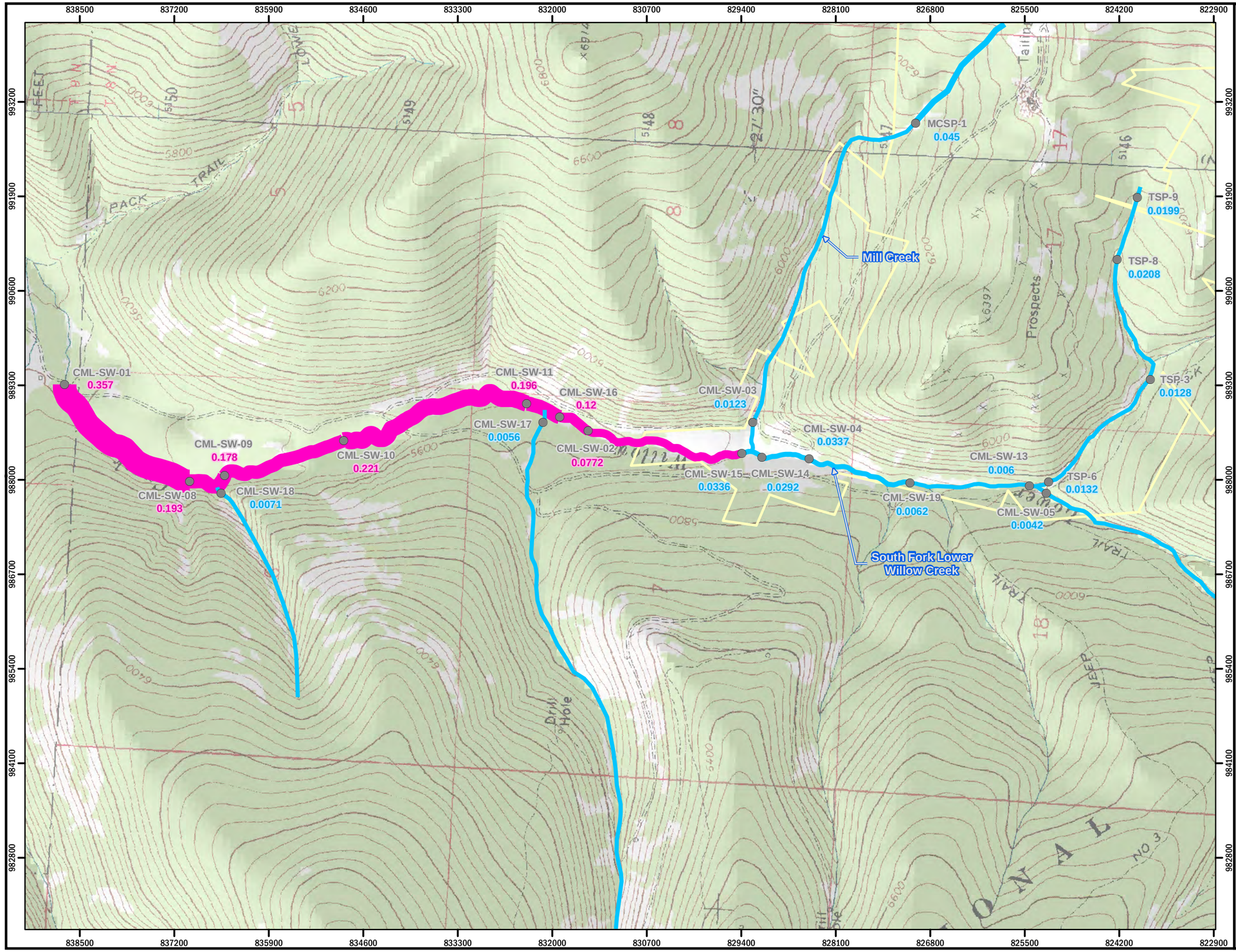


Figure G-8.
Synoptic sampling:
Mercury concentration.

Legend

- Synoptic sample location

Mercury concentration (µg/L)

- Exceeds DEQ RBCG standards
- Below DEQ RBCG standards

- Trust property boundary

N

0 650 1,300 2,600 Feet

HERRERA

Basemap: USGS, 2000
Coordinates: NAD83 StatePlane Montana (feet)

Produced By: GIS ( )
Project: K:\Projects\06-03425-011\Project\synoptic_sample_results.mxd (4/10/2012)

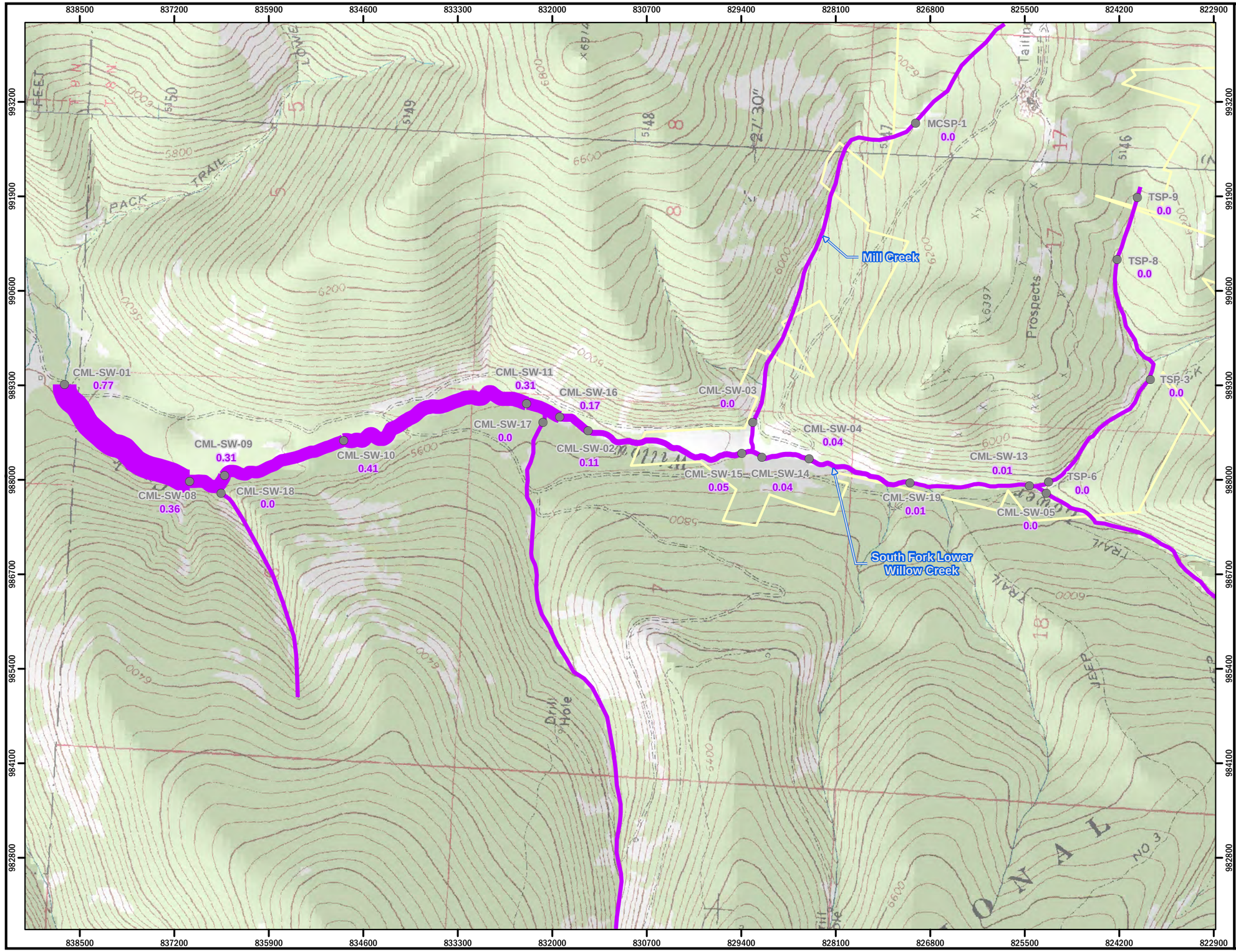


Figure G-9.
Synoptic sampling:
Mercury loading.

Legend

- Synoptic sample location
- Mercury loading (mg/s)
- Trust property boundary

N

0 650 1,300 2,600 Feet

HERRERA

Basemap: USGS, 2000
Coordinates: NAD83 StatePlane Montana (feet)

Produced By: GIS ( )
Project: K:\Projects\06-03425-011\Project\synoptic_sample_results.mxd (4/10/2012)

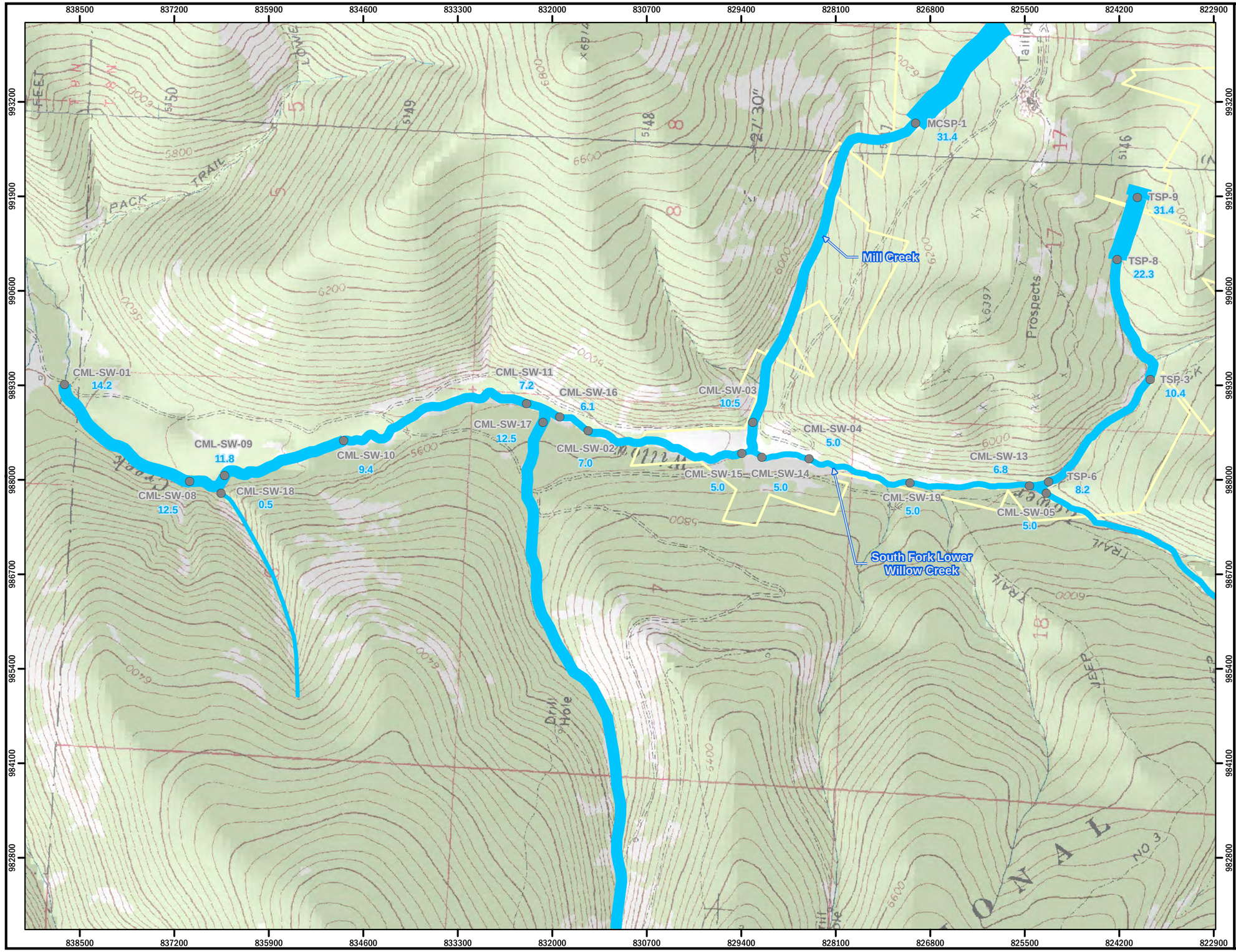


Figure G-10.
Synoptic sampling:
Zinc concentration.

Legend

- Synoptic sample location

Zinc concentration (µg/L)

- Exceeds DEQ RBCG standards
- Below DEQ RBCG standards

- Trust property boundary

N

0 650 1,300 2,600 Feet

HERRERA

Basemap: USGS, 2000
Coordinates: NAD83 StatePlane Montana (feet)

Produced By: GIS ( )
Project: K:\Projects\06-03425-011\Project\synoptic_sample_results.mxd (4/10/2012)

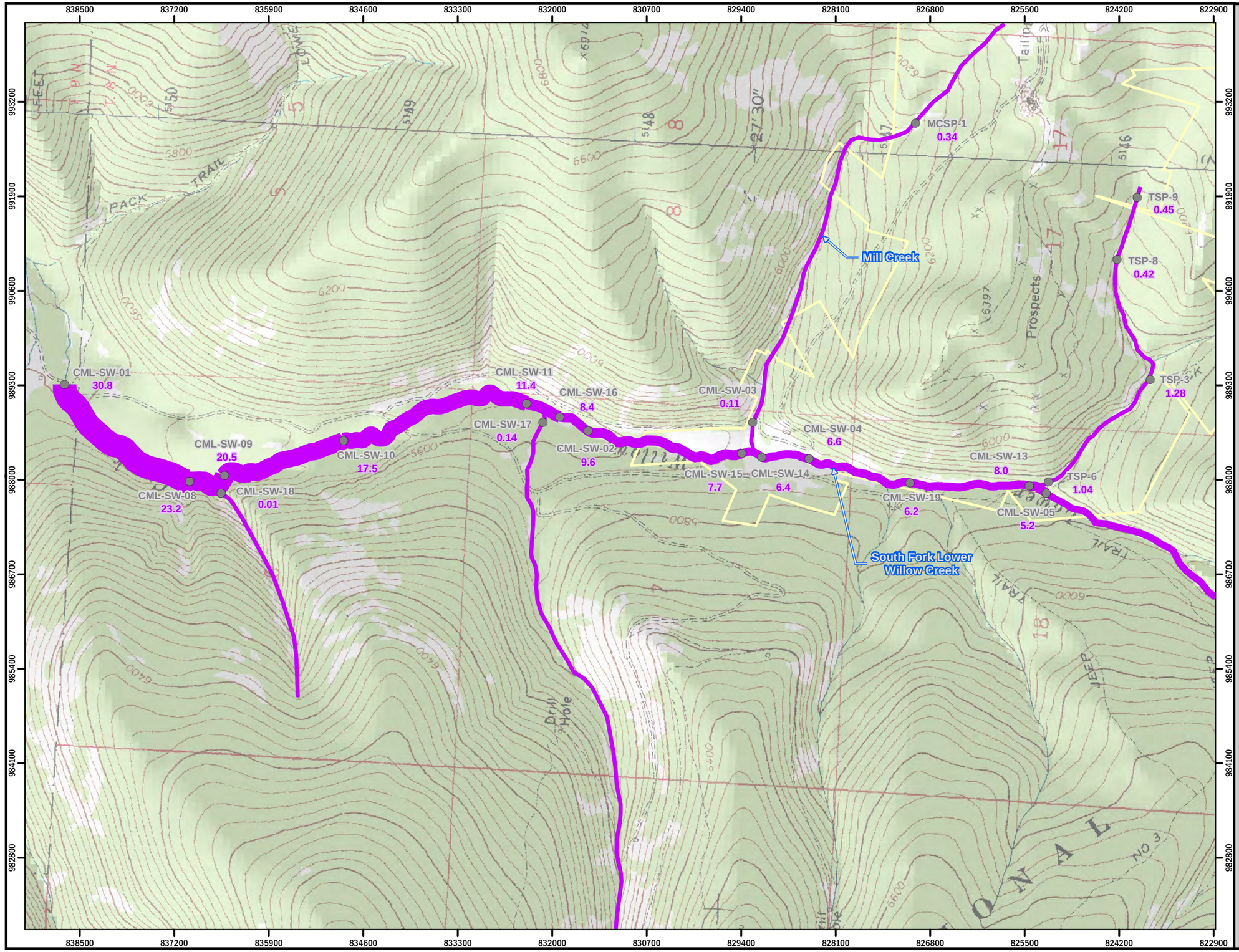


Figure G-11.
Synoptic sampling:
Zinc loading.

Legend

- Synoptic sample location
- Zinc loading (mg/s)
- Trust property boundary

N

0 650 1,300 2,600 Feet

HERRERA

Basemap: USGS, 2000
Coordinates: NAD83 StatePlane Montana (feet)

Produced By: GIS ( )
Project: K:\Projects\06-03425-011\Project\synoptic_sample_results.mxd (4/10/2012)

APPENDIX H

GEOTECHNICAL TEST RESULTS

TABLE H-1. GEOTECHNICAL TESTING RESULTS - INDEX TESTS
BLACK PINE MINE

Location	Field Sample ID	Lab Sample ID	Date Sampled	Sample Location Description	Sample Depth (ft) [e]	ASTM D2487 General Material Description [a]	ASTM D2487 USCS Classification Based on Lab Testing	ASTM D2216 Moisture Content as Received (%)	ASTM D4318 Liquid Limit	ASTM D4318 Plastic Limit	ASTM D4318 Plasticity Index	OVERSIZE CORRECTED ASTM D4318 Atterberg Classification of Fines [b]	OVERSIZE CORRECTED AASHTO T99 C Maximum Dry Unit Weight (pcf)	OVERSIZE CORRECTED AASHTO T99 C Optimum Water Content (%)	Oversized Material (%)	AASHTO T85 Specific Gravity (-2 mm)	Percent of Total Fines (%)	Percent of Total Coarse (%)	AASHTO T100-03 Specific Gravity Weight Average	ASTM D5084 C Permeability (cm/sec)
RY-SS-01	BP-RY-SS-01-00	11182	7/12/2011	Repository 1	0 - 1.3	SILTY GRAVEL w/ SAND	GM	4.0	34	29	5	ML	128.0	10.7	18.4	2.559	25.43	74.57	2.670	
RY-SS-01	BP-RY-SS-01-02	11174	7/12/2011	Repository 1	1.3 - 2.7	Well graded GRAVEL w/ SILT & SAND	GW-GM	2.7	23	20	3	ML	132.6	6.4	21	2.659	11.62	88.38	2.703	
RY-SS-02	BP-RY-02-00	11180	7/12/2011	Repository 1	0 - 0.5	Well graded GRAVEL w/ SILT	GW-GM	4.3	62	52	10	MH	139.4	5.9	61.4	2.477	10.12	89.88	2.690	
RY-SS-02	BP-RY-02-01	11183	7/12/2011	Repository 1	0.5 - 2.7	SILTY GRAVEL	GM	6.8	34	28	6	ML	too coarse for Proctor test		---	2.635	18.04	81.96	2.661	
RY-SS-03	BP-RY-SS-03-00	11176	7/12/2011	Repository 2	0 - 1.5	SILTY GRAVEL	GM	3.8	22	21	1	ML	131.0	7.9	24.0	2.638	34.96	65.04	2.694	
RY-SS-03	BP-RY-SS-03-01	11178	7/12/2011	Repository 2	13	SILTY, CLAYEY COBBLES & GRAVEL	GC-GM	10.1	23	18	5	CL-ML	131.1	9.6	55.3	2.678	34.81	65.19	2.610	
RY-SS-04	BP-RY-SS-04-00	11181	7/12/2011	Repository 2	0 - 1.5	Well graded GRAVEL w/ SILT	GW-GM	7.5	22	20	2	ML	135.5 [d]	6.0 [d]	38.9	2.640	11.51	88.49	2.668	
RY-SS-04	BP-RY-SS-04-01	11175	7/12/2011	Repository 2	8	SILTY, CLAYEY COBBLES & GRAVEL, w/ SAND	GC-GM	5.5	19	15	4	ML	138.4	5.9	32.1	2.641	54.51	45.49	2.649	
RY-SS-05	BP-RY-SS-05-00	11177	7/12/2011	Repository 3	0.5 - 1.5	SILTY GRAVEL	GM	4.2	50	43	7	MH	115.8	9.5	40.9	2.426	22.76	77.24	2.634	
RY-SS-05	BP-RY-SS-05-01	11179	7/12/2011	Repository 3	5	Well graded GRAVEL	GW	4.1	21	20	1	ML	too coarse for Proctor test		---	2.650	2.91	97.09	2.701	
CML-TS-11 [f]	BP-CML-TS-11-08	11197	7/15/2011	Combination Mill Repository	8-10	CLAYEY GRAVEL w/ SAND	GC	not tested, missed by lab	35	14	21	CL	120.2 [d]	14.1 [d]	20.7	2.731	41.46	58.54	2.670	
MW-RY-06	BP-RY-06	11503	8/16/2011	Repository 2	3 - 12	GRAVELLY LEAN CLAY, w/ SAND	CL	14.5	46	16	30	CL	116.6 [c]	14.4 [c]	21	2.716	79.01	20.99	2.704	6.3E-07
MW-RY-07	BP-RY-07	11505	8/17/2011	Repository 2	0.5 - 3	SILTY GRAVEL w/ SAND	GM	6.4	31	30	1	ML	Sample volume too small for Proctor test		---	2.580	60.5	39.5	2.615	
MW-RY-08	BP-RY-08	11504	8/17/2011	Repository 2	8 - 10	SILTY GRAVEL w/ SAND	GM	4.0	19	17	2	ML	139.7 [d]	7.9 [d]	13.3	2.668	38.53	61.47	2.662	
HM-RS-06	BP-HM-RS-06	11184	7/13/2011	Harper Shaft waste rock	1 - 3	SILTY GRAVEL w/ SAND	GM	10.5	20	18	2	ML	134.9	7.8	43.3	2.628 [g]	36.84	63.16	2.619	
HM-RS-01	BP-HM-RS-01-05	11185	7/13/2011	Harrison Shaft waste rock	5	CLAYEY COBBLES & GRAVEL w/ SAND	GC	16.1	36	15	21	CL	121.9	12.8	23.7	2.631 [g]	58.99	41.01	2.650	
TS-RS-01	BP-TS-RS-01	11186	7/12/2011	Tim Smith No. 1 Adit waste rock	4 - 6	Well graded GRAVEL w/ SILT & SAND	GW-GM	not tested, missed by lab	NP	NP	NP	NP	135.5	7.6	23.6	2.637 [g]	43.59	56.41	2.650	
CMN-SS-09	BP-CMN-SS-09-00	11195	7/14/2011	Combination Mine N Soils Removal Area	0 - 1	SILTY, CLAYEY GRAVEL, w/ SAND	GC-GM	16.4	26	21	5	CL-ML	118.0	12.3	16.7	2.575 [g]	50.76	49.24	2.613	
CMN-SS-11	BP-CMN-SS-11-00	11196	7/14/2011	Combination Mine S Soils Removal Area	0 - 1	SILTY SAND w/ GRAVEL	SM	not tested, missed by lab	16	15	1	ML	128.5	9.1	19.4	2.632 [g]	70.05	29.95	2.635	

[a] General Material Descriptions generally do not include the oversized (cobbles) in the descriptions.
[b] Atterberg Limits performed on soil passing the #40 sieve.
[c] Proctor test performed using ASTM D698 Method A
[d] Proctor test performed using AASHTO T180 Method C
[e] Sample depths from HM-RS-06, HM-RS-01, TS-RS-01, CMN-SS-09, CMN-SS-11, and CML-SS-11 were listed as 0 in the lab reports. The correct depths are shown in Tables H-1 and H-2.
[f] Field sample CML-TS-11-08 was incorrectly listed in the lab reports as CMN-TS-11-08.
[g] Fine grained portion of samples screened to material passing the 4.75 mm screen, rather than the 2 mm screen.
cm/sec: centimeters per second
ft: feet
pcf: pounds per cubic foot
USCS: Unified Soil Classification System

TABLE H-2. GEOTECHNICAL TESTING RESULTS - PARTICLE SIZE DISTRIBUTION SUMMARY
BLACK PINE MINE

Location	Field Sample ID	Lab Sample ID	Date Sampled	Sample Location Description	Sample Depth (ft) [d]	ASTM D2487 General Material Description [a]	ASTM D2487 USCS Classification Based on Lab Testing	Particle Size Distribution ASTM D422 % Cobbles [b] Passing 3" sieve [c]	% Gravel	% Sand	% Silt	% Clay	Curvature Coefficient C_c $D_{30}^2/(D_{10}D_{60})$	Uniformity Coefficient C_u D_{60}/D_{10}
RY-SS-01	BP-RY-SS-01-00	11182	7/12/2011	Repository 1	0 - 1.3	SILTY GRAVEL w/ SAND	GM	100	62.2	20.3	14.2	3.3	40.98	491.95
RY-SS-01	BP-RY-SS-01-02	11174	7/12/2011	Repository 1	1.3- 2.7	Well graded GRAVEL w/ SILT & SAND	GW-GM	100	72.7	22.0	4.5	0.7	1.59	7.72
RY-SS-02	BP-RY-SS-02-00	11180	7/12/2011	Repository 1	0 - 0.5	Well graded GRAVEL w/ SILT	GW-GM	100	85.9	6.7	6.7	0.7	2.84	19.70
RY-SS-02	BP-RY-SS-02-01	11183	7/12/2011	Repository 1	0.5 - 2.7	SILTY GRAVEL	GM	~86	61.7	10.8	12.3	1.8	59.87	1142.05
RY-SS-03	BP-RY-SS-03-00	11176	7/12/2011	Repository 2	0 - 1.5	SILTY GRAVEL	GM	100	57.0	13.4	26.3	3.3	0.06	847.06
RY-SS-03	BP-RY-SS-03-01	11178	7/12/2011	Repository 2	13	SILTY, CLAYEY COBBLES & GRAVEL	GC-GM	~76	41.8	10.5	20.1	3.3	0.35	1082.36
RY-SS-04	BP-RY-SS-04-00	11181	7/12/2011	Repository 2	0 - 1.5	Well graded GRAVEL w/ SILT	GW-GM	100	80.9	12.6	5.6	0.9	2.53	14.61
RY-SS-04	BP-RY-SS-04-01	11175	7/12/2011	Repository 2	8	SILTY, CLAYEY COBBLES & GRAVEL, w/ SAND	GC-GM	100	43.5	17.9	30.5	8.0	0.08	1802.54
RY-SS-05	BP-RY-SS-05-00	11177	7/12/2011	Repository 3	0.5 - 1.5	SILTY GRAVEL	GM	100	70.9	12.1	15.7	1.2	39.73	613.41
RY-SS-05	BP-RY-SS-05-01	11179	7/12/2011	Repository 3	5	Well graded GRAVEL	GW	~87	78.3	6.6	2.0	0.2	1.39	6.05
CML-TS-11 [e]	BP-CML-TS-11-08	11197	7/15/2011	Combination Mill Repository	8-10	CLAYEY GRAVEL w/ SAND	GC	100	37.8	26.9	23.0	12.3	---	---
MW-RY-06	BP-RY-06	11503	8/16/2011	Repository 2	3 - 12	GRAVELLY LEAN CLAY, w/ SAND	CL	100	21.0	19.8	35.8	23.3	---	---
MW-RY-07	BP-RY-07	11505	8/17/2011	Repository 2	0.5 - 3	SILTY GRAVEL w/ SAND	GM	100	39.9	25.5	30.5	4.2	0.08	548.73
MW-RY-08	BP-RY-08	11504	8/17/2011	Repository 2	8 - 10	SILTY GRAVEL w/ SAND	GM	100	61.6	16.4	19.6	2.4	16.29	262.39
HM-RS-06	BP-HM-RS-06	11184	7/13/2011	Harper Shaft waste rock	1 - 3	SILTY GRAVEL w/ SAND	GM	100	63.2	16.9	16.2	3.7	0.50	671.46
HM-RS-01	BP-HM-RS-01-05	11185	7/13/2011	Harrison Shaft waste rock	5	CLAYEY COBBLES & GRAVEL w/ SAND	GC	100	41.0	17.6	27.3	14.1	---	---
TS-RS-01	BP-TS-RS-01	11186	7/12/2011	Tim Smith No. 1 Adit waste rock	4 - 6	Well graded GRAVEL w/ SILT & SAND	GW-GM	100	56.4	32.6	8.9	2.0	1.27	149.97
CMN-SS-09	BP-CMN-SS-09-00	11195	7/14/2011	Combination Mine N Soils Removal Area	0 - 1	SILTY, CLAYEY GRAVEL, w/ SAND	GC-GM	100	49.2	24.2	21.5	5.0	0.12	597.39
CMN-SS-11	BP-CMN-SS-11-00	11196	7/14/2011	Combination Mine S Soils Removal Area	0 - 1	SILTY SAND w/ GRAVEL	SM	100	30.0	30.9	30.6	8.5	2.2	106.31

[a] General Material Descriptions generally do not include the oversized (cobbles) in the descriptions.

[b] Boulders and large cobbles removed before placing samples in 5-gallon buckets.

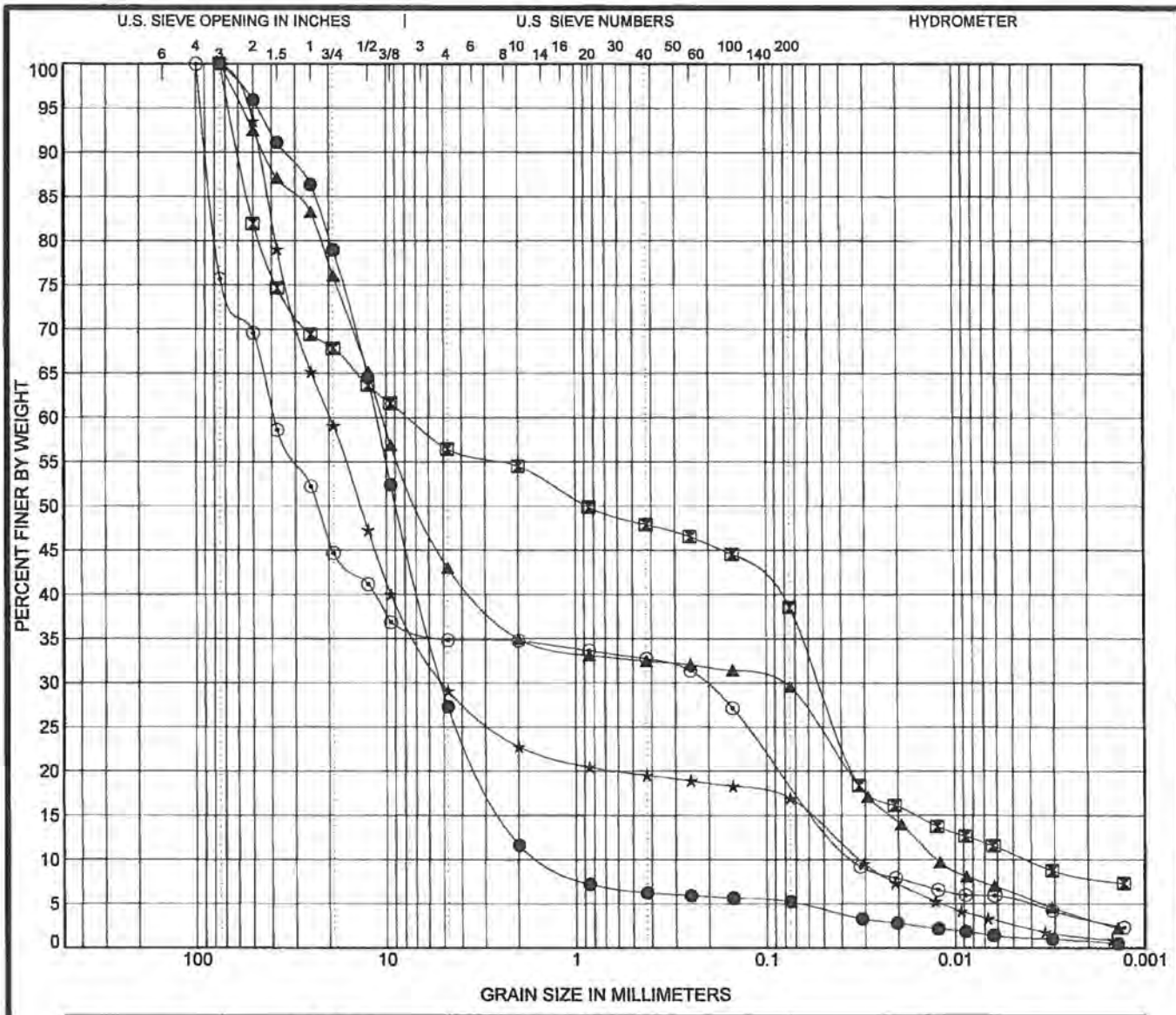
[c] Percentages estimated from the Grain Size Distribution Charts.

[d] Sample depths for HM-RS-06, HM-RS-01, TS-RS-01, CMN-SS-09, CMN-SS-11, and CML-SS-11 were listed as 0 in the lab reports. The correct depths are shown in Tables H-1 and H-2.

[e] Field sample CML-TS-11-08 was incorrectly listed in the lab reports as CMN-TS-11-08.

ft: feet

USCS: Unified Soil Classification System



COBBLES	GRAVEL		SAND			SILT OR CLAY
	coarse	fine	coarse	medium	fine	

	Specimen Identification		Classification	LL	PL	PI	Cc	Cu
●	Lab No. 11174	2.7	WELL-GRADED GRAVEL with SILT and SAND(GW-GM)	23	20	3	1.59	7.72
⊠	Lab No. 11175	8.0	SILTY, CLAYEY GRAVEL with SAND(GC-GM)	19	15	4	0.08	1802.5
▲	Lab No. 11176	1.5	SILTY GRAVEL(GM)	22	21	1	0.06	847.06
★	Lab No. 11177	1.5	SILTY GRAVEL(GM)	50	43	7	39.73	613.41
⊙	~~Lab No. 11178~~	~~13.0~~		~~23~~	~~18~~	~~5~~	~~0.03~~	~~1139.7~~

	Specimen Identification		D100	D50	D15	D10	%Gravel	%Sand	%Silt	%Clay
●	Lab No. 11174	2.7	75	8.892	2.41	1.46	72.7	22.0	4.5	0.7
⊠	Lab No. 11175	8.0	75	0.87	0.016	0.004	43.5	17.9	30.5	8.0
▲	Lab No. 11176	1.5	75	6.738	0.022	0.012	57.0	13.4	26.3	3.3
★	Lab No. 11177	1.5	75	13.755	0.059	0.032	70.9	12.1	15.7	1.2
⊙	~~Lab No. 11178~~	~~13.0~~	~~100~~	~~23.044~~	~~0.053~~	~~0.034~~	~~40.8~~	~~15.7~~	~~15.9~~	~~3.3~~

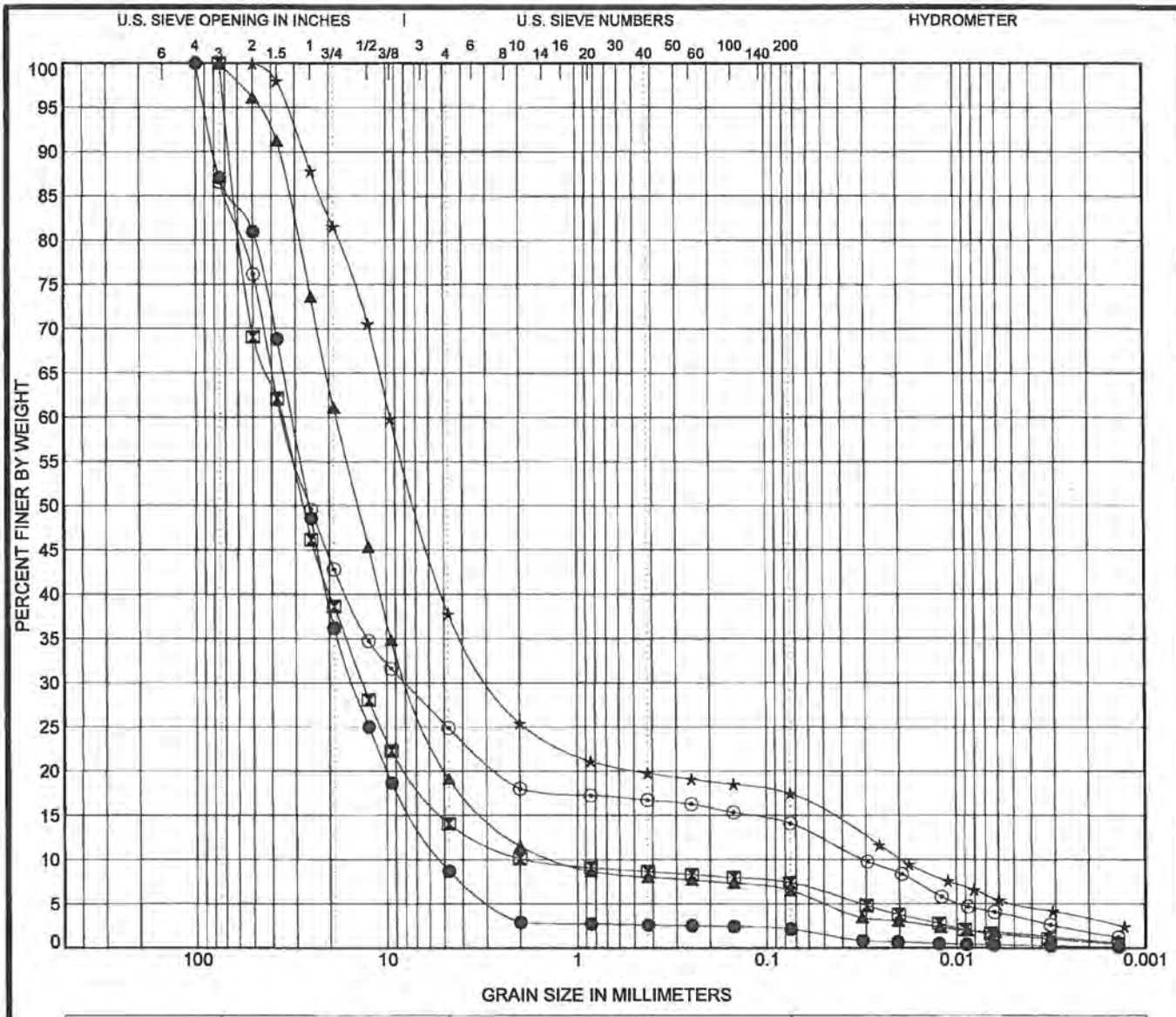
PIONEER TECHNICAL SERVICES, INC.

GRAIN SIZE DISTRIBUTION

Project: Black Pine Mine

Number: 15689

US GRAIN SIZE ASTM BLACK PINE MINE - 15689.GPJ PIONEER.GDT 9/16/11



COBBLES	GRAVEL		SAND			SILT OR CLAY
	coarse	fine	coarse	medium	fine	

Specimen Identification		Classification	LL	PL	PI	Cc	Cu
● Lab No. 11179	5.0	WELL-GRADED GRAVEL(GW)	21	20	1	1.39	6.05
⊠ Lab No. 11180	0.5	WELL-GRADED GRAVEL with SILT(GW-GM)	62	52	10	2.84	19.70
▲ Lab No. 11181	1.5	WELL-GRADED GRAVEL with SILT(GW-GM)	22	20	2	2.53	14.61
★ Lab No. 11182	1.3	SILTY GRAVEL with SAND(GM)	34	29	5	40.98	491.95
⊙ Lab No. 11183	2.7	SILTY GRAVEL(GM)	34	28	6	59.87	1142.05

Specimen Identification		D100	D50	D15	D10	%Gravel	%Sand	%Silt	%Clay
● Lab No. 11179	5.0	100	25.718	7.353	5.195	78.3	6.6	2.0	0.2
⊠ Lab No. 11180	0.5	75	27.559	5.137	1.803	85.9	6.7	6.7	0.7
▲ Lab No. 11181	1.5	75	14.146	2.969	1.263	80.9	12.6	5.6	0.9
★ Lab No. 11182	1.3	50	6.972	0.047	0.019	62.2	20.3	14.2	3.3
⊙ Lab No. 11183	2.7	100	25.36	0.123	0.031	61.7	10.8	12.3	1.8

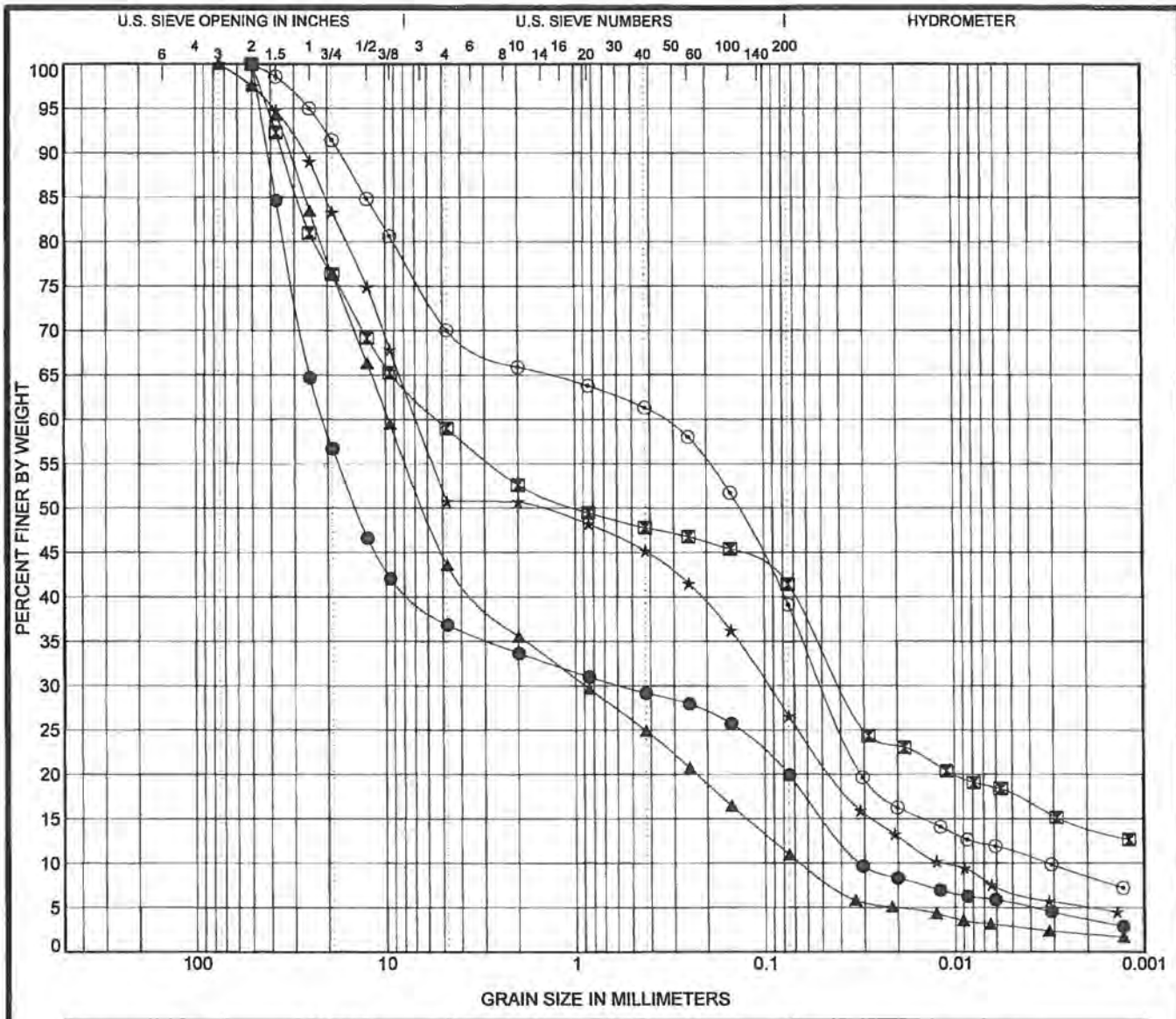
PIONEER TECHNICAL SERVICES, INC.

GRAIN SIZE DISTRIBUTION

Project: Black Pine Mine

Number: 15689

US GRAIN SIZE ASTM BLACK PINE MINE - 15689.GPJ PIONEER.GDT 9/16/11



COBBLES	GRAVEL		SAND			SILT OR CLAY
	coarse	fine	coarse	medium	fine	

Specimen Identification		Classification	LL	PL	PI	Cc	Cu
● Lab No. 11184	0.0	SILTY GRAVEL with SAND(GM)	20	18	2	0.50	671.46
⊠ Lab No. 11185	0.0	CLAYEY GRAVEL with SAND(GC)	36	15	21		
▲ Lab No. 11186	0.0	WELL-GRADED GRAVEL with SILT and SAND(GW-GM)	NP	NP	NP	1.27	149.97
★ Lab No. 11195	0.0	SILTY, CLAYEY GRAVEL with SAND(GC-GM)	26	21	5	0.12	597.39
⊙ Lab No. 11196	0.0	SILTY SAND with GRAVEL(SM)	16	15	1	2.20	106.31

Specimen Identification		D100	D50	D15	D10	%Gravel	%Sand	%Silt	%Clay
● Lab No. 11184	0.0	50	14.378	0.049	0.032	63.2	16.9	16.2	3.7
⊠ Lab No. 11185	0.0	50	0.98	0.003		41.0	17.6	27.3	14.1
▲ Lab No. 11186	0.0	75	6.279	0.125	0.065	56.4	32.6	8.9	2.0
★ Lab No. 11195	0.0	75	1.561	0.027	0.012	49.2	24.2	21.5	5.0
⊙ Lab No. 11196	0.0	50	0.136	0.015	0.003	30.0	30.9	30.6	8.5

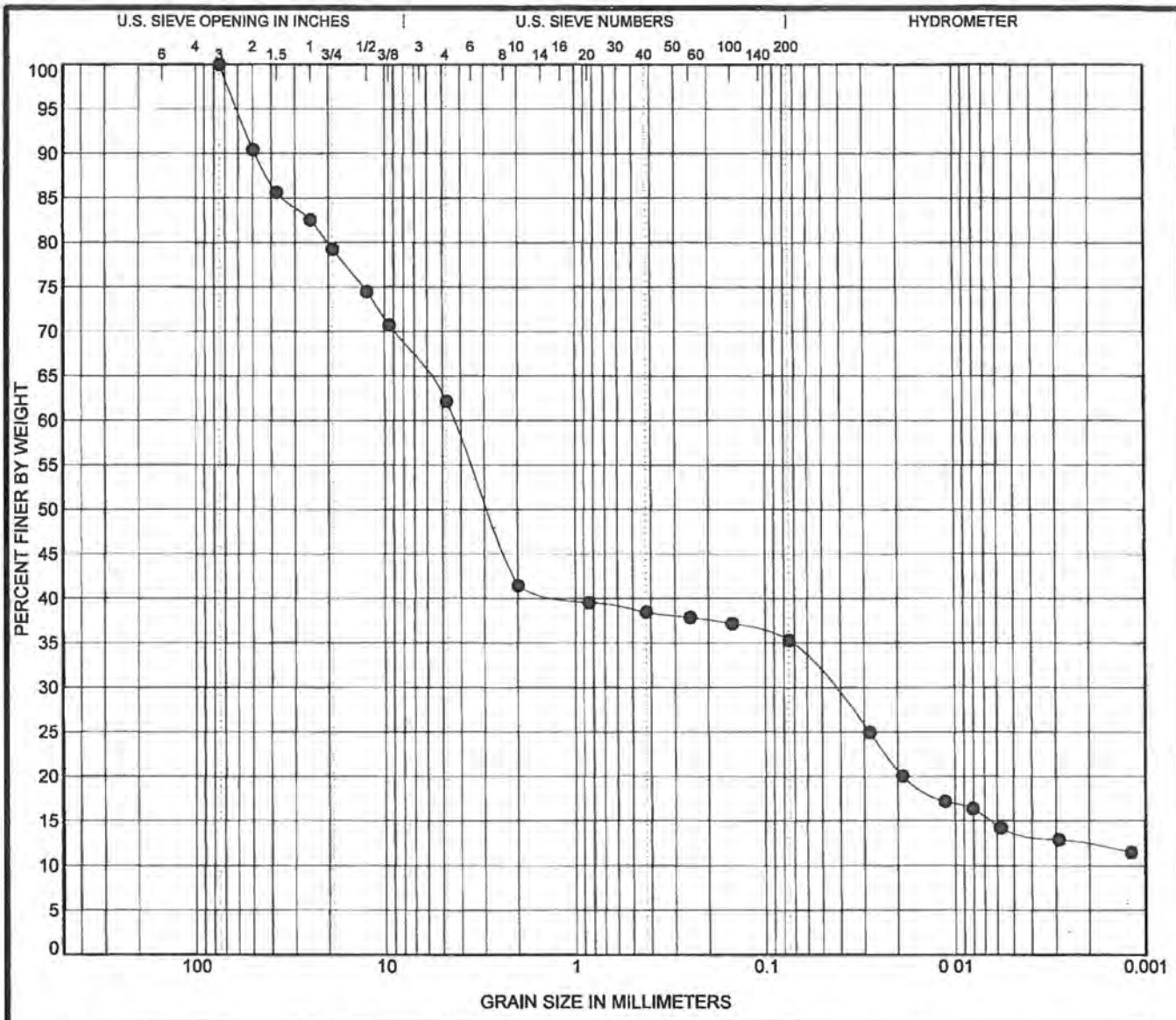
PIONEER TECHNICAL SERVICES, INC.

GRAIN SIZE DISTRIBUTION

Project: Black Pine Mine

Number: 15689

US GRAIN SIZE ASTM BLACK PINE MINE - 15689.GPJ PIONEER.GDT 9/16/11



COBBLES	GRAVEL		SAND			SILT OR CLAY
	coarse	fine	coarse	medium	fine	

	Specimen Identification	Classification	LL	PL	PI	Cc	Cu
●	**Lab No. 11197 0.0**	**CLAYEY GRAVEL with SAND(GC)**	**35**	**14**	**21**		

	Specimen Identification	D100	D50	D15	D10	%Gravel	%Sand	%Silt	%Clay
●	**Lab No. 11197 0.0**	**75**	**2.857**	**0.007**		**37.8**	**26.9**	**23.0**	**12.3**

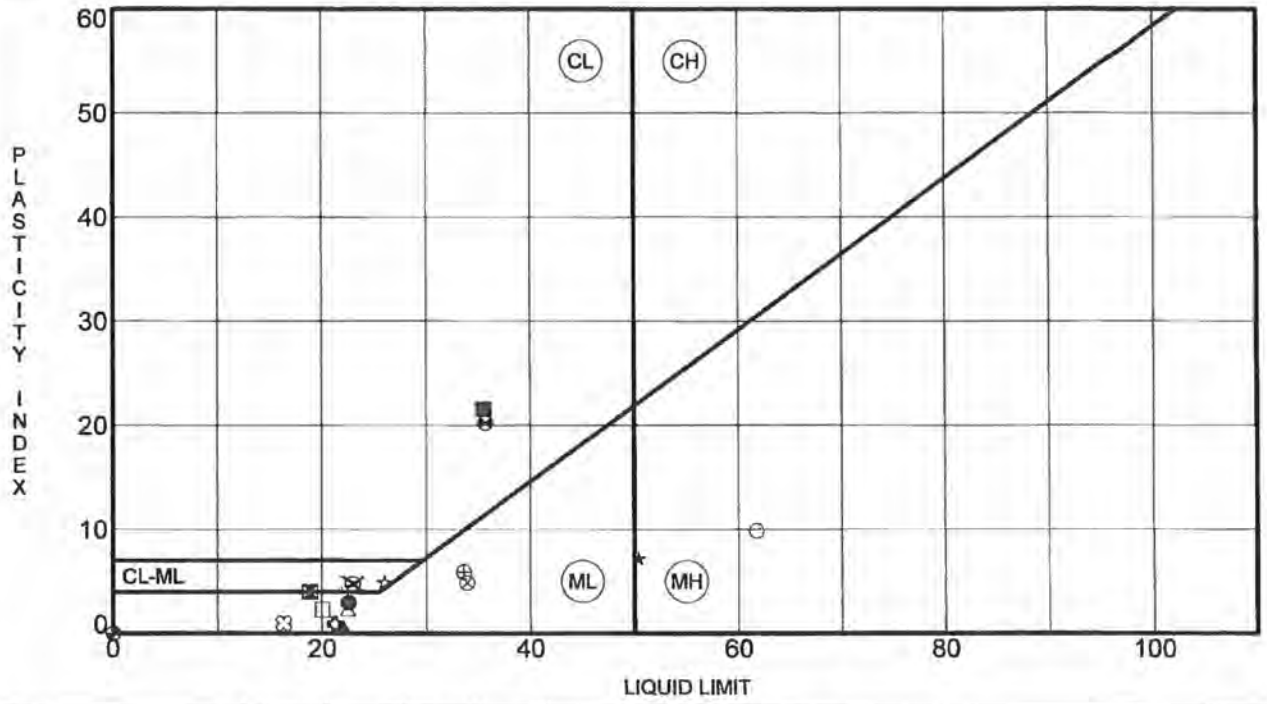
PIONEER TECHNICAL SERVICES, INC.

GRAIN SIZE DISTRIBUTION

Project: Black Pine Mine

Number: 15689

US GRAIN SIZE ASTM BLACK PINE MINE - 15689.GPJ PIONEER.GDT 9/16/11



	Specimen	Depth	LL	PL	PI	Fines	Classification
●	Lab No. 11174	2.7	23	20	3	5	WELL-GRADED GRAVEL with SILT and SAND(GW-GM)
⊠	Lab No. 11175	8.0	19	15	4	39	SILTY, CLAYEY GRAVEL with SAND(GC-GM)
▲	Lab No. 11176	1.5	22	21	1	30	SILTY GRAVEL(GM)
★	Lab No. 11177	1.5	50	43	7	17	SILTY GRAVEL(GM)
⊖	~~Lab No. 11178~~	~~13.0~~	~~23~~	~~18~~	~~5~~	~~19~~	
✿	Lab No. 11179	5.0	21	20	1	2	WELL-GRADED GRAVEL(GW)
○	Lab No. 11180	0.5	62	52	10	7	WELL-GRADED GRAVEL with SILT(GW-GM)
△	Lab No. 11181	1.5	22	20	2	7	WELL-GRADED GRAVEL with SILT(GW-GM)
⊗	Lab No. 11182	1.3	34	29	5	17	SILTY GRAVEL with SAND(GM)
⊕	Lab No. 11183	2.7	34	28	6	14	SILTY GRAVEL(GM)
□	Lab No. 11184	0.0	20	18	2	20	SILTY GRAVEL with SAND(GM)
⊖	Lab No. 11185	0.0	36	15	21	41	CLAYEY GRAVEL with SAND(GC)
◕	Lab No. 11186	0.0	NP	NP	NP	11	WELL-GRADED GRAVEL with SILT and SAND(GW-GM)
☆	Lab No. 11195	0.0	26	21	5	27	SILTY, CLAYEY GRAVEL with SAND(GC-GM)
⊠	Lab No. 11196	0.0	16	15	1	39	SILTY SAND with GRAVEL(SM)
■	Lab No. 11197	0.0	35	14	21	35	CLAYEY GRAVEL with SAND(GC)

PIONEER TECHNICAL SERVICES, INC.

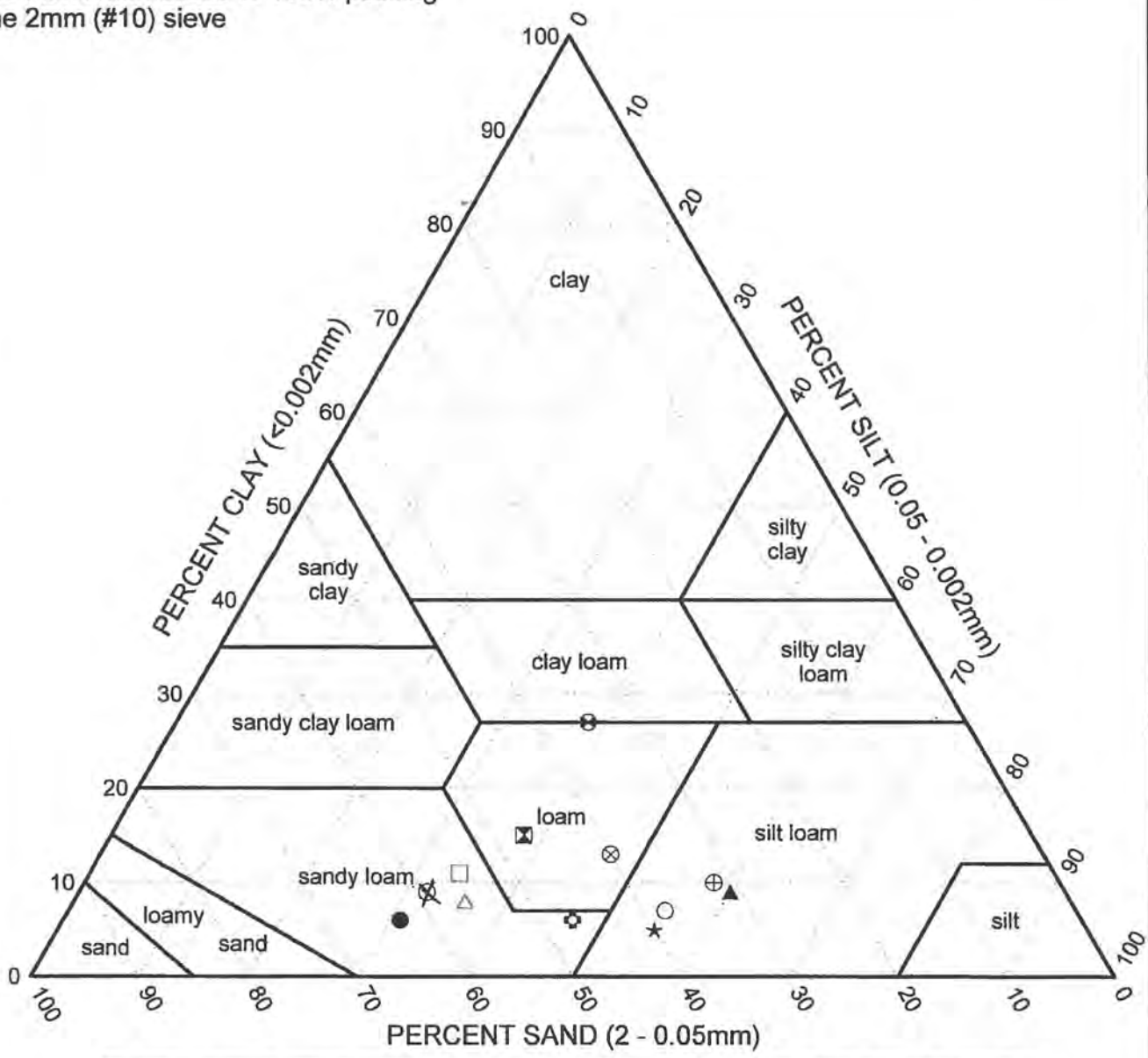
ATTERBERG LIMITS' RESULTS

Project: Black Pine Mine

Number: 15689

US ATTERBERG LIMITS BLACK PINE MINE - 15689.GPJ PIONEER.GDT 9/16/11

Fractions normalized to 100% passing the 2mm (#10) sieve



	Borehole	Depth (ft)	USDA Classification	Sand (%)	Silt (%)	Clay (%)
●	Lab No. 11174	2.7	SANDY LOAM	62.5	31.2	6.3
⊠	Lab No. 11175	8.0	LOAM	47.0	38.2	14.8
▲	Lab No. 11176	1.5	SILT LOAM	30.6	60.0	9.4
★	Lab No. 11177	1.5	SILT LOAM	40.2	54.4	5.4
⊖	~~Lab No. 11178~~	~~13.0~~	~~SANDY LOAM~~	~~58.6~~	~~32.1~~	~~9.4~~
✿	Lab No. 11179	5.0	SANDY LOAM	47.1	46.9	6.0
○	Lab No. 11180	0.5	SILT LOAM	38.1	54.9	7.0
△	Lab No. 11181	1.5	SANDY LOAM	55.9	36.4	7.7
⊗	Lab No. 11182	1.3	LOAM	39.8	47.3	12.9
⊕	Lab No. 11183	2.7	SILT LOAM	32.1	57.7	10.2
□	Lab No. 11184	0.0	SANDY LOAM	54.7	34.3	11.0
⊜	Lab No. 11185	0.0	CLAY LOAM	34.8	38.4	26.8

PIONEER TECHNICAL SERVICES, INC.

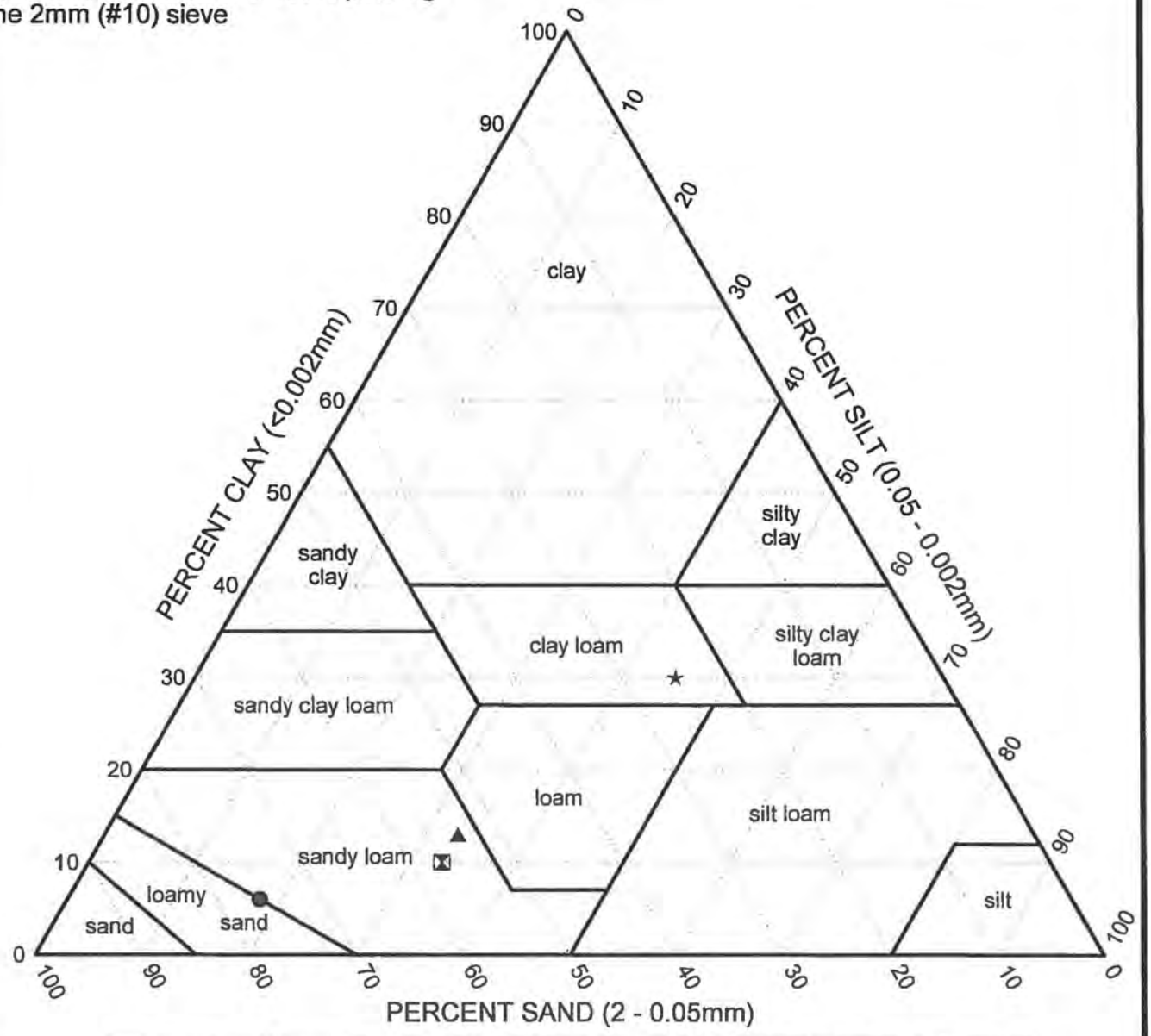
USDA Textural Classification Chart

Project: Black Pine Mine

Number: 15689

USDA TEXTURAL CLASSIFICATION BLACK PINE MINE - 15689.GPJ PIONEER.GDT 9/16/11

Fractions normalized to 100% passing the 2mm (#10) sieve



	Borehole	Depth (ft)	USDA Classification	Sand (%)	Silt (%)	Clay (%)
●	Lab No. 11186	0.0	SANDY LOAM	76.5	17.8	5.7
⊠	Lab No. 11195	0.0	SANDY LOAM	57.5	32.6	9.9
▲	Lab No. 11196	0.0	SANDY LOAM	54.0	33.0	13.0
★	Lab No. 11197	0.0	CLAY LOAM	25.2	45.2	29.7

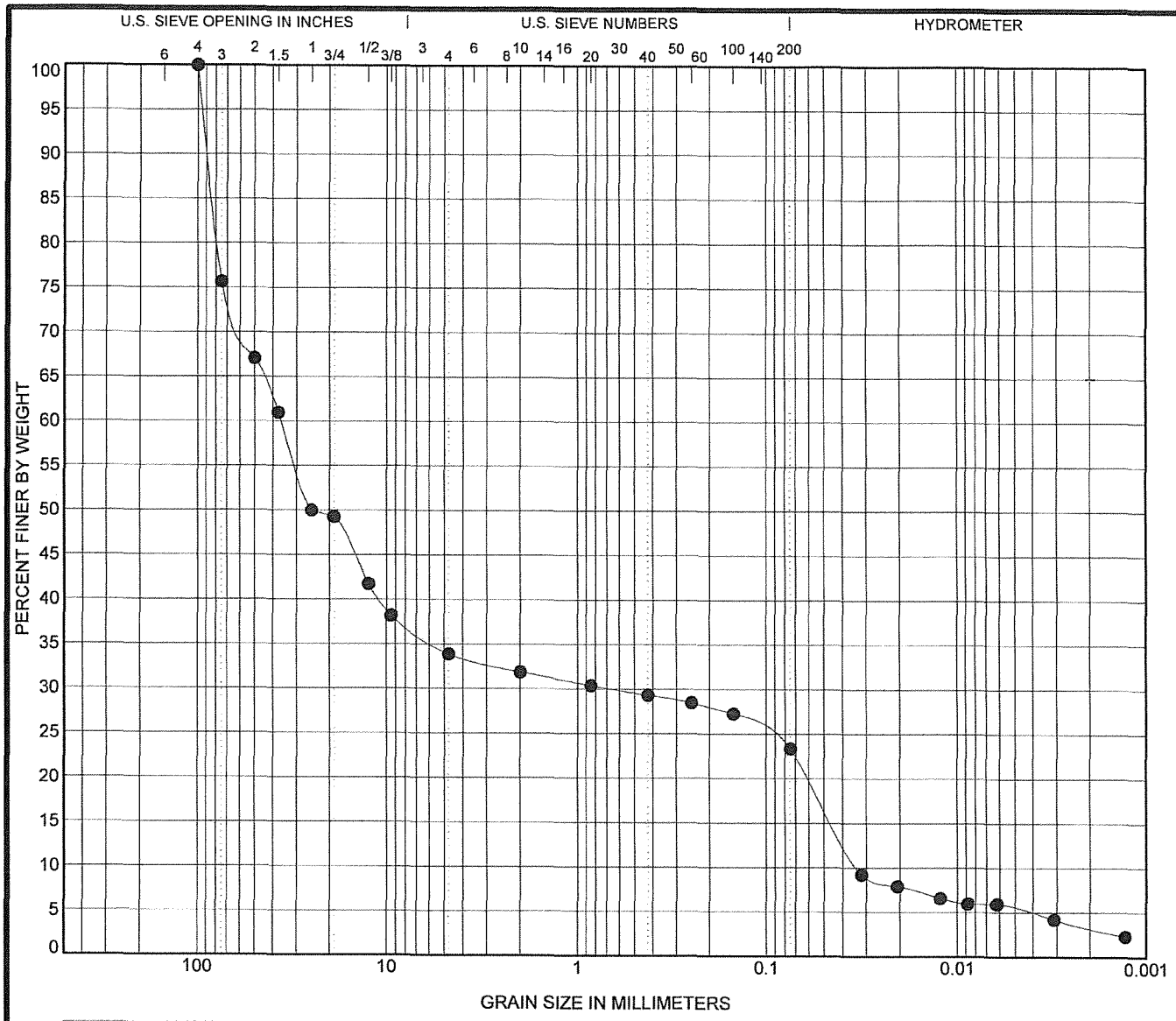
PIONEER TECHNICAL SERVICES, INC.

USDA Textural Classification Chart

Project: Black Pine Mine

Number: 15689

USDA TEXTURAL CLASSIFICATION BLACK PINE MINE - 15689.GPJ PIONEER.GDT 9/16/11



COBBLES	GRAVEL		SAND			SILT OR CLAY
	coarse	fine	coarse	medium	fine	

Specimen Identification	Classification	LL	PL	PI	Cc	Cu
● Lab No. 11178 13.0	SILTY, CLAYEY GRAVEL(GC-GM)	23	18	5	0.35	1082.36

Specimen Identification	D100	D50	D15	D10	%Gravel	%Sand	%Silt	%Clay
● Lab No. 11178 13.0	100	25.001	0.045	0.033	41.8	10.5	20.1	3.3

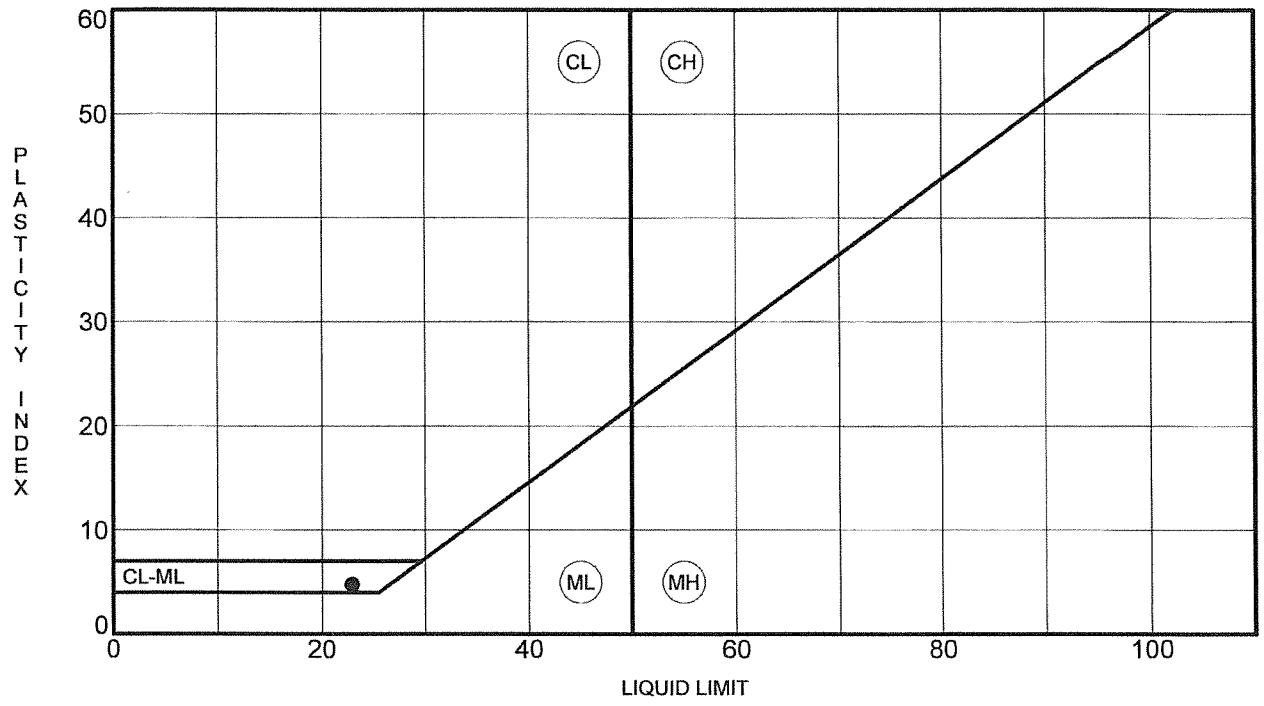
PIONEER TECHNICAL SERVICES, INC.

GRAIN SIZE DISTRIBUTION

Project: Black Pine Mine

Number: 15689

US GRAIN SIZE ASTM BLACK PINE MINE - 15689.GPJ PIONEER.GDT 9/27/11



	Specimen	Depth	LL	PL	PI	Fines	Classification
●	**Lab No. 11178**	**13.0**	**23**	**18**	**5**	**23**	**SILTY, CLAYEY GRAVEL(GC-GM)**

PIONEER TECHNICAL SERVICES, INC.

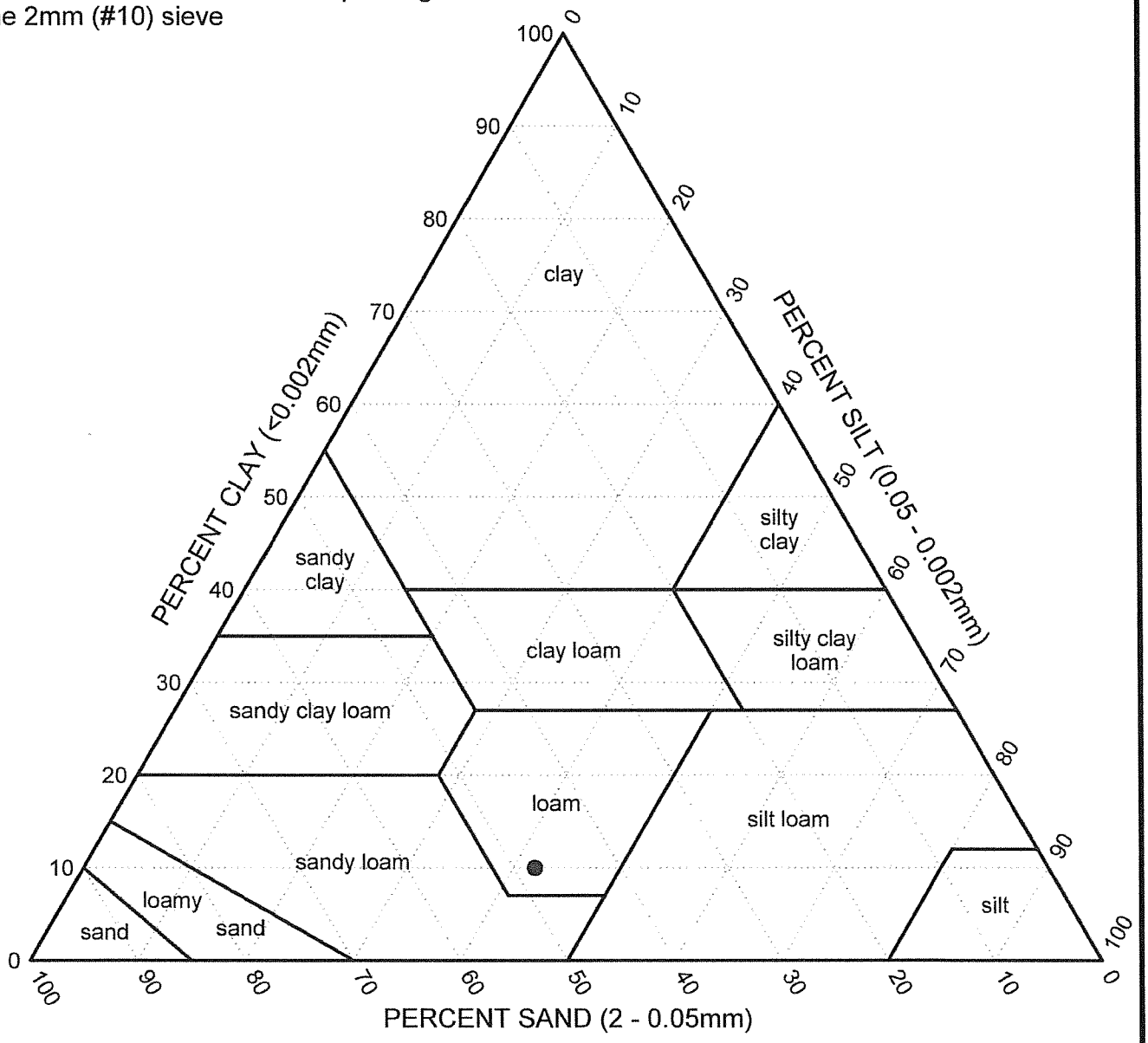
ATTERBERG LIMITS' RESULTS

Project: Black Pine Mine

Number: 15689

US ATTERBERG LIMITS BLACK PINE MINE - 15689.GPJ PIONEER.GDT 9/27/11

Fractions normalized to 100% passing the 2mm (#10) sieve



	Borehole	Depth (ft)	USDA Classification	Sand (%)	Silt (%)	Clay (%)
●	**Lab No. 11178**	**13.0**	**LOAM**	**47.8**	**42.0**	**10.2**

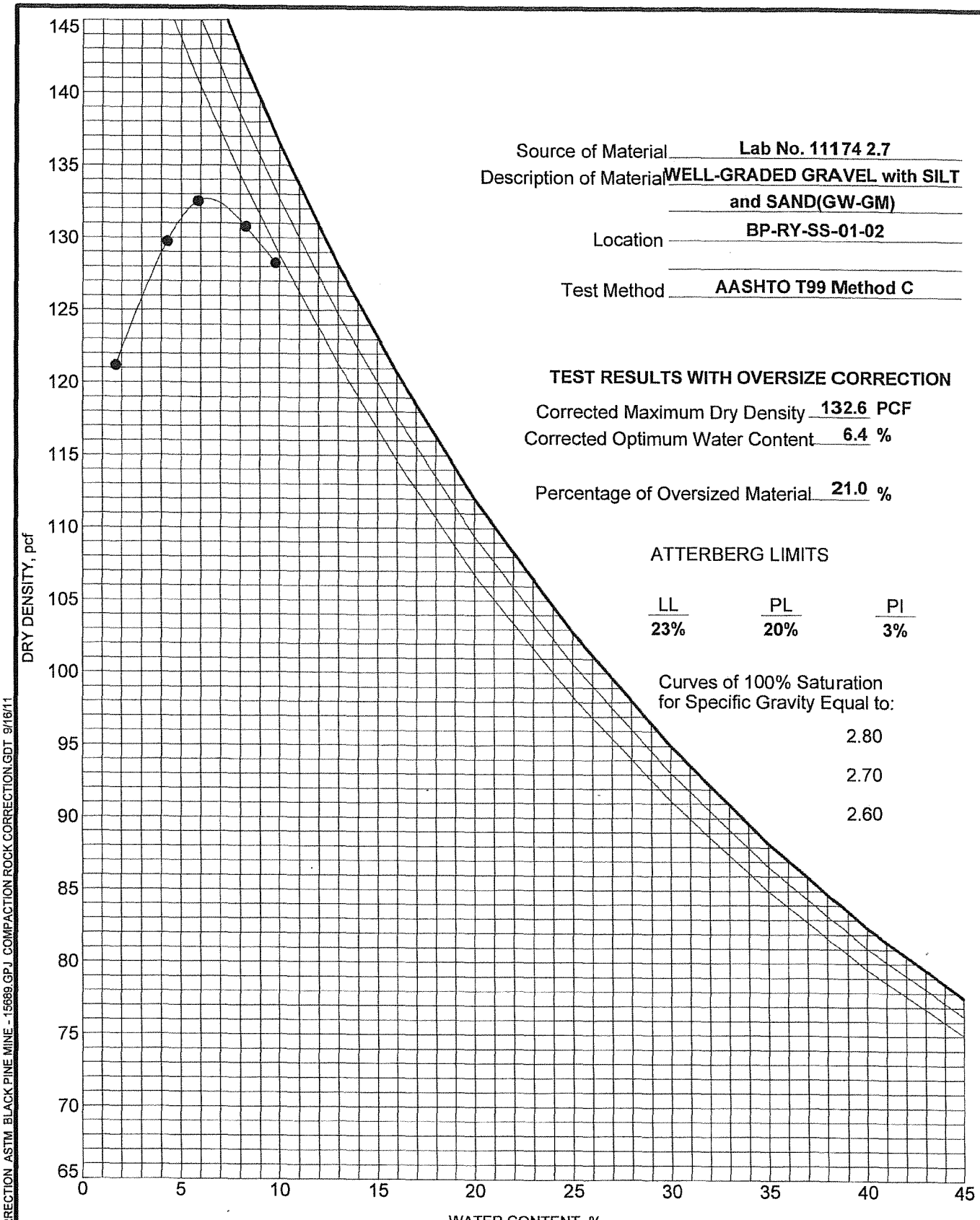
PIONEER TECHNICAL SERVICES, INC.

USDA Textural Classification Chart

Project: Black Pine Mine

Number: 15689

USDA TEXTURAL CLASSIFICATION BLACK PINE MINE - 15689.GPJ PIONEER.GDT 9/27/11



Source of Material: Lab No. 11174 2.7

Description of Material: WELL-GRADED GRAVEL with SILT and SAND(GW-GM)

Location: BP-RY-SS-01-02

Test Method: AASHTO T99 Method C

TEST RESULTS WITH OVERSIZE CORRECTION

Corrected Maximum Dry Density: 132.6 PCF

Corrected Optimum Water Content: 6.4 %

Percentage of Oversized Material: 21.0 %

ATTERBERG LIMITS

LL	PL	PI
23%	20%	3%

Curves of 100% Saturation for Specific Gravity Equal to:

2.80

2.70

2.60

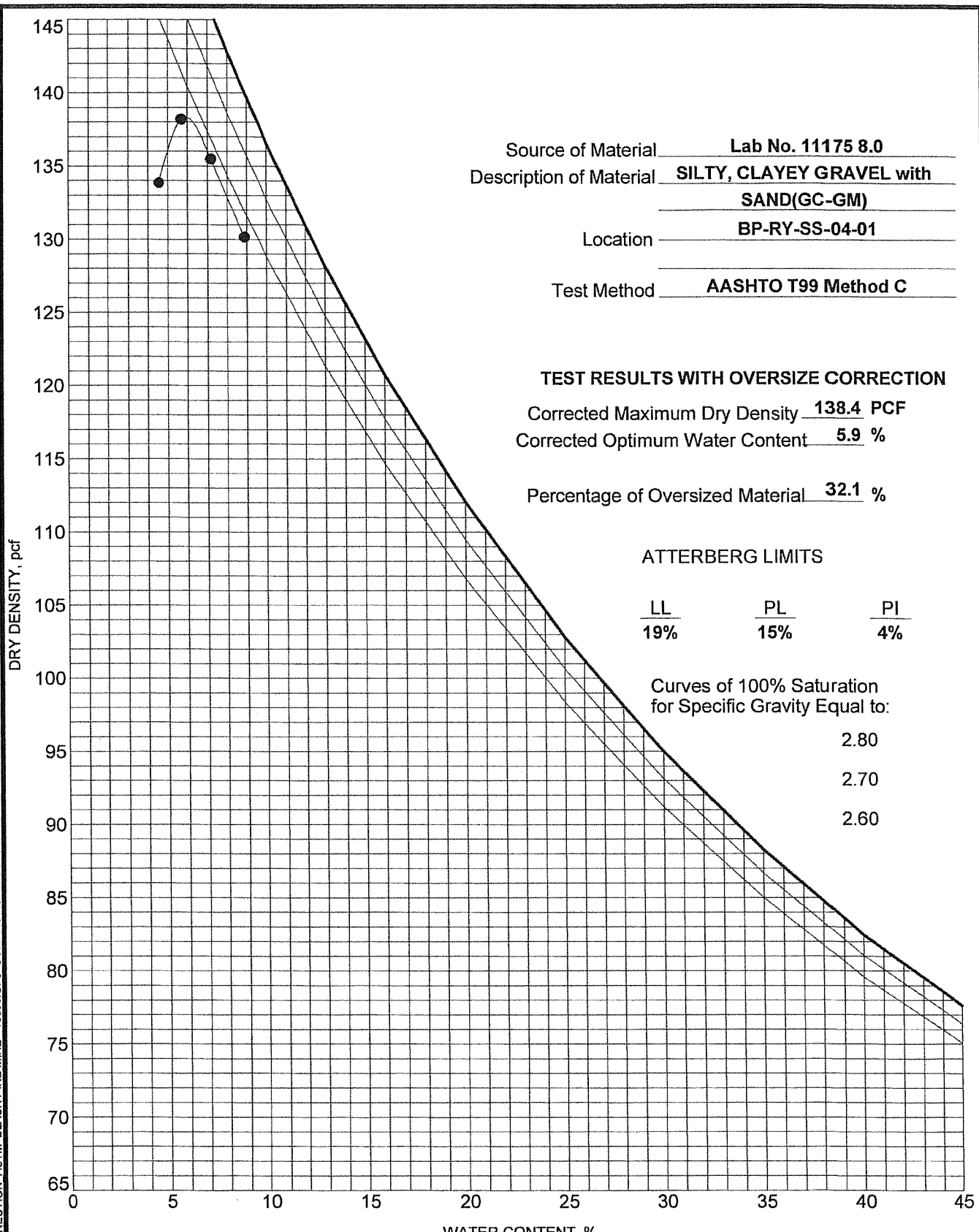
PIONEER TECHNICAL SERVICES, INC.

MOISTURE-DENSITY RELATIONSHIP

Project: Black Pine Mine

Number: 15689

COMPACTION_ROCK CORRECTION_ASTM_BLACK PINE MINE - 15689.GPJ_COMPACTION ROCK CORRECTION.GDT 9/16/11



Source of Material: **Lab No. 11175 8.0**

Description of Material: **SILTY, CLAYEY GRAVEL with SAND(GC-GM)**

Location: **BP-RY-SS-04-01**

Test Method: **AASHTO T99 Method C**

TEST RESULTS WITH OVERSIZE CORRECTION

Corrected Maximum Dry Density: **138.4** PCF

Corrected Optimum Water Content: **5.9** %

Percentage of Oversized Material: **32.1** %

ATTERBERG LIMITS

LL	PL	PI
19%	15%	4%

Curves of 100% Saturation for Specific Gravity Equal to:

2.80

2.70

2.60

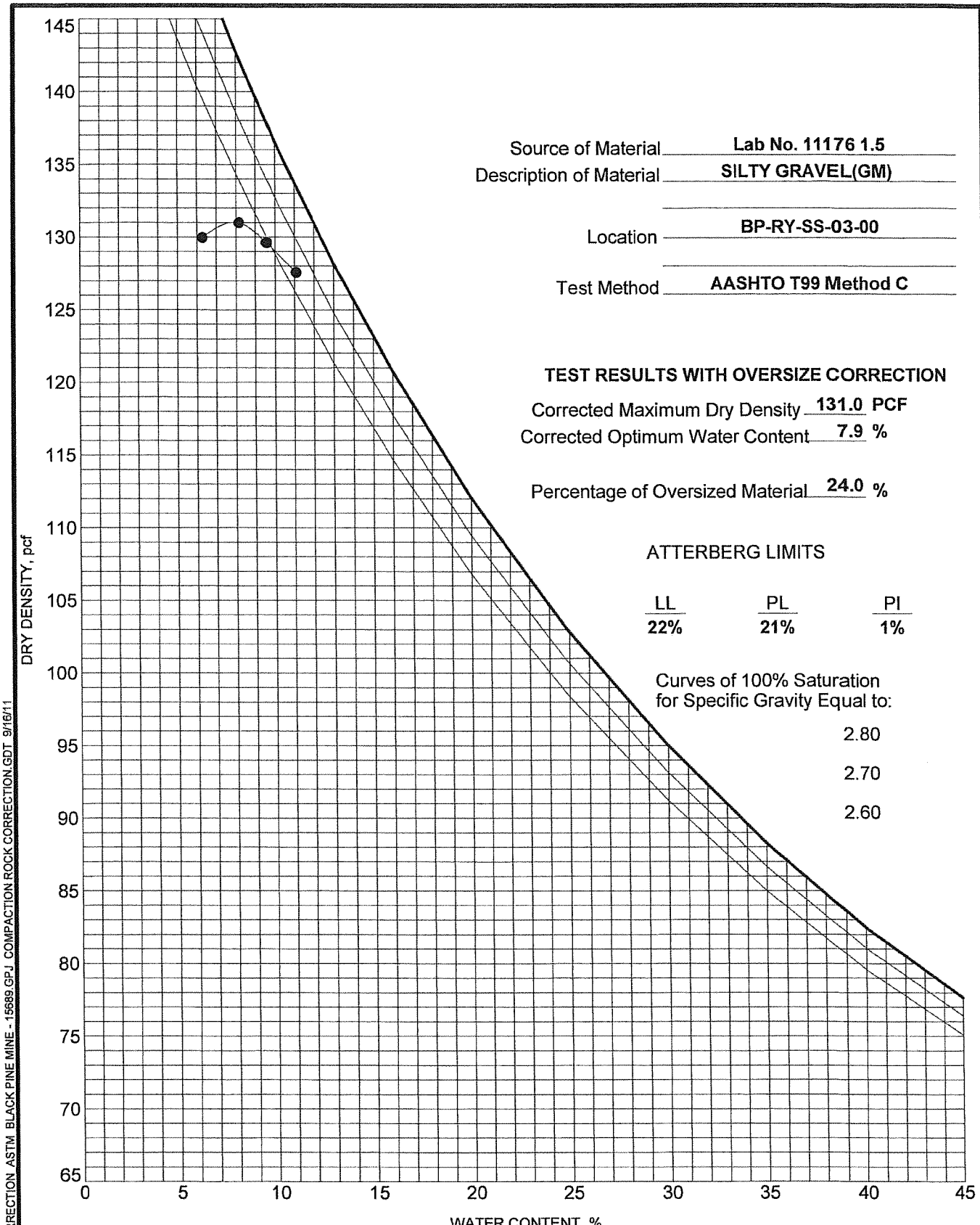
COMPACTION ROCK CORRECTION ASTM BLACK PINE MINE - 15689.GPJ COMPACTION ROCK CORRECTION.GDT 9/16/11

PIONEER TECHNICAL SERVICES, INC.

MOISTURE-DENSITY RELATIONSHIP

Project: Black Pine Mine

Number: 15689



Source of Material: Lab No. 11176 1.5

Description of Material: SILTY GRAVEL(GM)

Location: BP-RY-SS-03-00

Test Method: AASHTO T99 Method C

TEST RESULTS WITH OVERSIZE CORRECTION

Corrected Maximum Dry Density: 131.0 PCF

Corrected Optimum Water Content: 7.9 %

Percentage of Oversized Material: 24.0 %

ATTERBERG LIMITS

LL	PL	PI
22%	21%	1%

Curves of 100% Saturation for Specific Gravity Equal to:

2.80

2.70

2.60

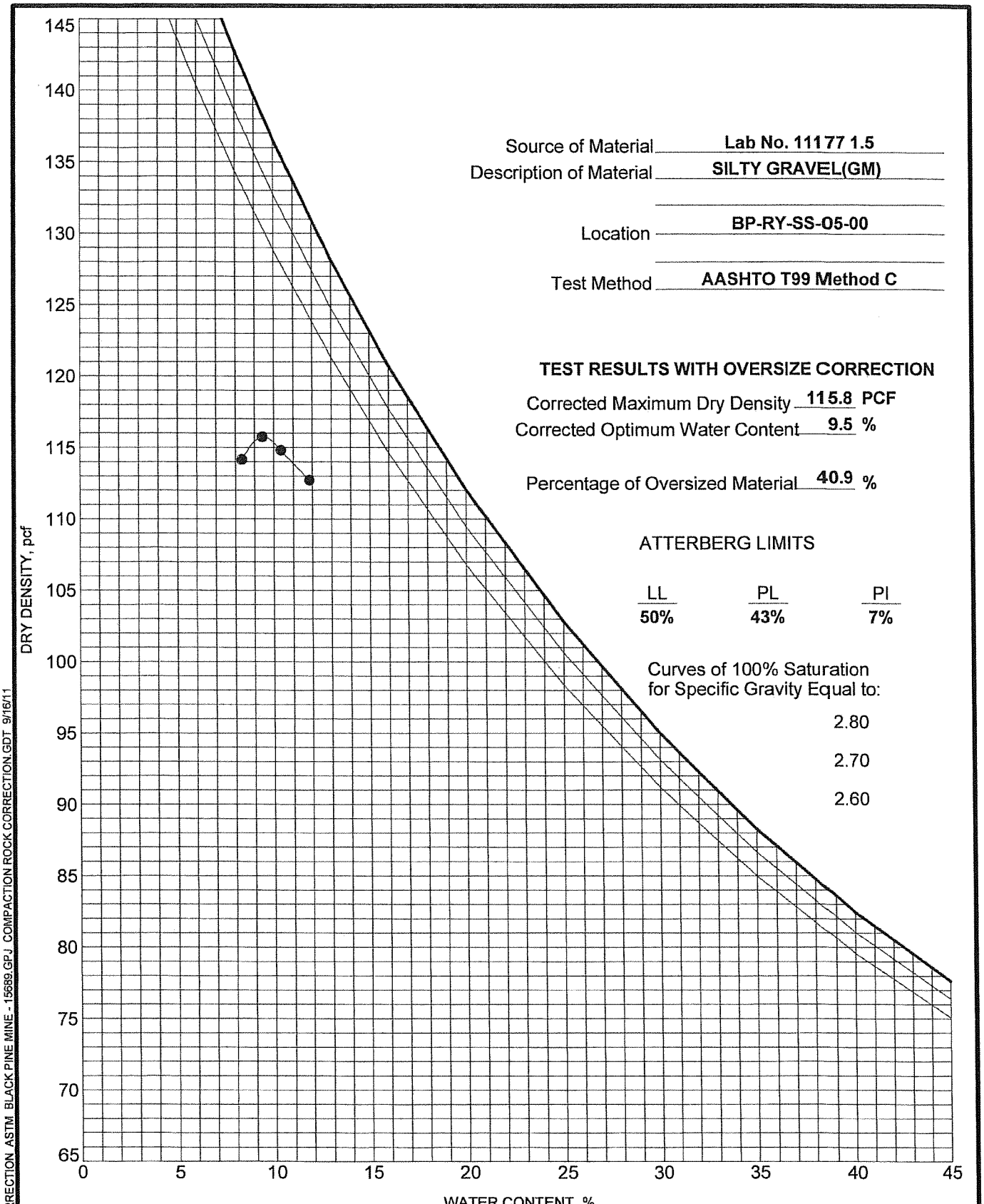
PIONEER TECHNICAL SERVICES, INC.

MOISTURE-DENSITY RELATIONSHIP

Project: Black Pine Mine

Number: 15689

COMPACTION ROCK CORRECTION ASTM BLACK PINE MINE - 15689.GPJ COMPACTION ROCK CORRECTION.GDT 9/16/11



Source of Material: Lab No. 11177 1.5

Description of Material: SILTY GRAVEL(GM)

Location: BP-RY-SS-05-00

Test Method: AASHTO T99 Method C

TEST RESULTS WITH OVERSIZE CORRECTION

Corrected Maximum Dry Density: 115.8 PCF

Corrected Optimum Water Content: 9.5 %

Percentage of Oversized Material: 40.9 %

ATTERBERG LIMITS

LL	PL	PI
50%	43%	7%

Curves of 100% Saturation for Specific Gravity Equal to:

2.80

2.70

2.60

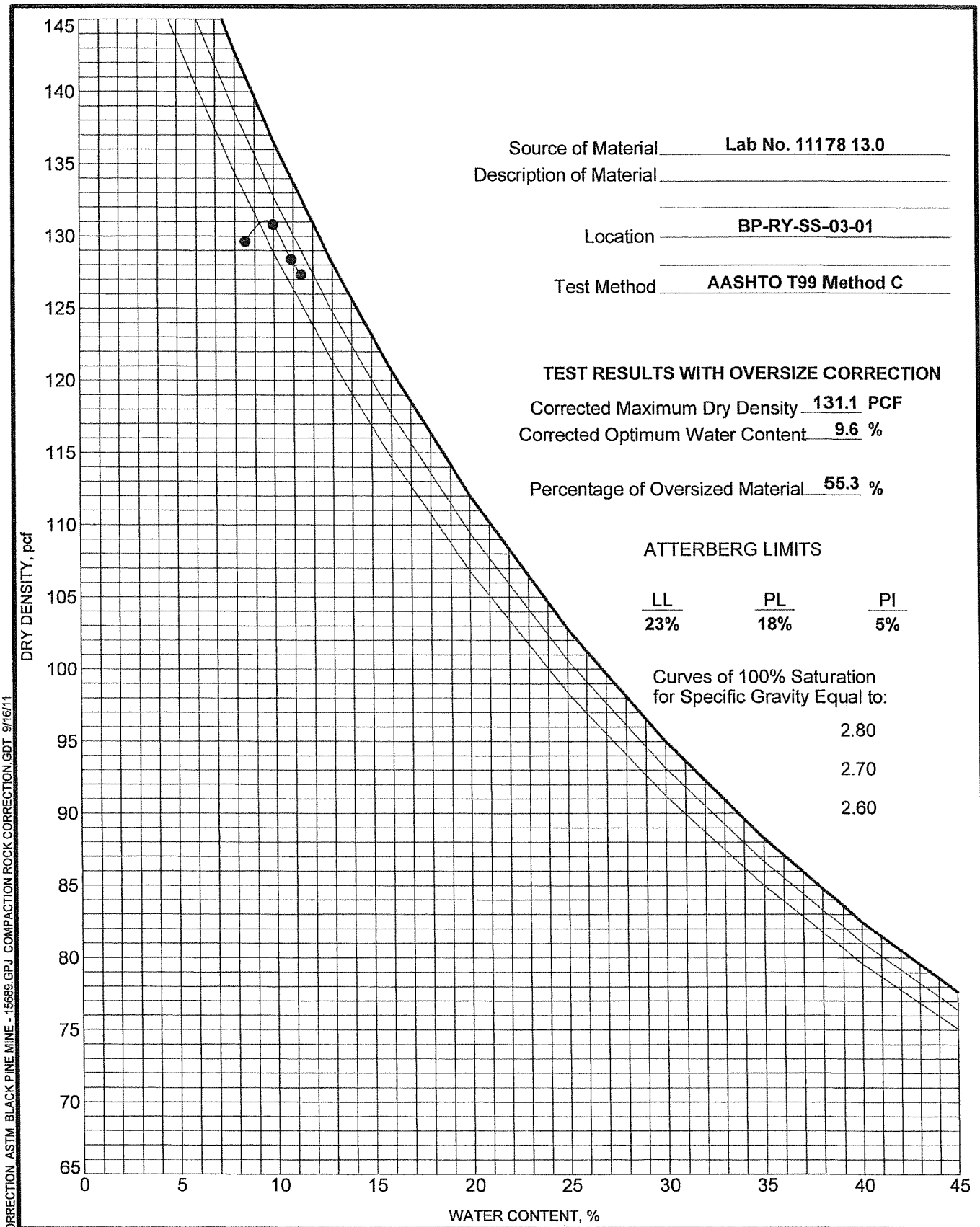
PIONEER TECHNICAL SERVICES, INC.

MOISTURE-DENSITY RELATIONSHIP

Project: Black Pine Mine

Number: 15689

COMPACTION ROCK CORRECTION ASTM BLACK PINE MINE - 15689.GPJ COMPACTION ROCK CORRECTION.GDT 9/16/11



Source of Material: Lab No. 11178 13.0

Description of Material:

Location: BP-RY-SS-03-01

Test Method: AASHTO T99 Method C

TEST RESULTS WITH OVERSIZE CORRECTION

Corrected Maximum Dry Density: 131.1 PCF

Corrected Optimum Water Content: 9.6 %

Percentage of Oversized Material: 55.3 %

ATTERBERG LIMITS

LL	PL	PI
23%	18%	5%

Curves of 100% Saturation for Specific Gravity Equal to:

2.80

2.70

2.60

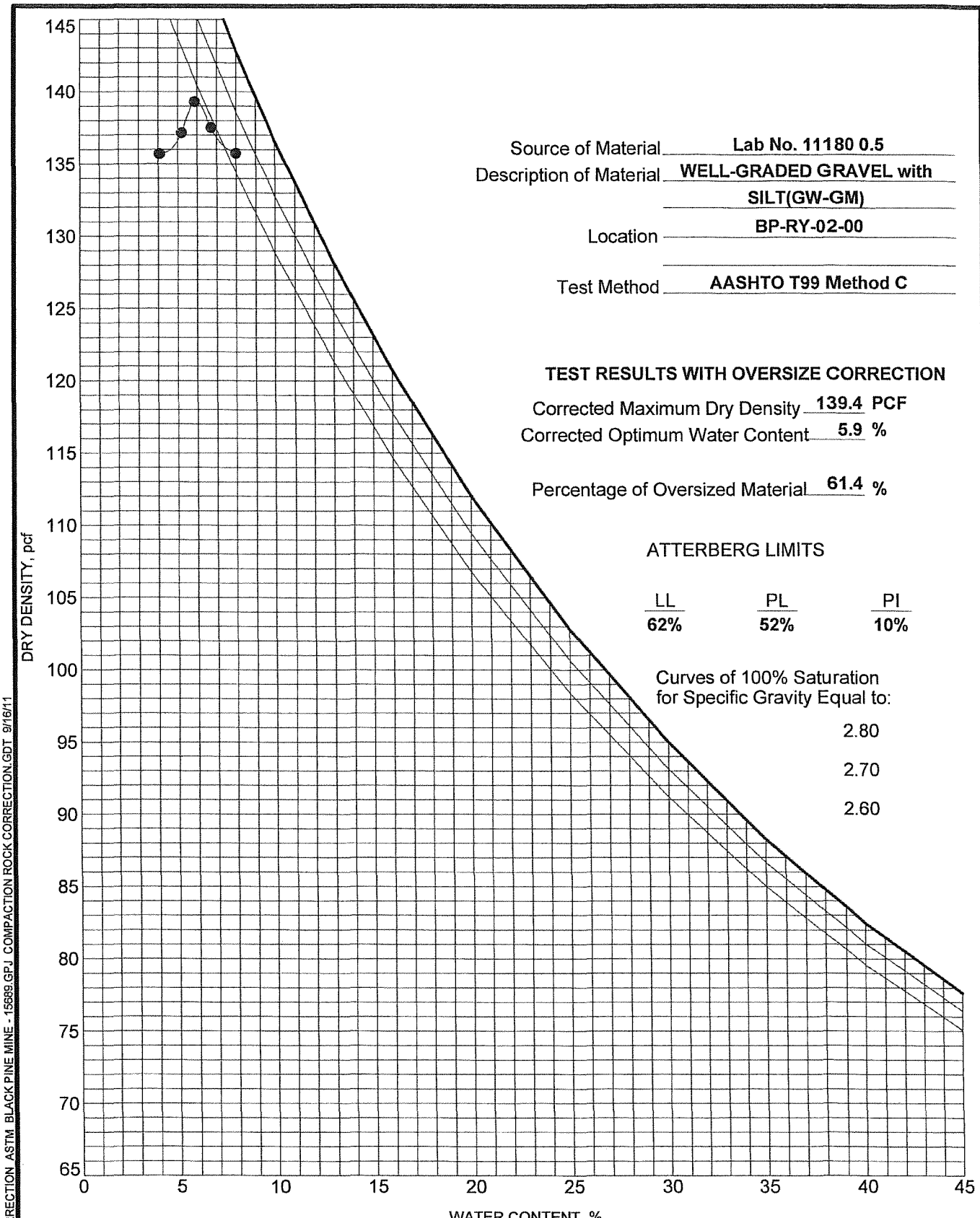
PIONEER TECHNICAL SERVICES, INC.

MOISTURE-DENSITY RELATIONSHIP

Project: Black Pine Mine

Number: 15689

COMPACTION ROCK CORRECTION ASTM BLACK PINE MINE - 15689.GPJ COMPACTION ROCK CORRECTION.GDT 9/16/11



Source of Material: Lab No. 11180 0.5

Description of Material: WELL-GRADED GRAVEL with SILT(GW-GM)

Location: BP-RY-02-00

Test Method: AASHTO T99 Method C

TEST RESULTS WITH OVERSIZE CORRECTION

Corrected Maximum Dry Density: 139.4 PCF

Corrected Optimum Water Content: 5.9 %

Percentage of Oversized Material: 61.4 %

ATTERBERG LIMITS

LL	PL	PI
62%	52%	10%

Curves of 100% Saturation for Specific Gravity Equal to:

2.80

2.70

2.60

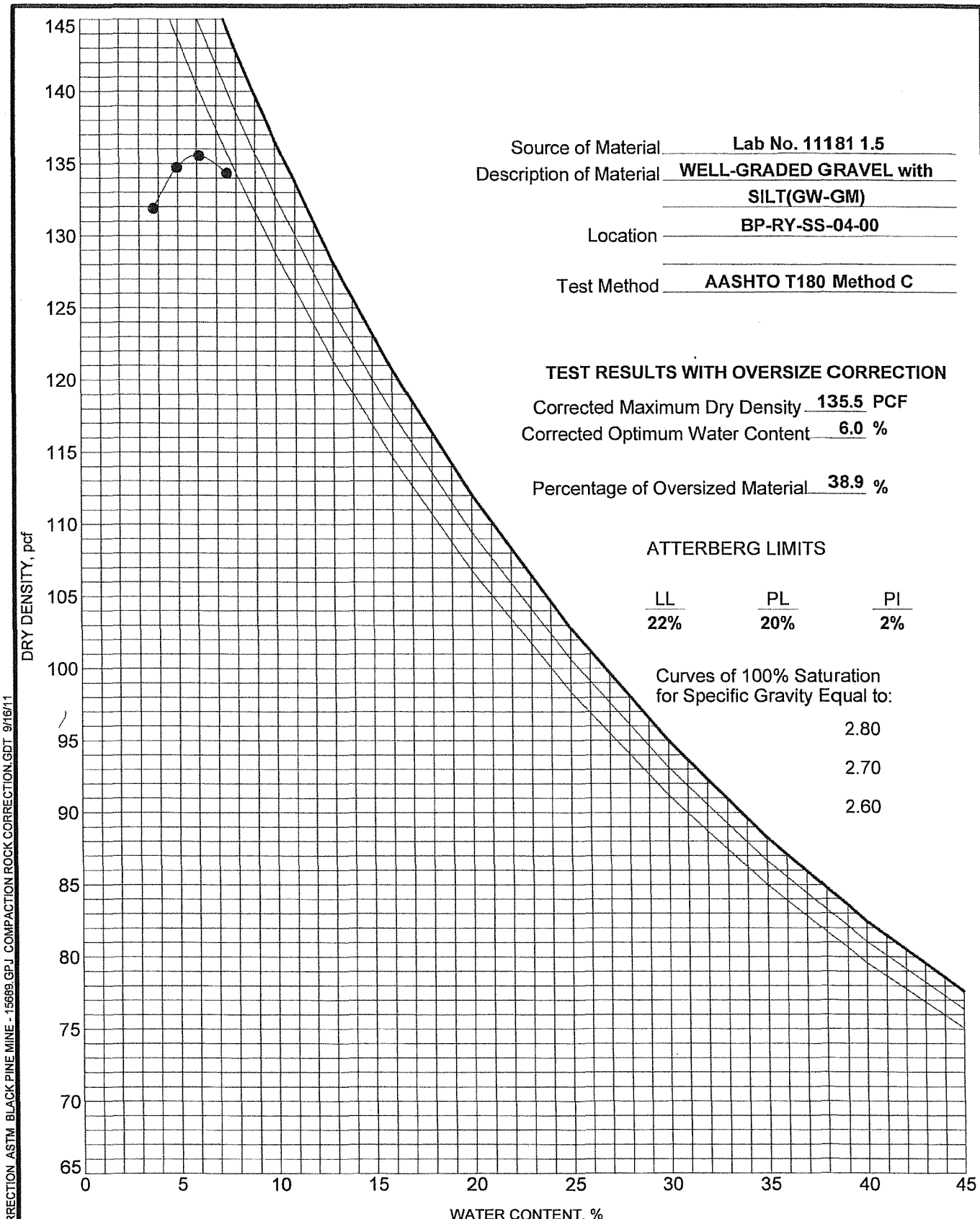
PIONEER TECHNICAL SERVICES, INC.

MOISTURE-DENSITY RELATIONSHIP

Project: Black Pine Mine

Number: 15689

COMPACTION ROCK CORRECTION ASTM BLACK PINE MINE - 15689.GPJ COMPACTION ROCK CORRECTION.GDT 9/16/11



Source of Material: Lab No. 11181 1.5

Description of Material: WELL-GRADED GRAVEL with SILT(GW-GM)

Location: BP-RY-SS-04-00

Test Method: AASHTO T180 Method C

TEST RESULTS WITH OVERSIZE CORRECTION

Corrected Maximum Dry Density: 135.5 PCF

Corrected Optimum Water Content: 6.0 %

Percentage of Oversized Material: 38.9 %

ATTERBERG LIMITS

LL	PL	PI
22%	20%	2%

Curves of 100% Saturation for Specific Gravity Equal to:

2.80

2.70

2.60

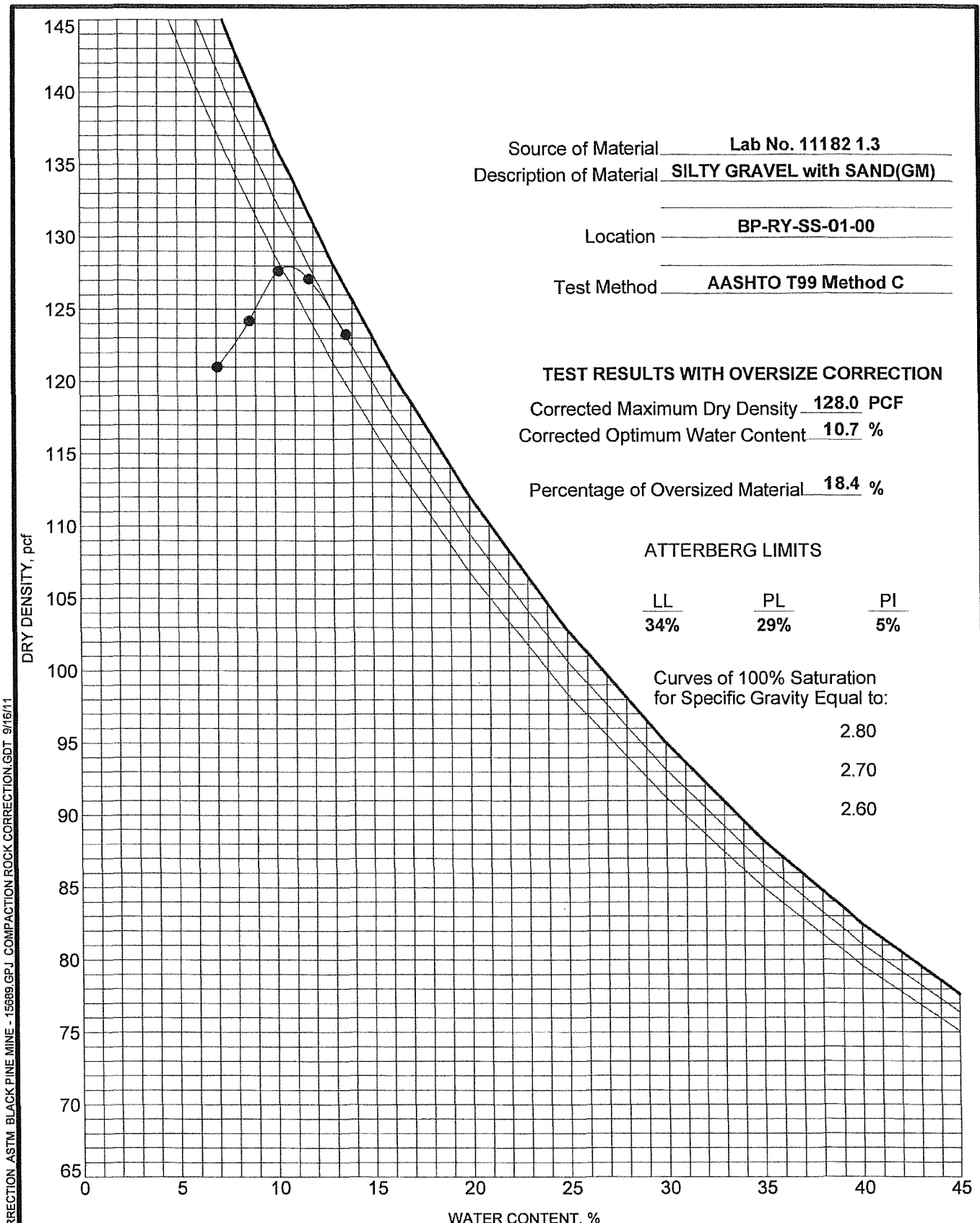
COMPACTION_ROCK_CORRECTION_ASTM_BLACK PINE MINE - 15689.GPJ_COMPACTION ROCK CORRECTION.GDT 9/16/11

PIONEER TECHNICAL SERVICES, INC.

MOISTURE-DENSITY RELATIONSHIP

Project: Black Pine Mine

Number: 15689



Source of Material: Lab No. 11182 1.3

Description of Material: SILTY GRAVEL with SAND(GM)

Location: BP-RY-SS-01-00

Test Method: AASHTO T99 Method C

TEST RESULTS WITH OVERSIZE CORRECTION

Corrected Maximum Dry Density: 128.0 PCF

Corrected Optimum Water Content: 10.7 %

Percentage of Oversized Material: 18.4 %

ATTERBERG LIMITS

LL	PL	PI
34%	29%	5%

Curves of 100% Saturation for Specific Gravity Equal to:

2.80

2.70

2.60

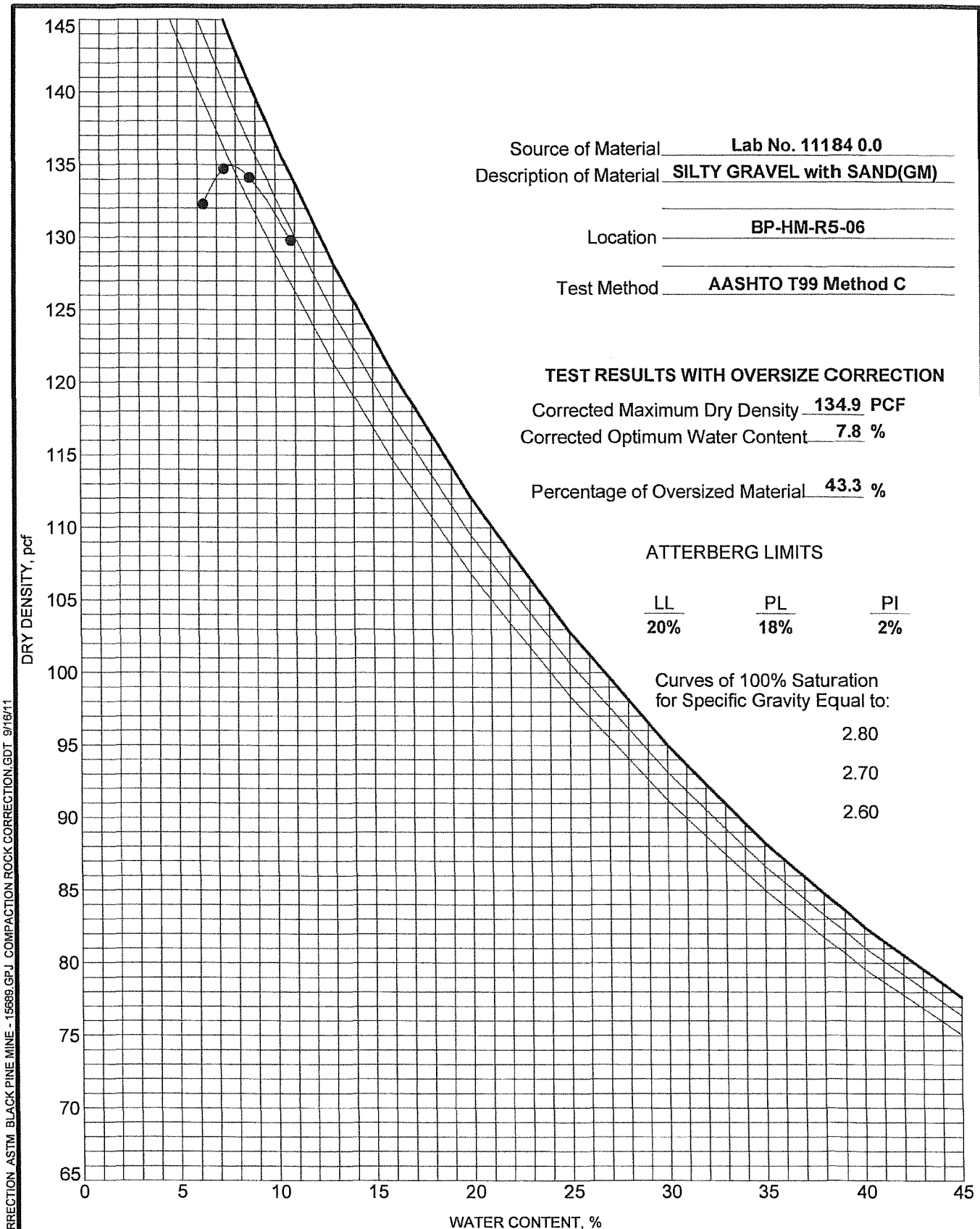
COMPACTION ROCK CORRECTION ASTM BLACK PINE MINE - 15689.GPJ COMPACTION ROCK CORRECTION.GDT 9/16/11

PIONEER TECHNICAL SERVICES, INC.

MOISTURE-DENSITY RELATIONSHIP

Project: Black Pine Mine

Number: 15689



Source of Material: Lab No. 11184 0.0

Description of Material: SILTY GRAVEL with SAND(GM)

Location: BP-HM-R5-06

Test Method: AASHTO T99 Method C

TEST RESULTS WITH OVERSIZE CORRECTION

Corrected Maximum Dry Density: 134.9 PCF

Corrected Optimum Water Content: 7.8 %

Percentage of Oversized Material: 43.3 %

ATTERBERG LIMITS

LL	PL	PI
20%	18%	2%

Curves of 100% Saturation for Specific Gravity Equal to:

2.80

2.70

2.60

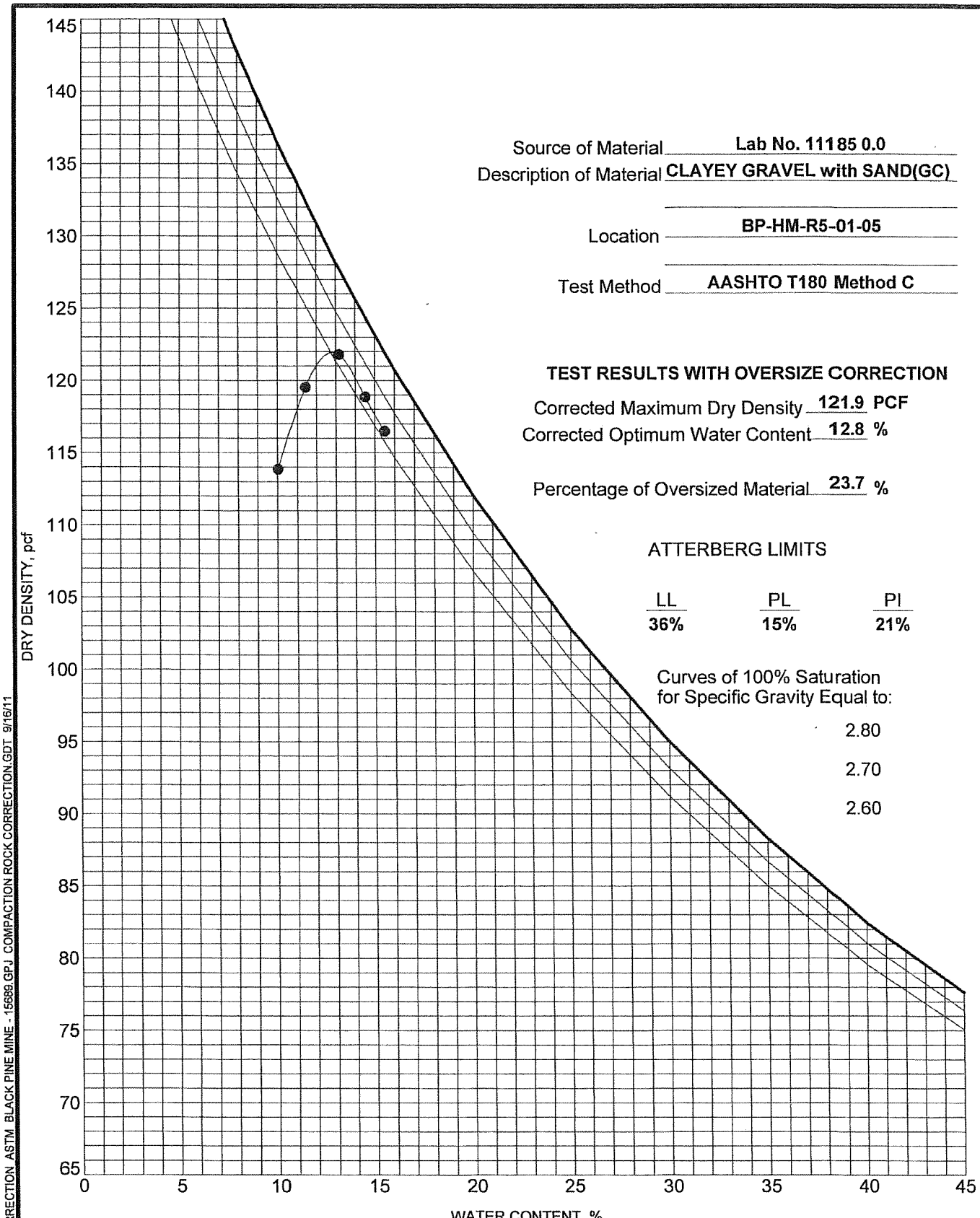
PIONEER TECHNICAL SERVICES, INC.

MOISTURE-DENSITY RELATIONSHIP

Project: Black Pine Mine

Number: 15689

COMPACTION_ROCK_CORRECTION_ASTM_BLACK PINE MINE - 15689.GPJ_COMPACTION ROCK CORRECTION.GDT 9/16/11



Source of Material: Lab No. 11185 0.0

Description of Material: CLAYEY GRAVEL with SAND(GC)

Location: BP-HM-R5-01-05

Test Method: AASHTO T180 Method C

TEST RESULTS WITH OVERSIZE CORRECTION

Corrected Maximum Dry Density: 121.9 PCF

Corrected Optimum Water Content: 12.8 %

Percentage of Oversized Material: 23.7 %

ATTERBERG LIMITS

LL	PL	PI
36%	15%	21%

Curves of 100% Saturation for Specific Gravity Equal to:

2.80

2.70

2.60

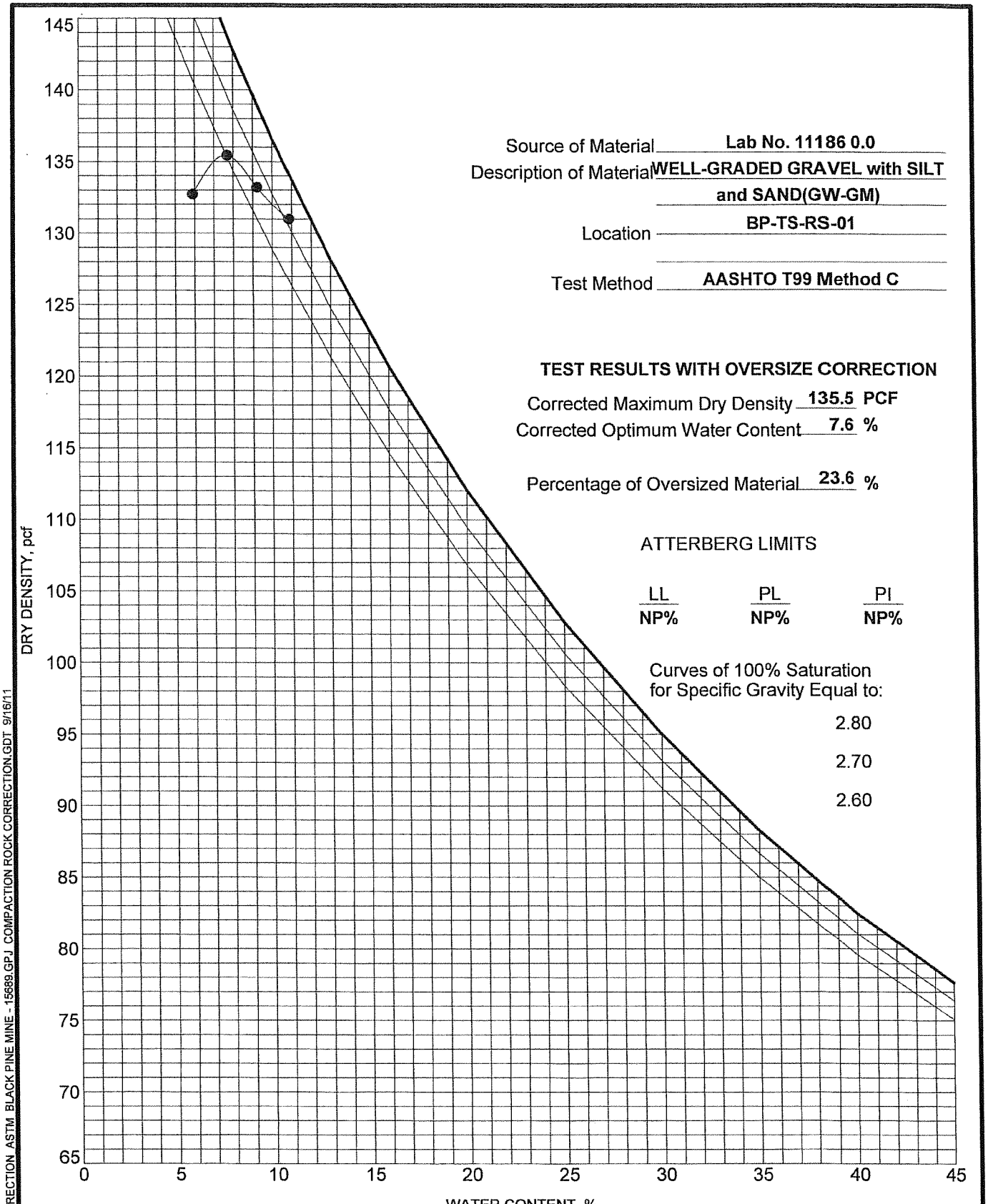
PIONEER TECHNICAL SERVICES, INC.

MOISTURE-DENSITY RELATIONSHIP

Project: Black Pine Mine

Number: 15689

COMPACTION ROCK CORRECTION ASTM BLACK PINE MINE - 15689.GPJ COMPACTION ROCK CORRECTION.GDT 9/16/11



Source of Material: Lab No. 11186 0.0

Description of Material: WELL-GRADED GRAVEL with SILT and SAND(GW-GM)

Location: BP-TS-RS-01

Test Method: AASHTO T99 Method C

TEST RESULTS WITH OVERSIZE CORRECTION

Corrected Maximum Dry Density: 135.5 PCF

Corrected Optimum Water Content: 7.6 %

Percentage of Oversized Material: 23.6 %

ATTERBERG LIMITS

LL	PL	PI
NP%	NP%	NP%

Curves of 100% Saturation for Specific Gravity Equal to:

2.80

2.70

2.60

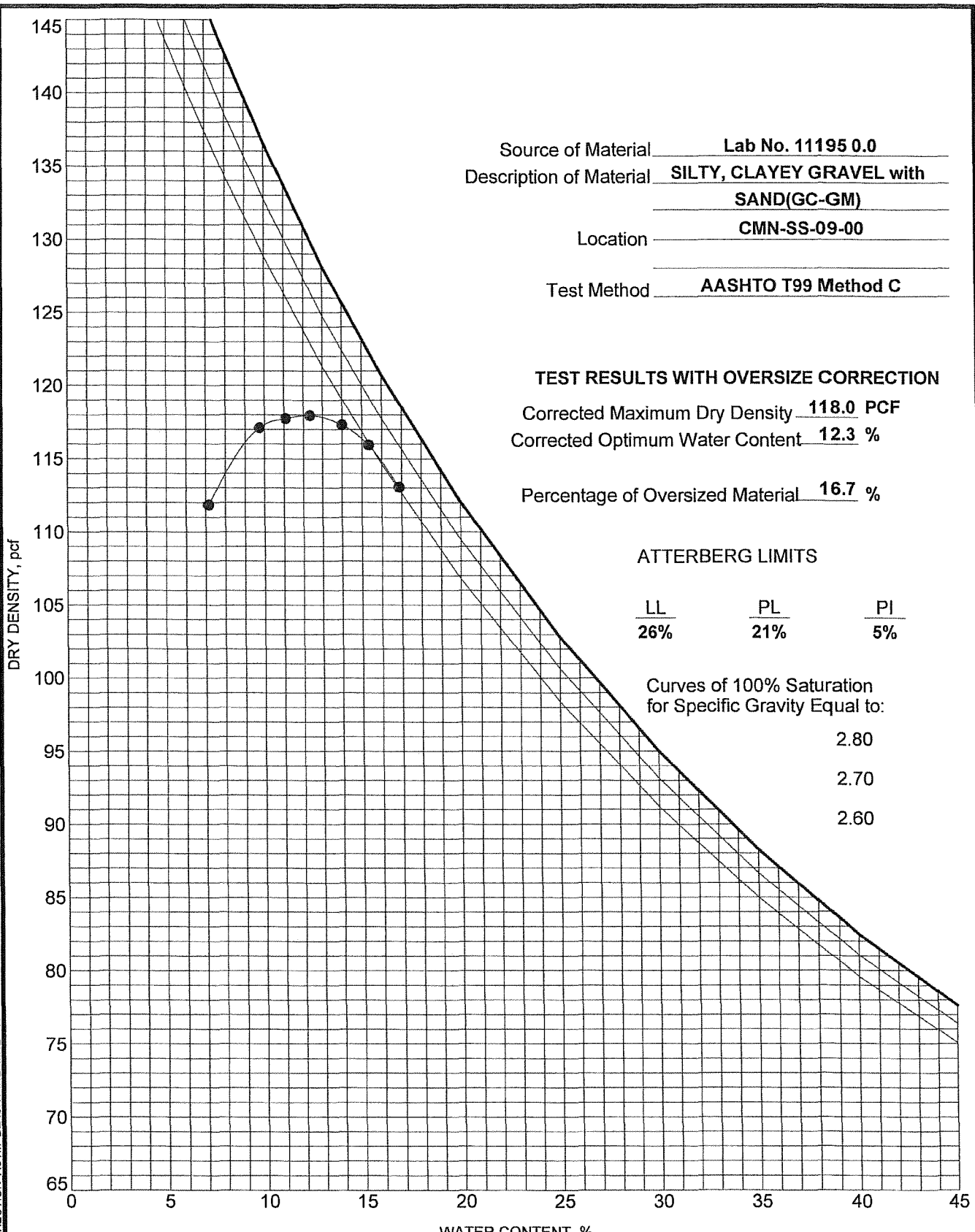
PIONEER TECHNICAL SERVICES, INC.

MOISTURE-DENSITY RELATIONSHIP

Project: Black Pine Mine

Number: 15689

COMPACTION ROCK CORRECTION ASTM BLACK PINE MINE - 15689.GPJ COMPACTION ROCK CORRECTION.GDT 9/16/11



Source of Material: Lab No. 11195 0.0

Description of Material: SILTY, CLAYEY GRAVEL with SAND(GC-GM)

Location: CMN-SS-09-00

Test Method: AASHTO T99 Method C

TEST RESULTS WITH OVERSIZE CORRECTION

Corrected Maximum Dry Density: 118.0 PCF

Corrected Optimum Water Content: 12.3 %

Percentage of Oversized Material: 16.7 %

ATTERBERG LIMITS

LL	PL	PI
26%	21%	5%

Curves of 100% Saturation for Specific Gravity Equal to:

2.80

2.70

2.60

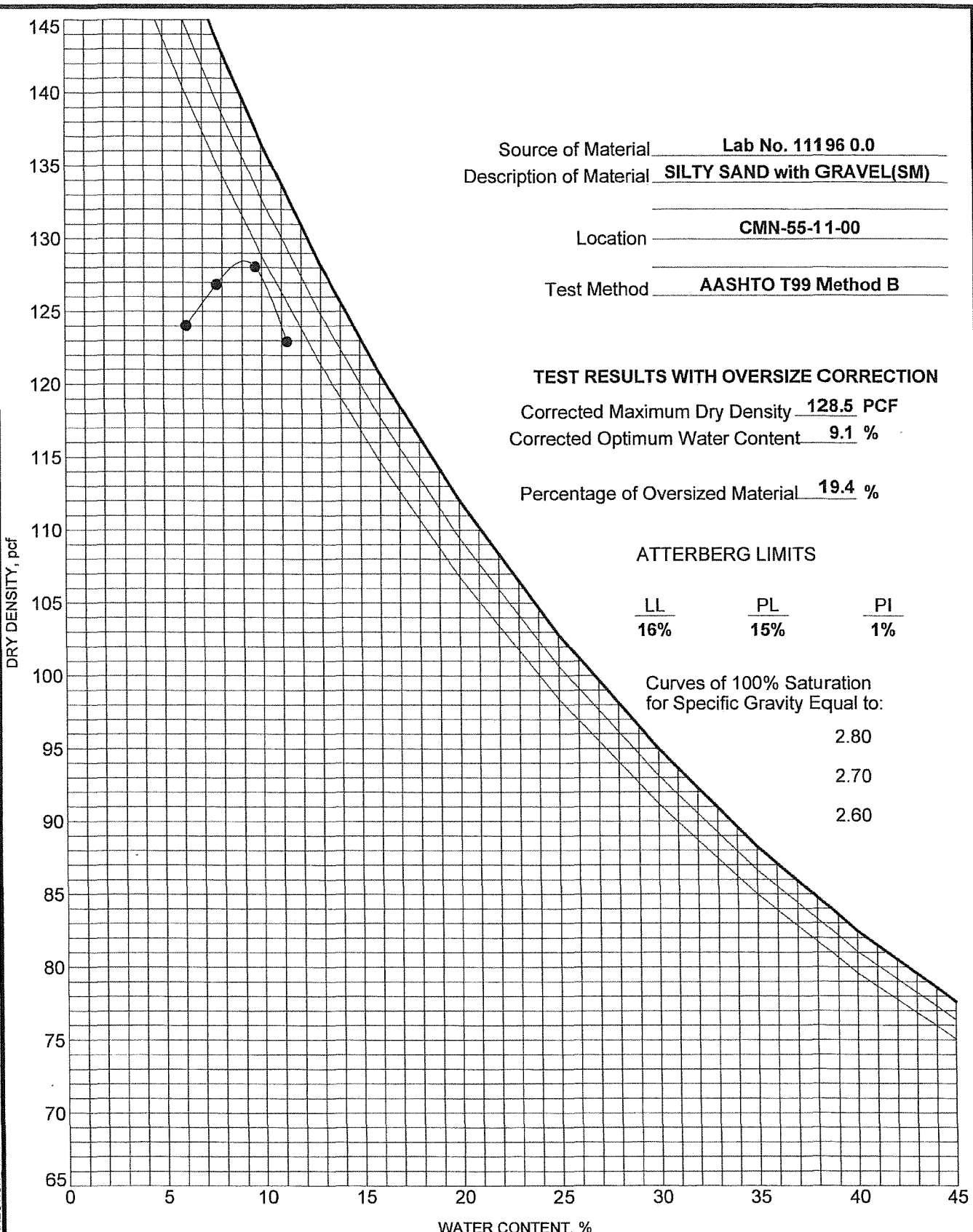
PIONEER TECHNICAL SERVICES, INC.

MOISTURE-DENSITY RELATIONSHIP

Project: Black Pine Mine

Number: 15689

COMPACTION ROCK CORRECTION ASTM BLACK PINE MINE - 15689.GPJ COMPACTION ROCK CORRECTION.GDT 9/16/11



Source of Material: Lab No. 11196 0.0

Description of Material: SILTY SAND with GRAVEL(SM)

Location: CMN-55-11-00

Test Method: AASHTO T99 Method B

TEST RESULTS WITH OVERSIZE CORRECTION

Corrected Maximum Dry Density: 128.5 PCF

Corrected Optimum Water Content: 9.1 %

Percentage of Oversized Material: 19.4 %

ATTERBERG LIMITS

LL	PL	PI
16%	15%	1%

Curves of 100% Saturation for Specific Gravity Equal to:

2.80

2.70

2.60

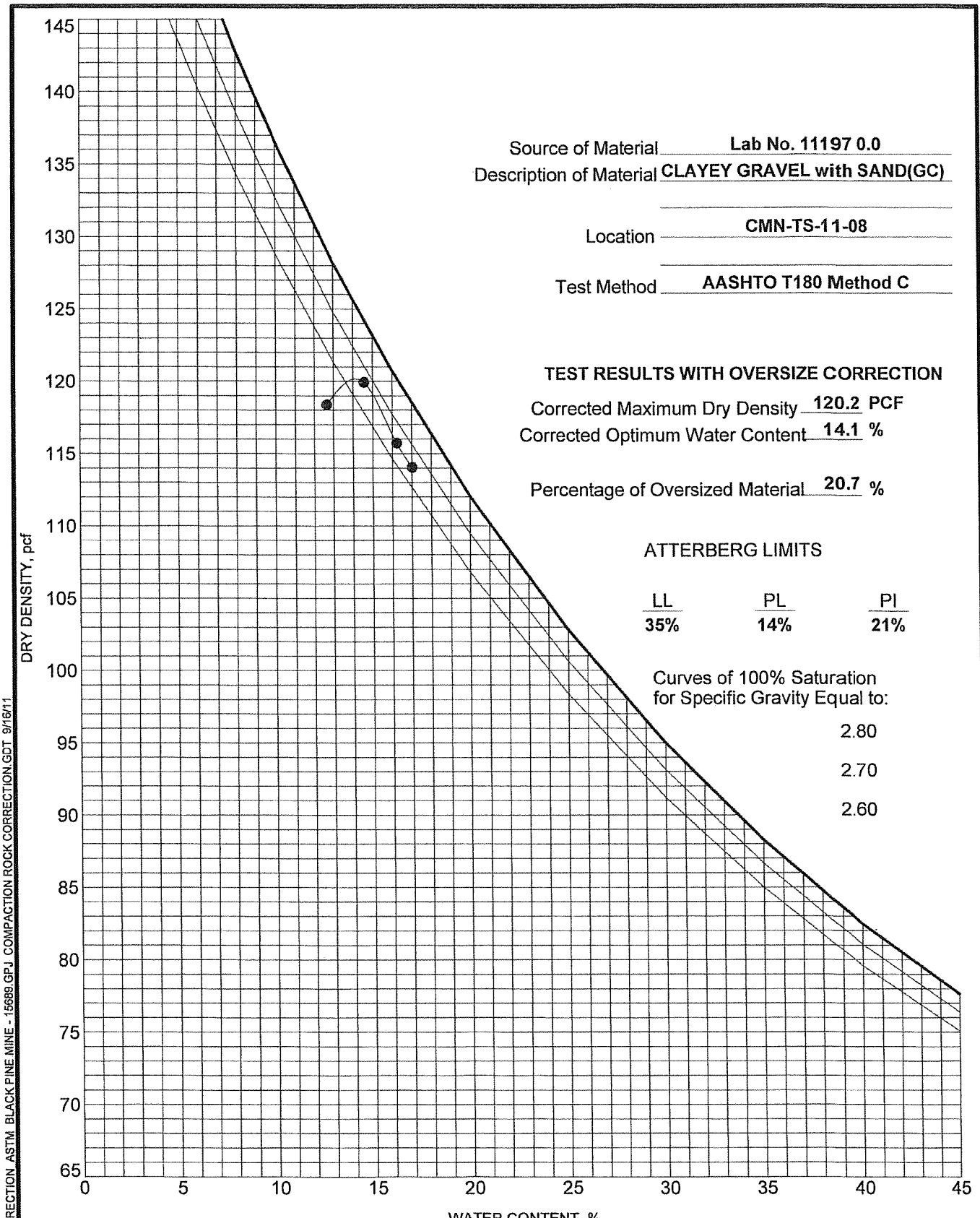
PIONEER TECHNICAL SERVICES, INC.

MOISTURE-DENSITY RELATIONSHIP

Project: Black Pine Mine

Number: 15689

COMPACTION ROCK CORRECTION ASTM BLACK PINE MINE - 15689.GPJ COMPACTION ROCK CORRECTION.GDT 9/16/11



Source of Material: Lab No. 11197 0.0

Description of Material: CLAYEY GRAVEL with SAND(GC)

Location: CMN-TS-11-08

Test Method: AASHTO T180 Method C

TEST RESULTS WITH OVERSIZE CORRECTION

Corrected Maximum Dry Density: 120.2 PCF

Corrected Optimum Water Content: 14.1 %

Percentage of Oversized Material: 20.7 %

ATTERBERG LIMITS

LL	PL	PI
35%	14%	21%

Curves of 100% Saturation for Specific Gravity Equal to:

2.80

2.70

2.60

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MOISTURE-DENSITY RELATIONSHIP

Project: Black Pine Mine

Number: 15689

COMPACTION ROCK CORRECTION ASTM BLACK PINE MINE - 15689.GPJ COMPACTION ROCK CORRECTION.GDT 9/16/11

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Specific Gravity of Soils

Project	Black Pine Mine
Project No.	15689
Location	BP-RY-SS-01-02
Lab No.	11174

Specific Gravity of Fine Material (2.0 minus) | **Percent of Total** | 11.62

Pycnometer Method

Wo	Mass of Sample of oven-dried soil in grams
Wa	Mass of Pycnometer filled with water at Tx in grams
Wb	Mass of Pycnometer filled wth water and soil at Tx in grams
Tx	Temperature of pycnometer contents when Wb was determined
Gs	Specific Gravity

Pycnometer No.	Soak Time Start	Soak Time End	Wo	Wa	Wb	Tx	Gs
250a	8:37	10:37	50.37	417.89	449.32	24.3	2.659

Gs, Tx/Tx = Wo /[Wo + (Wa - Wb)]

Specific Gravity fine Material 2.659

Specific Gravity and Absorption of Coarse Aggregate | **Percent of Total** | 88.38

Oven-Dry Weight in Air (grams) **(A)**	SSD Weight in Air (grams) **(B)**	Weight in Water (grams) **(C)**
4343.9	4435.3	2740.2

Bulk Specific Gravity = A / (B - C)	2.56
Bulk Specific Gravity (SSD) = B / (B - C)	2.62
Apparent Specific Gravity = A / (A - C)	2.71
% Absorption = ((B - A) / A) X 100	2.104

Specific Gravity of Soils page 2

Project	Black Pine Mine
Project No	15689
Location	BP-RY-SS-01-02
Lab No.	11174

Weighted Average Specific Gravity

G avg =	Weighted average specific gravity of soils composed of particles larger and smaller than the 2.0-mm sieve,
R1 =	Percent of soil particles retained on the 2.0-mm sieve
P1 =	Percent of soil particles passing the 2.0-mm sieve
G1 =	apparent specific gravity of soil particles retained on the 2.0-mm sieve as determined by AASHTO T 85
G2 =	Specific gravity of soil particles passing the 2.0-mm sieve as determined by AASHTO T 100-03

G avg = 1 / ((R1 / 100 * G1)+(P1 / 100 *G2))

G avg =	2.703

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Specific Gravity of Soils

Project	Black Pine Mine
Project No.	15689
Location	BP-RY-SS-04-01
Lab No.	11175

Specific Gravity of Fine Material (2.0 minus) | **Percent of Total** | 54.51

Pycnometer Method

Wo Mass of Sample of oven-dried soil in grams
Wa Mass of Pycnometer filled with water at Tx in grams
Wb Mass of Pycnometer filled wth water and soil at Tx in grams
Tx Temperature of pycnometer contents when Wb was determined
Gs Specific Gravity

Pycnometer No.	Soak Time Start	Soak Time End	Wo	Wa	Wb	Tx	Gs
250b	8:44	10:44	38.21	416.19	439.93	23.4	2.641

Gs, Tx/Tx = Wo /[Wo + (Wa - Wb)]

Specific Gravity fine Material 2.641

Specific Gravity and Absorption of Coarse Aggregate | **Percent of Total** | 45.49

Oven-Dry Weight in Air (grams) **(A)**	SSD Weight in Air (grams) **(B)**	Weight in Water (grams) **(C)**
3067	3134.2	1913.8

Bulk Specific Gravity = A / (B - C)	2.51
Bulk Specific Gravity (SSD) = B / (B - C)	2.57
Apparent Specific Gravity = A / (A - C)	2.66
% Absorption = ((B - A) / A) X 100	2.191

Specific Gravity of Soils page 2

Project	Black Pine Mine
Project No	15689
Location	BP-RY-SS-04-01
Lab No.	11175

Weighted Average Specific Gravity

G avg =	Weighted average specific gravity of soils composed of particles larger and smaller than the 2.0-mm sieve,
R1 =	Percent of soil particles retained on the 2.0-mm sieve
P1 =	Percent of soil particles passing the 2.0-mm sieve
G1 =	apparent specific gravity of soil particles retained on the 2.0-mm sieve as determined by AASHTO T 85
G2 =	Specific gravity of soil particles passing the 2.0-mm sieve as determined by AASHTO T 100-03

G avg = 1 / ((R1 / 100 * G1)+(P1 / 100 *G2))

G avg =	2.649

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Specific Gravity of Soils

Project	Black Pine Mine
Project No.	15689
Location	BP-RY-SS-03-00
Lab No.	11176

Specific Gravity of Fine Material (2.0 minus) | **Percent of Total** | 34.96

Pycnometer Method

Wo Mass of Sample of oven-dried soil in grams
Wa Mass of Pycnometer filled with water at Tx in grams
Wb Mass of Pycnometer filled wth water and soil at Tx in grams
Tx Temperature of pycnometer contents when Wb was determined
Gs Specific Gravity

Pycnometer No.	Soak Time Start	Soak Time End	Wo	Wa	Wb	Tx	Gs
250c	8:51	10:51	39.78	418.62	443.32	23.8	2.638

Gs, Tx/Tx = Wo /[Wo + (Wa - Wb)]

Specific Gravity fine Material 2.638

Specific Gravity and Absorption of Coarse Aggregate | **Percent of Total** | 65.04

Oven-Dry Weight in Air (grams) **(A)**	SSD Weight in Air (grams) **(B)**	Weight in Water (grams) **(C)**
4279.6	4391.5	2708.9

Bulk Specific Gravity = A / (B - C)	2.54
Bulk Specific Gravity (SSD) = B / (B - C)	2.61
Apparent Specific Gravity = A / (A - C)	2.72
% Absorption = ((B - A) / A) X 100	2.615

Specific Gravity of Soils page 2

Project	Black Pine Mine
Project No	15689
Location	BP-RY-SS-03-00
Lab No.	11176

Weighted Average Specific Gravity

G avg =	Weighted average specific gravity of soils composed of particles larger and smaller than the 2.0-mm sieve,
R1 =	Percent of soil particles retained on the 2.0-mm sieve
P1 =	Percent of soil particles passing the 2.0-mm sieve
G1 =	apparent specific gravity of soil particles retained on the 2.0-mm sieve as determined by AASHTO T 85
G2 =	Specific gravity of soil particles passing the 2.0-mm sieve as determined by AASHTO T 100-03

G avg = 1 / ((R1 / 100 * G1)+(P1 / 100 *G2))

G avg =	2.694

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Specific Gravity of Soils

Project	Black Pine Mine
Project No.	15689
Location	BP-RY-SS-05-00
Lab No.	11177

Specific Gravity of Fine Material (2.0 minus) | **Percent of Total** | 22.76

Pycnometer Method

Wo Mass of Sample of oven-dried soil in grams
Wa Mass of Pycnometer filled with water at Tx in grams
Wb Mass of Pycnometer filled wth water and soil at Tx in grams
Tx Temperature of pycnometer contents when Wb was determined
Gs Specific Gravity

Pycnometer No.	Soak Time Start	Soak Time End	Wo	Wa	Wb	Tx	Gs
250d	8:58	10:58	38.84	416.92	439.75	24.2	2.426

Gs, Tx/Tx = Wo /[Wo + (Wa - Wb)]

Specific Gravity fine Material 2.426

Specific Gravity and Absorption of Coarse Aggregate | **Percent of Total** | 77.24

Oven-Dry Weight in Air (grams) **(A)**	SSD Weight in Air (grams) **(B)**	Weight in Water (grams) **(C)**
4617.1	5134.5	2908.9

Bulk Specific Gravity = A / (B - C)	2.07
Bulk Specific Gravity (SSD) = B / (B - C)	2.31
Apparent Specific Gravity = A / (A - C)	2.70
% Absorption = ((B - A) / A) X 100	11.206

Specific Gravity of Soils page 2

Project	Black Pine Mine
Project No	15689
Location	BP-RY-SS-05-00
Lab No.	11177

Weighted Average Specific Gravity

G avg =	Weighted average specific gravity of soils composed of particles larger and smaller than the 2.0-mm sieve,
R1 =	Percent of soil particles retained on the 2.0-mm sieve
P1 =	Percent of soil particles passing the 2.0-mm sieve
G1 =	apparent specific gravity of soil particles retained on the 2.0-mm sieve as determined by AASHTO T 85
G2 =	Specific gravity of soil particles passing the 2.0-mm sieve as determined by AASHTO T 100-03

G avg = 1 / ((R1 / 100 * G1)+(P1 / 100 *G2))

G avg =	2.634

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Specific Gravity of Soils

Project	Black Pine Mine
Project No.	15689
Location	BP-RY-SS-03-01
Lab No.	11178

Specific Gravity of Fine Material (2.0 minus) | **Percent of Total** | 34.81

Pycnometer Method

Wo	Mass of Sample of oven-dried soil in grams
Wa	Mass of Pycnometer filled with water at Tx in grams
Wb	Mass of Pycnometer filled wth water and soil at Tx in grams
Tx	Temperature of pycnometer contents when Wb was determined
Gs	Specific Gravity

Pycnometer No.	Soak Time Start	Soak Time End	Wo	Wa	Wb	Tx	Gs
250e	9:05	11:05	34.95	416.37	438.27	23.7	2.678

Gs, Tx/Tx = Wo /[Wo + (Wa - Wb)]

Specific Gravity fine Material 2.678

Specific Gravity and Absorption of Coarse Aggregate | **Percent of Total** | 65.19

Oven-Dry Weight in Air (grams) **(A)**	SSD Weight in Air (grams) **(B)**	Weight in Water (grams) **(C)**
4786.7	5055.9	2927.8

Bulk Specific Gravity = A / (B - C)	2.25
Bulk Specific Gravity (SSD) = B / (B - C)	2.38
Apparent Specific Gravity = A / (A - C)	2.58
% Absorption = ((B - A) / A) X 100	5.624

Specific Gravity of Soils page 2

Project	Black Pine Mine
Project No	15689
Location	BP-RY-SS-03-01
Lab No.	11178

Weighted Average Specific Gravity

G avg =	Weighted average specific gravity of soils composed of particles larger and smaller than the 2.0-mm sieve,
R1 =	Percent of soil particles retained on the 2.0-mm sieve
P1 =	Percent of soil particles passing the 2.0-mm sieve
G1 =	apparent specific gravity of soil particles retained on the 2.0-mm sieve as determined by AASHTO T 85
G2 =	Specific gravity of soil particles passing the 2.0-mm sieve as determined by AASHTO T 100-03

G avg = 1 / ((R1 / 100 * G1)+(P1 / 100 *G2))

G avg =	2.610

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Specific Gravity of Soils

Project	Black Pine Mine
Project No.	15689
Location	BP-RY-SS-05-01
Lab No.	11179

Specific Gravity of Fine Material (2.0 minus) | **Percent of Total** | 2.91

Pycnometer Method

Wo	Mass of Sample of oven-dried soil in grams
Wa	Mass of Pycnometer filled with water at Tx in grams
Wb	Mass of Pycnometer filled wth water and soil at Tx in grams
Tx	Temperature of pycnometer contents when Wb was determined
Gs	Specific Gravity

Pycnometer No.	Soak Time Start	Soak Time End	Wo	Wa	Wb	Tx	Gs
250f	10:50	12:50	56.62	417.67	452.92	24.7	2.650

Gs, Tx/Tx = Wo /[Wo + (Wa - Wb)]

Specific Gravity fine Material 2.650

Specific Gravity and Absorption of Coarse Aggregate | **Percent of Total** | 97.09

Oven-Dry Weight in Air (grams) **(A)**	SSD Weight in Air (grams) **(B)**	Weight in Water (grams) **(C)**
4738.7	4882.4	2985.3

Bulk Specific Gravity = A / (B - C)	2.50
Bulk Specific Gravity (SSD) = B / (B - C)	2.57
Apparent Specific Gravity = A / (A - C)	2.70
% Absorption = ((B - A) / A) X 100	3.032

Specific Gravity of Soils page 2

Project	Black Pine Mine
Project No	15689
Location	BP-RY-SS-05-01
Lab No.	11179

Weighted Average Specific Gravity

G avg =	Weighted average specific gravity of soils composed of particles larger and smaller than the 2.0-mm sieve,
R1 =	Percent of soil particles retained on the 2.0-mm sieve
P1 =	Percent of soil particles passing the 2.0-mm sieve
G1 =	apparent specific gravity of soil particles retained on the 2.0-mm sieve as determined by AASHTO T 85
G2 =	Specific gravity of soil particles passing the 2.0-mm sieve as determined by AASHTO T 100-03

G avg = 1 / ((R1 / 100 * G1)+(P1 / 100 *G2))

G avg =	2.701

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Specific Gravity of Soils

Project	Black Pine Mine
Project No.	15689
Location	BP-RY-02-00
Lab No.	11180

Specific Gravity of Fine Material (2.0 minus) | **Percent of Total** | 10.12

Pycnometer Method

Wo	Mass of Sample of oven-dried soil in grams
Wa	Mass of Pycnometer filled with water at Tx in grams
Wb	Mass of Pycnometer filled wth water and soil at Tx in grams
Tx	Temperature of pycnometer contents when Wb was determined
Gs	Specific Gravity

Pycnometer No.	Soak Time Start	Soak Time End	Wo	Wa	Wb	Tx	Gs
250g	11:00	1:00	36.12	416.63	438.17	24.9	2.477

Gs, Tx/Tx = Wo /[Wo + (Wa - Wb)]

Specific Gravity fine Material 2.477

Specific Gravity and Absorption of Coarse Aggregate | **Percent of Total** | 89.88

Oven-Dry Weight in Air (grams) **(A)**	SSD Weight in Air (grams) **(B)**	Weight in Water (grams) **(C)**
4561.6	4656.6	2882.1

Bulk Specific Gravity = A / (B - C)	2.57
Bulk Specific Gravity (SSD) = B / (B - C)	2.62
Apparent Specific Gravity = A / (A - C)	2.72
% Absorption = ((B - A) / A) X 100	2.083

Specific Gravity of Soils page 2

Project	Black Pine Mine
Project No	15689
Location	BP-RY-02-00
Lab No.	11180

Weighted Average Specific Gravity

G avg =	Weighted average specific gravity of soils composed of particles larger and smaller than the 2.0-mm sieve,
R1 =	Percent of soil particles retained on the 2.0-mm sieve
P1 =	Percent of soil particles passing the 2.0-mm sieve
G1 =	apparent specific gravity of soil particles retained on the 2.0-mm sieve as determined by AASHTO T 85
G2 =	Specific gravity of soil particles passing the 2.0-mm sieve as determined by AASHTO T 100-03

G avg = 1 / ((R1 / 100 * G1)+(P1 / 100 *G2))

G avg =	2.690

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Helena, Montana 59601
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Specific Gravity of Soils

Project	Black Pine Mine
Project No.	15689
Location	BP-RY-SS-04-00
Lab No.	11181

Specific Gravity of Fine Material (2.0 minus) | **Percent of Total** | 11.51

Pycnometer Method

Wo	Mass of Sample of oven-dried soil in grams
Wa	Mass of Pycnometer filled with water at Tx in grams
Wb	Mass of Pycnometer filled wth water and soil at Tx in grams
Tx	Temperature of pycnometer contents when Wb was determined
Gs	Specific Gravity

Pycnometer No.	Soak Time Start	Soak Time End	Wo	Wa	Wb	Tx	Gs
250a	8:38	10:38	60.03	417.93	455.22	23.5	2.640

Gs, Tx/Tx = Wo /[Wo + (Wa - Wb)]

Specific Gravity fine Material 2.640

Specific Gravity and Absorption of Coarse Aggregate | **Percent of Total** | 88.49

Oven-Dry Weight in Air (grams) **(A)**	SSD Weight in Air (grams) **(B)**	Weight in Water (grams) **(C)**
3190.9	3268.5	1996.8

Bulk Specific Gravity = A / (B - C)	2.51
Bulk Specific Gravity (SSD) = B / (B - C)	2.57
Apparent Specific Gravity = A / (A - C)	2.67
% Absorption = ((B - A) / A) X 100	2.432

Specific Gravity of Soils page 2

Project	Black Pine Mine
Project No	15689
Location	BP-RY-SS-04-00
Lab No.	11181

Weighted Average Specific Gravity

G avg =	Weighted average specific gravity of soils composed of particles larger and smaller than the 2.0-mm sieve,
R1 =	Percent of soil particles retained on the 2.0-mm sieve
P1 =	Percent of soil particles passing the 2.0-mm sieve
G1 =	apparent specific gravity of soil particles retained on the 2.0-mm sieve as determined by AASHTO T 85
G2 =	Specific gravity of soil particles passing the 2.0-mm sieve as determined by AASHTO T 100-03

G avg = 1 / ((R1 / 100 * G1)+(P1 / 100 *G2))

G avg =	2.668

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Specific Gravity of Soils

Project	Black Pine Mine
Project No.	15689
Location	BP-RY-SS-01-00
Lab No.	11182

Specific Gravity of Fine Material (2.0 minus) | **Percent of Total** | 25.43

Pycnometer Method

Wo	Mass of Sample of oven-dried soil in grams
Wa	Mass of Pycnometer filled with water at Tx in grams
Wb	Mass of Pycnometer filled wth water and soil at Tx in grams
Tx	Temperature of pycnometer contents when Wb was determined
Gs	Specific Gravity

Pycnometer No.	Soak Time Start	Soak Time End	Wo	Wa	Wb	Tx	Gs
250b	8:45	10:45	63.96	416.16	455.13	23.5	2.559

Gs, Tx/Tx = Wo /[Wo + (Wa - Wb)]

Specific Gravity fine Material 2.559

Specific Gravity and Absorption of Coarse Aggregate | **Percent of Total** | 74.57

Oven-Dry Weight in Air (grams) **(A)**	SSD Weight in Air (grams) **(B)**	Weight in Water (grams) **(C)**
3002.5	3075.1	1894.7

Bulk Specific Gravity = A / (B - C)	2.54
Bulk Specific Gravity (SSD) = B / (B - C)	2.61
Apparent Specific Gravity = A / (A - C)	2.71
% Absorption = ((B - A) / A) X 100	2.418

Specific Gravity of Soils page 2

Project	Black Pine Mine
Project No	15689
Location	BP-RY-SS-01-00
Lab No.	11182

Weighted Average Specific Gravity

G avg =	Weighted average specific gravity of soils composed of particles larger and smaller than the 2.0-mm sieve,
R1 =	Percent of soil particles retained on the 2.0-mm sieve
P1 =	Percent of soil particles passing the 2.0-mm sieve
G1 =	apparent specific gravity of soil particles retained on the 2.0-mm sieve as determined by AASHTO T 85
G2 =	Specific gravity of soil particles passing the 2.0-mm sieve as determined by AASHTO T 100-03

G avg = 1 / ((R1 / 100 * G1)+(P1 / 100 *G2))

G avg =	2.670

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Specific Gravity of Soils

Project	Black Pine Mine
Project No.	15689
Location	BP-RY-02-01
Lab No.	11183

Specific Gravity of Fine Material (2.0 minus) | **Percent of Total** | 18.04

Pycnometer Method

Wo	Mass of Sample of oven-dried soil in grams
Wa	Mass of Pycnometer filled with water at Tx in grams
Wb	Mass of Pycnometer filled wth water and soil at Tx in grams
Tx	Temperature of pycnometer contents when Wb was determined
Gs	Specific Gravity

Pycnometer No.	Soak Time Start	Soak Time End	Wo	Wa	Wb	Tx	Gs
250c	8:51	10:51	63.07	418.68	457.81	23.2	2.635

Gs, Tx/Tx = Wo /[Wo + (Wa - Wb)]

Specific Gravity fine Material 2.635

Specific Gravity and Absorption of Coarse Aggregate | **Percent of Total** | 81.96

Oven-Dry Weight in Air (grams) **(A)**	SSD Weight in Air (grams) **(B)**	Weight in Water (grams) **(C)**
6121.6	6205.1	3826.2

Bulk Specific Gravity = A / (B - C)	2.57
Bulk Specific Gravity (SSD) = B / (B - C)	2.61
Apparent Specific Gravity = A / (A - C)	2.67
% Absorption = ((B - A) / A) X 100	1.364

Specific Gravity of Soils page 2

Project	Black Pine Mine
Project No	15689
Location	BP-RY-02-01
Lab No.	11183

Weighted Average Specific Gravity

G avg =	Weighted average specific gravity of soils composed of particles larger and smaller than the 2.0-mm sieve,
R1 =	Percent of soil particles retained on the 2.0-mm sieve
P1 =	Percent of soil particles passing the 2.0-mm sieve
G1 =	apparent specific gravity of soil particles retained on the 2.0-mm sieve as determined by AASHTO T 85
G2 =	Specific gravity of soil particles passing the 2.0-mm sieve as determined by AASHTO T 100-03

G avg = 1 / ((R1 / 100 * G1)+(P1 / 100 *G2))

G avg =	2.661

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Specific Gravity of Soils

Project	Black Pine Mine
Project No.	15689
Location	BP-HM-R5-06
Lab No.	11184

Specific Gravity of Fine Material (4.75 minus) | **Percent of Total** | 36.84

Pycnometer Method

Wo Mass of Sample of oven-dried soil in grams
Wa Mass of Pycnometer filled with water at Tx in grams
Wb Mass of Pycnometer filled wth water and soil at Tx in grams
Tx Temperature of pycnometer contents when Wb was determined
Gs Specific Gravity

Pycnometer No.	Soak Time Start	Soak Time End	Wo	Wa	Wb	Tx	Gs
250a	9:55	11:50	55.98	417.95	452.63	23.2	2.628

Gs, Tx/Tx = Wo /[Wo + (Wa - Wb)]

Specific Gravity fine Material 2.628

Specific Gravity and Absorption of Coarse Aggregate | **Percent of Total** | 63.16

Oven-Dry Weight in Air (grams) **(A)**	SSD Weight in Air (grams) **(B)**	Weight in Water (grams) **(C)**
5025.6	5235.9	3103.3

Bulk Specific Gravity = A / (B - C)	2.36
Bulk Specific Gravity (SSD) = B / (B - C)	2.46
Apparent Specific Gravity = A / (A - C)	2.61
% Absorption = ((B - A) / A) X 100	4.185

Specific Gravity of Soils page 2

Project	Black Pine Mine
Project No	15689
Location	BP-HM-R5-06
Lab No.	11184

Weighted Average Specific Gravity

G avg =	Weighted average specific gravity of soils composed of particles larger and smaller than the 4.75-mm sieve
R1 =	Percent of soil particles retained on the 4.75-mm sieve
P1 =	Percent of soil particles passing the 4.75-mm sieve
G1 =	apparent specific gravity of soil particles reatined on the 4.75-mm sieve as determined by AASHTO T 85
G2 =	Specific gravity of soil particles passing the 4.75-mm sieve as determined by AASHTO T 100-03

G avg = 1 / ((R1 / 100 * G1)+(P1 / 100 *G2))

G avg =	2.619

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Specific Gravity of Soils

Project	Black Pine Mine
Project No.	15689
Location	BP-HM-R5-01-05
Lab No.	11185

Specific Gravity of Fine Material (4.75 minus) | **Percent of Total** | 58.99

Pycnometer Method

Wo	Mass of Sample of oven-dried soil in grams
Wa	Mass of Pycnometer filled with water at Tx in grams
Wb	Mass of Pycnometer filled wth water and soil at Tx in grams
Tx	Temperature of pycnometer contents when Wb was determined
Gs	Specific Gravity

Pycnometer No.	Soak Time Start	Soak Time End	Wo	Wa	Wb	Tx	Gs
250c	9:55	11:50	68.08	418.72	460.92	23.8	2.631

Gs, Tx/Tx = Wo /[Wo + (Wa - Wb)]

Specific Gravity fine Material 2.631

Specific Gravity and Absorption of Coarse Aggregate | **Percent of Total** | 41.01

Oven-Dry Weight in Air (grams) **(A)**	SSD Weight in Air (grams) **(B)**	Weight in Water (grams) **(C)**
2789.5	2886.5	1747.6

Bulk Specific Gravity = A / (B - C)	2.45
Bulk Specific Gravity (SSD) = B / (B - C)	2.53
Apparent Specific Gravity = A / (A - C)	2.68
% Absorption = ((B - A) / A) X 100	3.477

Specific Gravity of Soils page 2

Project	Black Pine Mine
Project No	15689
Location	BP-HM-R5-01-05
Lab No.	11185

Weighted Average Specific Gravity

G avg =	Weighted average specific gravity of soils composed of particles larger and smaller than the 4.75-mm sieve,
R1 =	Percent of soil particles retained on the 4.75-mm sieve
P1 =	Percent of soil particles passing the 4.75-mm sieve
G1 =	apparent specific gravity of soil particles retained on the 4.75-mm sieve as determined by AASHTO T 85
G2 =	Specific gravity of soil particles passing the 4.75-mm sieve as determined by AASHTO T 100-03

G avg = 1 / ((R1 / 100 * G1)+(P1 / 100 *G2))

G avg =	2.650

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Specific Gravity of Soils

Project	Black Pine Mine
Project No.	15689
Location	BP-TS-R5-01
Lab No.	11186

Specific Gravity of Fine Material (4.75 minus) | **Percent of Total** | 43.59

Pycnometer Method

Wo	Mass of Sample of oven-dried soil in grams
Wa	Mass of Pycnometer filled with water at Tx in grams
Wb	Mass of Pycnometer filled wth water and soil at Tx in grams
Tx	Temperature of pycnometer contents when Wb was determined
Gs	Specific Gravity

Pycnometer No.	Soak Time Start	Soak Time End	Wo	Wa	Wb	Tx	Gs
250d	12:05	2:00	53.76	417.12	450.49	22.2	2.637

Gs, Tx/Tx = Wo /[Wo + (Wa - Wb)]

Specific Gravity fine Material 2.637

Specific Gravity and Absorption of Coarse Aggregate | **Percent of Total** | 56.41

Oven-Dry Weight in Air (grams) **(A)**	SSD Weight in Air (grams) **(B)**	Weight in Water (grams) **(C)**
3897.1	3957.5	2432.2

Bulk Specific Gravity = A / (B - C)	2.55
Bulk Specific Gravity (SSD) = B / (B - C)	2.59
Apparent Specific Gravity = A / (A - C)	2.66
% Absorption = ((B - A) / A) X 100	1.550

Specific Gravity of Soils page 2

Project	Black Pine Mine
Project No	15689
Location	BP-TS-R5-01
Lab No.	11186

Weighted Average Specific Gravity

G avg =	Weighted average specific gravity of soils composed of particles larger and smaller than the 4.75-mm sieve,
R1 =	Percent of soil particles retained on the 4.75-mm sieve
P1 =	Percent of soil particles passing the 4.75-mm sieve
G1 =	apparent specific gravity of soil particles retained on the 4.75-mm sieve as determined by AASHTO T 85
G2 =	Specific gravity of soil particles passing the 4.75-mm sieve as determined by AASHTO T 100-03

G avg = 1 / ((R1 / 100 * G1)+(P1 / 100 *G2))

G avg =	2.650

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Helena, Montana 59601
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Specific Gravity of Soils

Project	Black Pine Mine
Project No.	15689
Location	CMN-SS-09-00
Lab No.	11195

Specific Gravity of Fine Material (4.75 minus) | **Percent of Total** | 50.76

Pycnometer Method

Wo	Mass of Sample of oven-dried soil in grams
Wa	Mass of Pycnometer filled with water at Tx in grams
Wb	Mass of Pycnometer filled wth water and soil at Tx in grams
Tx	Temperature of pycnometer contents when Wb was determined
Gs	Specific Gravity

Pycnometer No.	Soak Time Start	Soak Time End	Wo	Wa	Wb	Tx	Gs
250e	12:05	2:00	51.26	416.44	447.79	24.4	2.575

Gs, Tx/Tx = Wo /[Wo + (Wa - Wb)]

Specific Gravity fine Material 2.575

Specific Gravity and Absorption of Coarse Aggregate | **Percent of Total** | 49.24

Oven-Dry Weight in Air (grams) **(A)**	SSD Weight in Air (grams) **(B)**	Weight in Water (grams) **(C)**
1603.8	1656.9	999.6

Bulk Specific Gravity = A / (B - C)	2.44
Bulk Specific Gravity (SSD) = B / (B - C)	2.52
Apparent Specific Gravity = A / (A - C)	2.65
% Absorption = ((B - A) / A) X 100	3.311

Specific Gravity of Soils page 2

Project	Black Pine Mine
Project No	15689
Location	CMN-SS-09-00
Lab No.	11195

Weighted Average Specific Gravity

G avg =	Weighted average specific gravity of soils composed of particles larger and smaller than the 4.75-mm sieve,
R1 =	Percent of soil particles retained on the 4.75-mm sieve
P1 =	Percent of soil particles passing the 4.75-mm sieve
G1 =	apparent specific gravity of soil particles retained on the 4.75-mm sieve as determined by AASHTO T 85
G2 =	Specific gravity of soil particles passing the 4.75-mm sieve as determined by AASHTO T 100-03

G avg = 1 / ((R1 / 100 * G1)+(P1 / 100 *G2))

G avg =	2.613

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Specific Gravity of Soils

Project	Black Pine Mine
Project No.	15689
Location	CMN-SS-11-00
Lab No.	11196

Specific Gravity of Fine Material (4.75 minus) | **Percent of Total** | 70.05

Pycnometer Method

Wo	Mass of Sample of oven-dried soil in grams
Wa	Mass of Pycnometer filled with water at Tx in grams
Wb	Mass of Pycnometer filled wth water and soil at Tx in grams
Tx	Temperature of pycnometer contents when Wb was determined
Gs	Specific Gravity

Pycnometer No.	Soak Time Start	Soak Time End	Wo	Wa	Wb	Tx	Gs
250f	12:05	2:00	51.91	417.76	449.95	24.7	2.632

Gs, Tx/Tx = Wo /[Wo + (Wa - Wb)]

Specific Gravity fine Material 2.632

Specific Gravity and Absorption of Coarse Aggregate | **Percent of Total** | 29.95

Oven-Dry Weight in Air (grams) **(A)**	SSD Weight in Air (grams) **(B)**	Weight in Water (grams) **(C)**
4480.2	4617.2	2783.9

Bulk Specific Gravity = A / (B - C)	2.44
Bulk Specific Gravity (SSD) = B / (B - C)	2.52
Apparent Specific Gravity = A / (A - C)	2.64
% Absorption = ((B - A) / A) X 100	3.058

Specific Gravity of Soils page 2

Project	Black Pine Mine
Project No	15689
Location	CMN-SS-11-00
Lab No.	11196

Weighted Average Specific Gravity

G avg =	Weighted average specific gravity of soils composed of particles larger and smaller than the 4.75-mm sieve,
R1 =	Percent of soil particles retained on the 4.75-mm sieve
P1 =	Percent of soil particles passing the 4.75-mm sieve
G1 =	apparent specific gravity of soil particles retained on the 4.75-mm sieve as determined by AASHTO T 85
G2 =	Specific gravity of soil particles passing the 4.75-mm sieve as determined by AASHTO T 100-03

G avg = 1 / ((R1 / 100 * G1)+(P1 / 100 *G2))

G avg =	2.635

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Specific Gravity of Soils

Project	Black Pine Mine
Project No.	15689
Location	CMN-TS-11-08
Lab No.	11197

Specific Gravity of Fine Material (2.0 minus) | **Percent of Total** | 41.46

Pycnometer Method

Wo	Mass of Sample of oven-dried soil in grams
Wa	Mass of Pycnometer filled with water at Tx in grams
Wb	Mass of Pycnometer filled wth water and soil at Tx in grams
Tx	Temperature of pycnometer contents when Wb was determined
Gs	Specific Gravity

Pycnometer No.	Soak Time Start	Soak Time End	Wo	Wa	Wb	Tx	Gs
250e	8:55	10:55	37.94	416.43	440.48	23.2	2.731

Gs, Tx/Tx = Wo /[Wo + (Wa - Wb)]

Specific Gravity fine Material 2.731

Specific Gravity and Absorption of Coarse Aggregate | **Percent of Total** | 58.54

Oven-Dry Weight in Air (grams) **(A)**	SSD Weight in Air (grams) **(B)**	Weight in Water (grams) **(C)**
3388.1	3475.1	2099

Bulk Specific Gravity = A / (B - C)	2.46
Bulk Specific Gravity (SSD) = B / (B - C)	2.53
Apparent Specific Gravity = A / (A - C)	2.63
% Absorption = ((B - A) / A) X 100	2.568

Specific Gravity of Soils page 2

Project	Black Pine Mine
Project No	15689
Location	CMN-TS-11-08
Lab No.	11197

Weighted Average Specific Gravity

G avg =	Weighted average specific gravity of soils composed of particles larger and smaller than the 2.0-mm sieve,
R1 =	Percent of soil particles retained on the 2.0-mm sieve
P1 =	Percent of soil particles passing the 2.0-mm sieve
G1 =	apparent specific gravity of soil particles retained on the 2.0-mm sieve as determined by AASHTO T 85
G2 =	Specific gravity of soil particles passing the 2.0-mm sieve as determined by AASHTO T 100-03

G avg = 1 / ((R1 / 100 * G1)+(P1 / 100 *G2))

G avg =	2.670

Borehole	Depth	Liquid Limit	Plastic Limit	Plasticity Index	Maximum Size (mm)	%<#200 Sieve	Class-ification	Water Content (%)	Dry Density (pcf)	Satur-ation (%)	Void Ratio
Lab No. 11174	2.7	23	20	3	75	5	A-1-a	2.7			
Lab No. 11175	8.0	19	15	4	75	39	A-4	5.5			
Lab No. 11176	1.5	22	21	1	75	30	A-2-4	3.8			
Lab No. 11177	1.5	50	43	7	75	17	A-2-5	4.2			
Lab No. 11178	13.0	23	18	5	100	23	A-1-b	10.1			
Lab No. 11179	5.0	21	20	1	100	2	A-1-a	4.1			
Lab No. 11180	0.5	62	52	10	75	7	A-2-5	4.3			
Lab No. 11181	1.5	22	20	2	75	7	A-1-a	7.5			
Lab No. 11182	1.3	34	29	5	50	17	A-1-b	4.0			
Lab No. 11183	2.7	34	28	6	100	14	A-1-a	6.8			
Lab No. 11184	0.0	20	18	2	50	20	A-1-b	10.5			
Lab No. 11185	0.0	36	15	21	50	41	A-6	16.1			
Lab No. 11186	0.0	NP	NP	NP	75	11	A-1-a				
Lab No. 11195	0.0	26	21	5	75	27	A-2-4	18.4			
Lab No. 11196	0.0	16	15	1	50	39	A-4				
Lab No. 11197	0.0	35	14	21	75	35	A-2-6				
Lab No. 11503	12.0	46	16	30	37.5	59	A-7-6	14.5			
Lab No. 11504	10.0	19	17	2	37.5	22	A-1-b	4.0			
Lab No. 11505	3.0	31	30	1	37.5	35	A-2-4	6.4			

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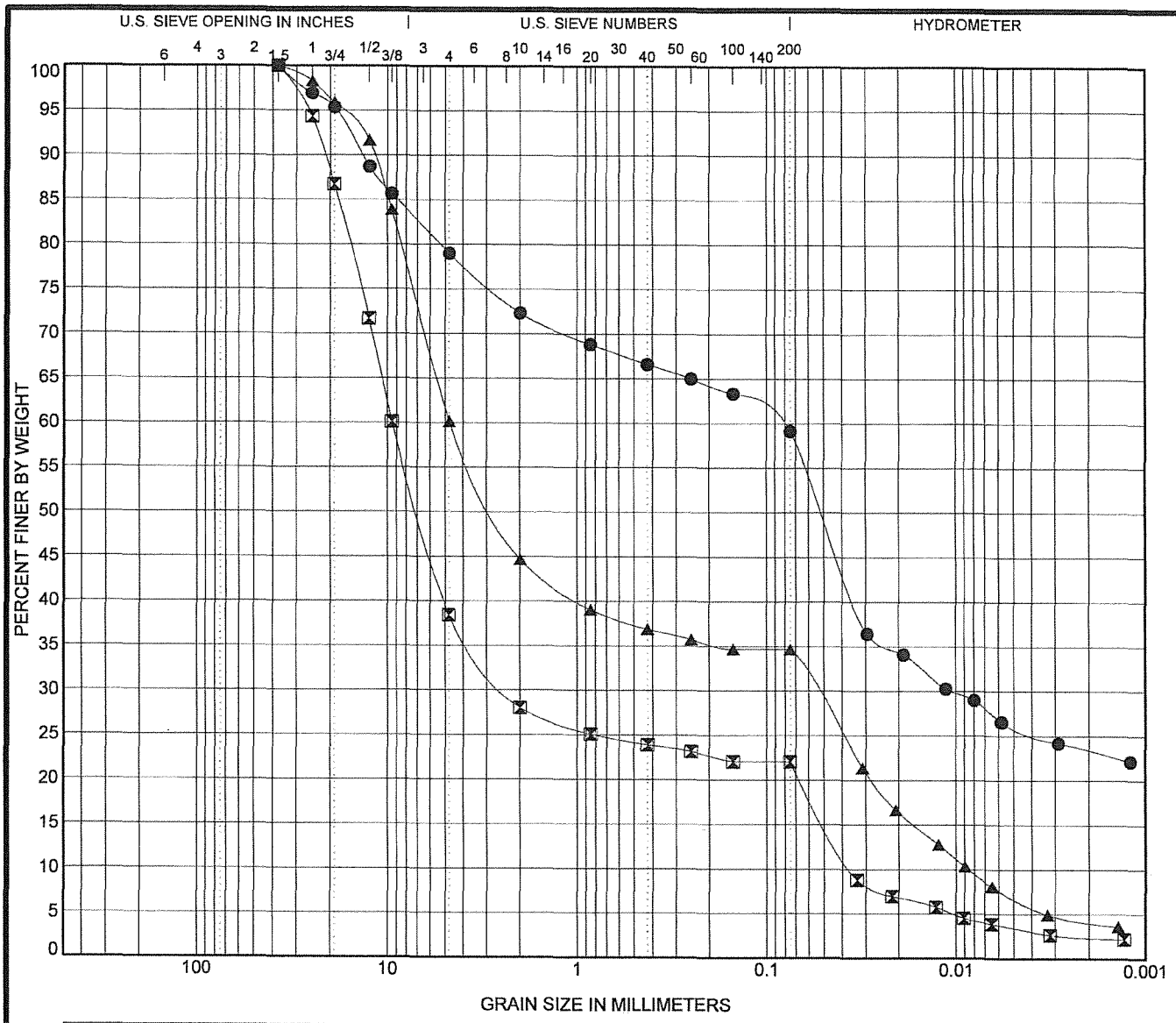
Summary of Laboratory Results

Project: Black Pine Mine

Number: 15689



COBBLES	GRAVEL		SAND			SILT OR CLAY
	coarse	fine	coarse	medium	fine	

Specimen Identification		Classification	LL	PL	PI	Cc	Cu
● Lab No. 11503	12.0	GRAVELLY LEAN CLAY with SAND(CL)	46	16	30		
⊠ Lab No. 11504	10.0	SILTY GRAVEL with SAND(GM)	19	17	2	16.29	262.39
▲ Lab No. 11505	3.0	SILTY GRAVEL with SAND(GM)	31	30	1	0.08	548.73

Specimen Identification		D100	D50	D15	D10	%Gravel	%Sand	%Silt	%Clay
● Lab No. 11503	12.0	37.5	0.051			21.0	19.8	35.8	23.3
⊠ Lab No. 11504	10.0	37.5	6.875	0.049	0.036	61.6	16.4	19.6	2.4
▲ Lab No. 11505	3.0	37.5	2.693	0.017	0.009	39.9	25.5	30.5	4.2

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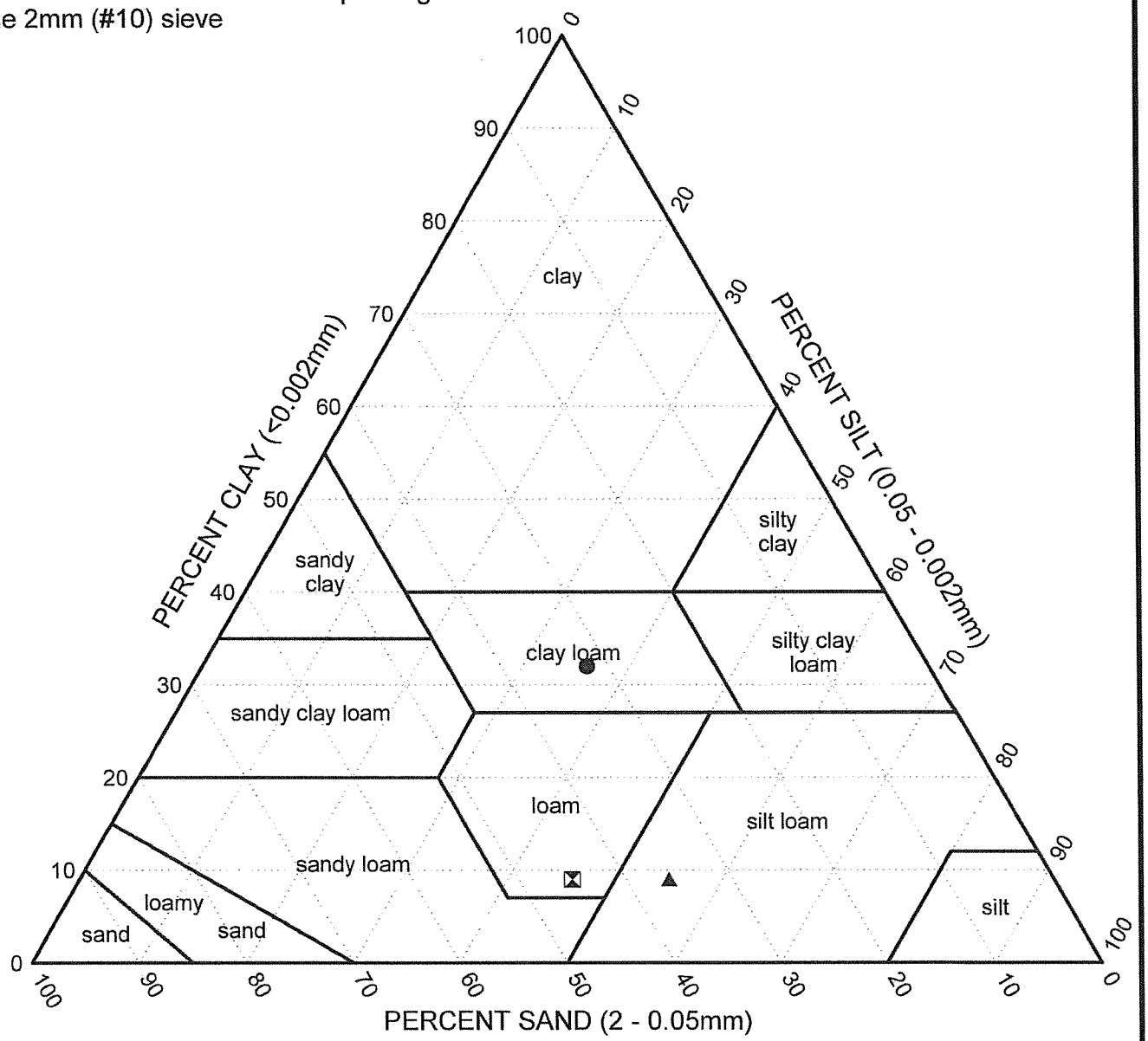
GRAIN SIZE DISTRIBUTION

Project: Black Pine Mine

Number: 15689

US GRAIN SIZE ASTM BLACK PINE MINE - 15689.GPJ PIONEER.GDT 9/19/11

Fractions normalized to 100% passing the 2mm (#10) sieve



	Borehole	Depth (ft)	USDA Classification	Sand (%)	Silt (%)	Clay (%)
●	Lab No. 11503	12.0	CLAY LOAM	31.9	35.9	32.2
⊠	Lab No. 11504	10.0	LOAM	45.1	46.2	8.7
▲	Lab No. 11505	3.0	SILT LOAM	36.2	54.5	9.3

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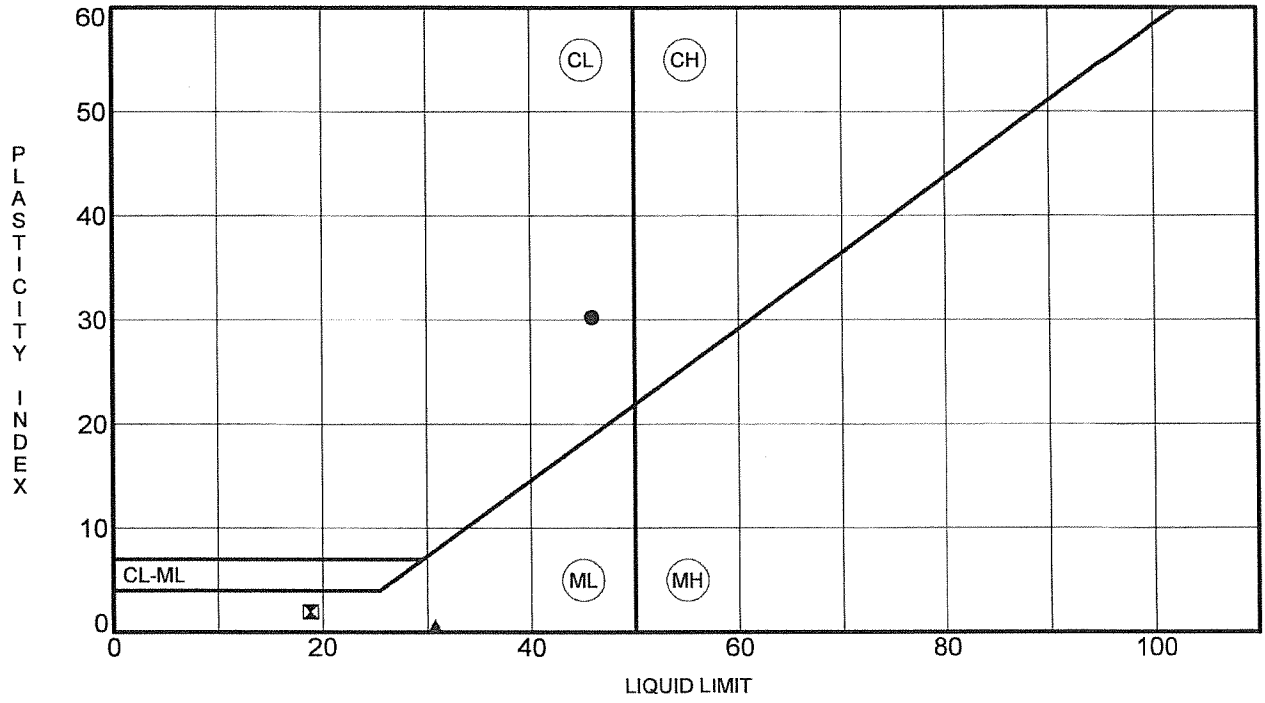
USDA Textural Classification Chart

Project: Black Pine Mine

Number: 15689

USDA TEXTURAL CLASSIFICATION BLACK PINE MINE - 15689.GPJ PIONEER.GDT 9/19/11



	Specimen	Depth	LL	PL	PI	Fines	Classification
●	**Lab No. 11503**	**12.0**	**46**	**16**	**30**	**59**	**GRAVELLY LEAN CLAY with SAND(CL)**
⊠	**Lab No. 11504**	**10.0**	**19**	**17**	**2**	**22**	**SILTY GRAVEL with SAND(GM)**
▲	**Lab No. 11505**	**3.0**	**31**	**30**	**1**	**35**	**SILTY GRAVEL with SAND(GM)**

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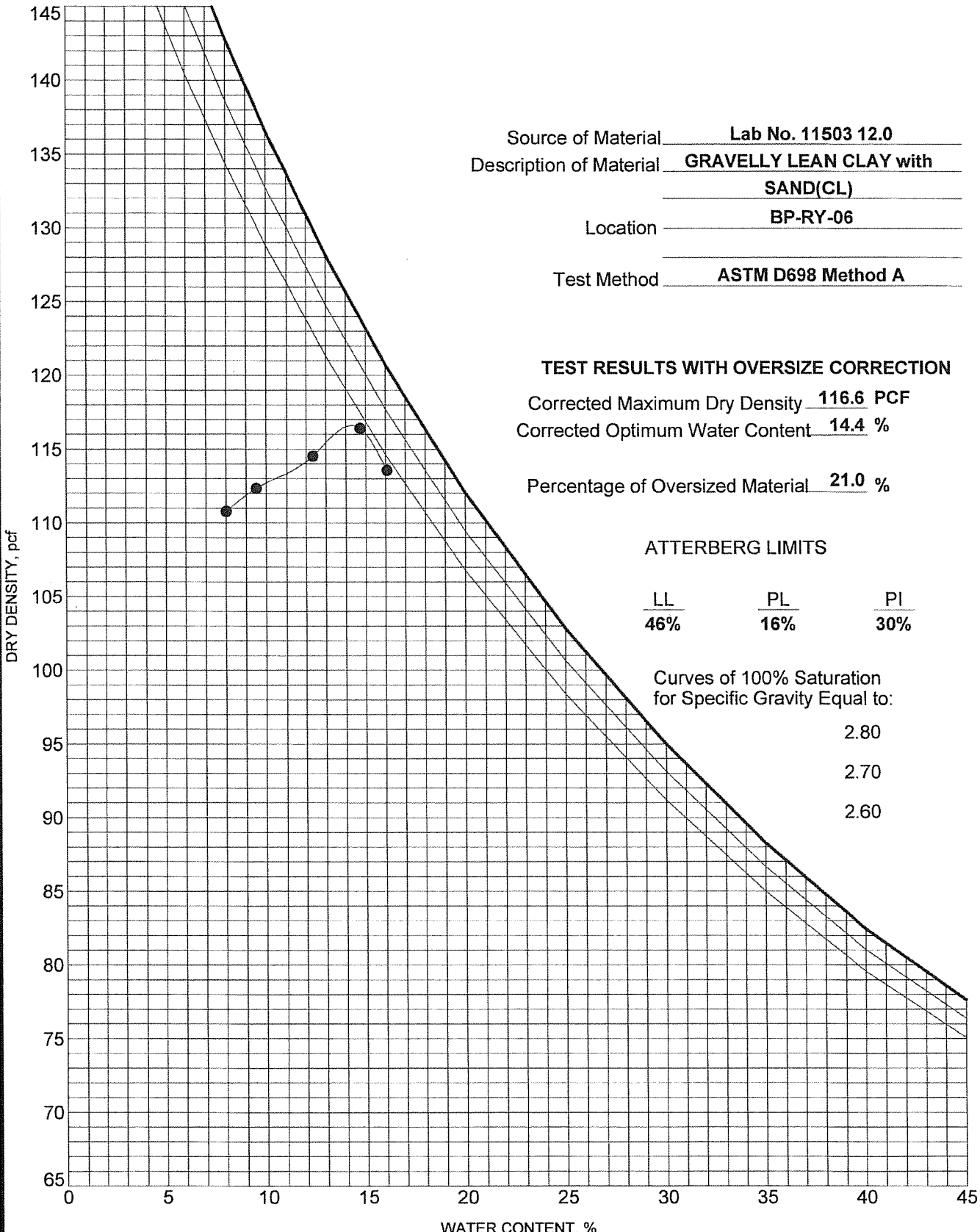
ATTERBERG LIMITS' RESULTS

Project: Black Pine Mine

Number: 15689

US_ATTERBERG_LIMITS_BLACK PINE MINE - 15689.GPJ_PIONEER.GDT 9/19/11



Source of Material: Lab No. 11503 12.0

Description of Material: GRAVELLY LEAN CLAY with SAND(CL)

Location: BP-RY-06

Test Method: ASTM D698 Method A

TEST RESULTS WITH OVERSIZE CORRECTION

Corrected Maximum Dry Density: 116.6 PCF

Corrected Optimum Water Content: 14.4 %

Percentage of Oversized Material: 21.0 %

ATTERBERG LIMITS

LL	PL	PI
46%	16%	30%

Curves of 100% Saturation for Specific Gravity Equal to:

2.80

2.70

2.60

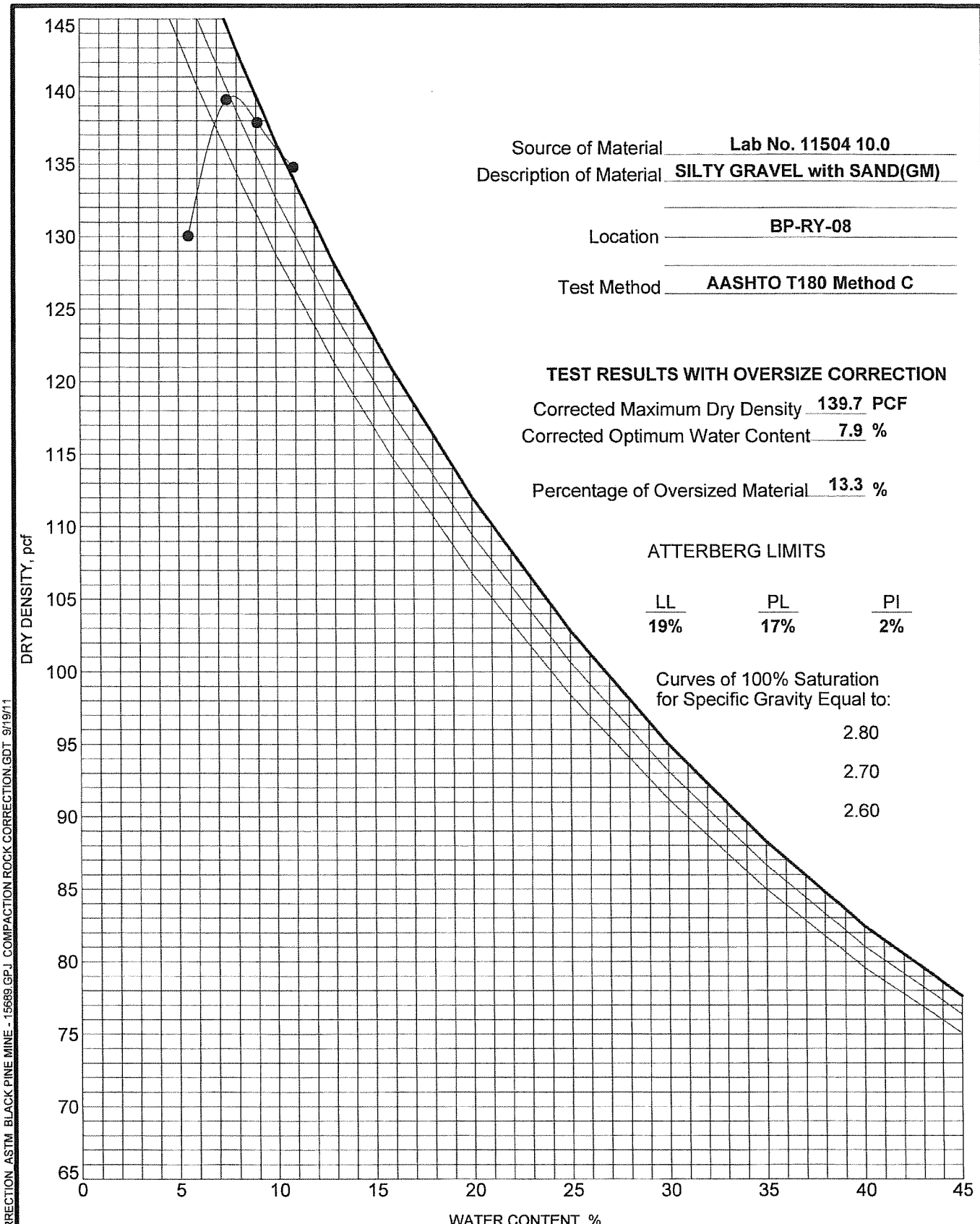
PIONEER TECHNICAL SERVICES, INC.

MOISTURE-DENSITY RELATIONSHIP

Project: Black Pine Mine

Number: 15689

COMPACTION ROCK CORRECTION ASTM BLACK PINE MINE - 15689.GPJ COMPACTION ROCK CORRECTION.GDT 9/19/11



Source of Material: Lab No. 11504 10.0

Description of Material: SILTY GRAVEL with SAND(GM)

Location: BP-RY-08

Test Method: AASHTO T180 Method C

TEST RESULTS WITH OVERSIZE CORRECTION

Corrected Maximum Dry Density: 139.7 PCF

Corrected Optimum Water Content: 7.9 %

Percentage of Oversized Material: 13.3 %

ATTERBERG LIMITS

LL	PL	PI
19%	17%	2%

Curves of 100% Saturation for Specific Gravity Equal to:

2.80

2.70

2.60

PIONEER TECHNICAL SERVICES, INC.

MOISTURE-DENSITY RELATIONSHIP

Project: Black Pine Mine

Number: 15689

COMPACTION ROCK CORRECTION ASTM BLACK PINE MINE - 15689.GPJ COMPACTION ROCK CORRECTION.GDT 9/19/11

PIONEER TECHNICAL SERVICES, INC.
201 East Broadway, Suite C
Helena, Montana 59601
Phone (406)457-8252 Fax (406)442-1158
www.pioneer-technical.com

Specific Gravity of Soils

Project	Black Pine Mine
Project No.	15689
Location	BP-RY-06
Lab No.	11503

Specific Gravity of Fine Material (4.75 minus) | **Percent of Total** | 79.01

Pycnometer Method

Wo	Mass of Sample of oven-dried soil in grams
Wa	Mass of Pycnometer filled with water at Tx in grams
Wb	Mass of Pycnometer filled wth water and soil at Tx in grams
Tx	Temperature of pycnometer contents when Wb was determined
Gs	Specific Gravity

Pycnometer No.	Soak Time Start	Soak Time End	Wo	Wa	Wb	Tx	Gs
250c	10:05	12:05	35.03	418.75	440.88	23.5	2.716

Gs, Tx/Tx = Wo /[Wo + (Wa - Wb)]

Specific Gravity fine Material 2.716

Specific Gravity and Absorption of Coarse Aggregate | **Percent of Total** | 20.99

Oven-Dry Weight in Air (grams) **(A)**	SSD Weight in Air (grams) **(B)**	Weight in Water (grams) **(C)**
562.7	576.2	351.1

Bulk Specific Gravity = A / (B - C)	2.50
Bulk Specific Gravity (SSD) = B / (B - C)	2.56
Apparent Specific Gravity = A / (A - C)	2.66
% Absorption = ((B - A) / A) X 100	2.399

Specific Gravity of Soils page 2

Project	Black Pine Mine
Project No	15689
Location	BP-RY-06
Lab No.	11503

Weighted Average Specific Gravity

G avg =	Weighted average specific gravity of soils composed of particles larger and smaller than the 4.75-mm sieve,
R1 =	Percent of soil particles retained on the 4.75-mm sieve
P1 =	Percent of soil particles passing the 4.75-mm sieve
G1 =	apparent specific gravity of soil particles retained on the 4.75-mm sieve as determined by AASHTO T 85
G2 =	Specific gravity of soil particles passing the 4.75-mm sieve as determined by AASHTO T 100-03

G avg = 1 / ((R1 / 100 * G1)+(P1 / 100 *G2))

G avg =	2.704

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Specific Gravity of Soils

Project	Black Pine Mine
Project No.	15689
Location	BP-RY-08
Lab No.	11504

Specific Gravity of Fine Material (4.75 minus) | **Percent of Total** | 38.53

Pycnometer Method

Wo	Mass of Sample of oven-dried soil in grams
Wa	Mass of Pycnometer filled with water at Tx in grams
Wb	Mass of Pycnometer filled wth water and soil at Tx in grams
Tx	Temperature of pycnometer contents when Wb was determined
Gs	Specific Gravity

Pycnometer No.	Soak Time Start	Soak Time End	Wo	Wa	Wb	Tx	Gs
250e	10:05	12:05	52.67	416.53	449.46	23	2.668

Gs, Tx/Tx = Wo /[Wo + (Wa - Wb)]

Specific Gravity fine Material 2.668

Specific Gravity and Absorption of Coarse Aggregate | **Percent of Total** | 61.47

Oven-Dry Weight in Air (grams) **(A)**	SSD Weight in Air (grams) **(B)**	Weight in Water (grams) **(C)**
1950.3	1985.8	1216.6

Bulk Specific Gravity = A / (B - C)	2.54
Bulk Specific Gravity (SSD) = B / (B - C)	2.58
Apparent Specific Gravity = A / (A - C)	2.66
% Absorption = ((B - A) / A) X 100	1.820

Specific Gravity of Soils page 2

Project	Black Pine Mine
Project No	15689
Location	BP-RY-08
Lab No.	11504

Weighted Average Specific Gravity

G avg =	Weighted average specific gravity of soils composed of particles larger and smaller than the 4.75-mm sieve,
R1 =	Percent of soil particles retained on the 4.75-mm sieve
P1 =	Percent of soil particles passing the 4.75-mm sieve
G1 =	apparent specific gravity of soil particles retained on the 4.75-mm sieve as determined by AASHTO T 85
G2 =	Specific gravity of soil particles passing the 4.75-mm sieve as determined by AASHTO T 100-03

G avg = 1 / ((R1 / 100 * G1)+(P1 / 100 *G2))

G avg =	2.662

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Specific Gravity of Soils

Project	Black Pine Mine
Project No.	15689
Location	BP-RY-07
Lab No.	11505

Specific Gravity of Fine Material (4.75 minus) | **Percent of Total** | 60.50

Pycnometer Method

Wo	Mass of Sample of oven-dried soil in grams
Wa	Mass of Pycnometer filled with water at Tx in grams
Wb	Mass of Pycnometer filled wth water and soil at Tx in grams
Tx	Temperature of pycnometer contents when Wb was determined
Gs	Specific Gravity

Pycnometer No.	Soak Time Start	Soak Time End	Wo	Wa	Wb	Tx	Gs
250F	10:05	12:05	55.14	417.86	451.63	23.1	2.580

Gs, Tx/Tx = Wo /[Wo + (Wa - Wb)]

Specific Gravity fine Material 2.580

Specific Gravity and Absorption of Coarse Aggregate | **Percent of Total** | 39.50

Oven-Dry Weight in Air (grams) **(A)**	SSD Weight in Air (grams) **(B)**	Weight in Water (grams) **(C)**
754	773	471.5

Bulk Specific Gravity = A / (B - C)	2.50
Bulk Specific Gravity (SSD) = B / (B - C)	2.56
Apparent Specific Gravity = A / (A - C)	2.67
% Absorption = ((B - A) / A) X 100	2.520

Specific Gravity of Soils page 2

Project	Black Pine Mine
Project No	15689
Location	BP-RY-07
Lab No.	11505

Weighted Average Specific Gravity

G avg =	Weighted average specific gravity of soils composed of particles larger and smaller than the 4.75-mm sieve,
R1 =	Percent of soil particles retained on the 4.75-mm sieve
P1 =	Percent of soil particles passing the 4.75-mm sieve
G1 =	apparent specific gravity of soil particles retained on the 4.75-mm sieve as determined by AASHTO T 85
G2 =	Specific gravity of soil particles passing the 4.75-mm sieve as determined by AASHTO T 100-03

G avg = 1 / ((R1 / 100 * G1)+(P1 / 100 *G2))

G avg =	2.615

PIONEER
TECHNICAL SERVICES, INC.

October 31, 2011

Ms. Devin J. Clary
Reclamation Specialist, Montana DEQ
P.O. Box 200901
Helena, MT 59620-0901

RE: Black Pine Mine
Pioneer Technical Services Project No. 15689

Dear Ms. Clary:

On September 13, 2011 one sample identified as #11503 were delivered to our soils laboratory in Belgrade, MT. The testing requested on this sample was for Hydraulic Conductivity of Saturated Porous Materials using a Flexible Wall Permeameter (ASTM D58084).

Permeability specimens were compacted at optimum water content to a dry unit weight equal to 95% of the proctor value for the minus #4 portion of the proctor. Moisture-density values were provided by the Pioneer Technical Services Helena Laboratory.

Please call if you have any questions or need any additional testing.

Sincerely,

Niki Griffis

1215 APPLE'S WAY
BELGRADE, MONTANA 59714

PHONE: (406) 388-8578
FAX: (406) 388-8579

HYDRAULIC CONDUCTIVITY FOR FLEXIBLE-WALLED TEST SAMPLES

FALLING HEAD APPARATUS

Client:							Project:	Black Pine Mine			
Sample Description:											
Plasticity Index:					Liquid Limit:			Plastic Limit:		Specific Gravity:	
% Gravel:					% Sand:			% Fines:			
Final Void Ratio:					Initial Saturation:			Final Saturation:		Final Porosity:	
Dry Density (pcf):		110.8			% Max. ASTM D-698:						
Specimen Length (cm):		15.24				Specimen Diameter (cm):		7.112	Area of Standpipe (cm^2):		0.912
Height Inlet Above Floor (cm):						Height Outlet Above Bench (cm):		15			

Increment Number	Initial Reading Influent (cm^3)	Inital Reading Effluent (cm^3)	Final Reading Influent (cm^3)	Final Reading Effluent (cm^3)	Time Increment (min.)	Applied Pressure Differential (psi)	Initial Head (cm)	Final Head (cm)	Average Hydraulic Gradient (cm/cm)	Hydraulic Conductivity (cm/sec)	Hydraulic Conductivity at 20 C (cm/sec)
1	36.2	13.5	46.2	3.5	898	2.8	171.96	150.04	10.56	8.9E-07	8.9E-07
2	2	42	23.3	21.9	1389	2.8	240.68	195.31	14.30	8.8E-07	8.8E-07
3	23.3	21.9	35.6	9	1433	2.7	188.28	160.66	11.45	6.5E-07	6.6E-07
4	0.6	43.5	40.7	3.1	4279	2.7	236.83	148.60	12.65	6.4E-07	6.4E-07
5	0.6	46.6	14.6	32.7	1342	2.7	240.23	209.65	14.76	5.9E-07	5.9E-07
6	14.6	32.7	28.3	19.1	1443	2.7	209.65	179.73	12.77	6.2E-07	6.4E-07
9											
10											
11											
12											
13											
14											
15											
16											
17											
18											
19											
20	Average Hydraulic Conductivity of Last Four Test Increments =							**6.3E-07**	**cm/sec**		
21											
22											
23											
24											
25											
k = (aL/At) ln (h1/h2)											

APPENDIX I

FERTILIZER CALCULATIONS

Fertilizer Calculator for Soil Bioengineering Applications with Native Plants

prepared by Stuart Jennings, Reclamation Research Group, LLC

Assumptions:
Native Plants require lower levels of fertility compared to agronomic levels of fertility
Lower levels of fertility will reduce biomass production
Soil stabilization applications will require more nutrients (typically N to support grass growth in the first growing season)
Soil materials with existing organic matter will require less fertilization than subsoil or geologic materials with no OM
See decision diagram on second page
High levels of nutrients favor introduced species and invasives
No nutrients equate to no plants and high erosion risk

Background:
Inorganic fertilizers are required by law to be labeled to identify quantities of N-P-K
Organic fertilizers and organic matter contain N-P-K but are not labeled
Inorganic fertilizers provide short-term sources of nutrients (1-2 years for N, 5-10 years for P and K)
Organic amendments and fertilizers provide long-term sources of nutrients through nutrient cycling
Inorganic fertilizers are highly soluble
Organic fertilizers have low solubility (most nutrients are unavailable in any single year)

Plant Available Nutrient Forms:
Nitrogen: NO_3
Phosphorous: PO_4
Potassium: K

Calculation Basics:
Nitrogen as expressed on fertilizer bags is as nitrate (NO_3) units are percent
Phosphorous as expressed on fertilizer bags is as (P_2O_5) units are percent
Potassium as expressed on fertilizer bags is as (K_20) units are percent

Calculation Examples:
Nitrogen: If you purchase 100 pounds of 17-0-0 fertilizer you get 17 pounds of NO3-N
Phosphorous: If you purchase 100 pounds of 0-52-0 fertilizer you get 52 pounds of P2O5 and 22.4 pounds of PO4
Potassium: If you purchase 100 pounds of 0-0-60 you get 60 pounds of K2O and 50 pounds of K

Nutrient	Plant Available Form	Fertilizer Bag Form	Fertilizer Bag Units	To convert from fertilizer bag to plant available	conversion factor
Nitrogen	NO_3	NO_3	%	**multiply by**	1
Phosphorous	PO_4	P_2O_5	%	**multiply by**	0.43
Potassium	K	K_2O	%	**multiply by**	0.83

APPENDIX I. FERTILIZER CALCULATIONS

Inorganic Fertilizer Options (guaranteed analysis)	*Fertilizer Bag Label*			Enter pounds	*Black Pine Mine Repository (Samples were averaged for input into Calculations)* *Fertilizer Form Pounds Per Acre*			*Plant Available Form Pounds Per Acre*			Nutrients from fertilizer A *Plant Available Form* units (mg/kg) ~ppm			How much you want B *Enter your fertility target* units (mg/kg) ~ppm			How much you've got C *Enter your soil data* units (mg/kg) ~ppm			Analysis of options B-(C+A) *Deficit or Surplus* units (mg/kg) ~ppm		
	N	P_2O_5	K_2O	fertilizer per acre	*N*	P_2O_5	K_2O	NO_3	PO_4	K	NO_3	PO_4	K	NO_3	PO_4	K	NO_3	PO_4	K	NO_3	PO_4	K
Triple Ten	10	10	10	300	30	30	30	30.0	12.9	24.9	15.0	6.5	12.5	20	6	100	5.0	10.5	269.0	0.0	11.0	181.5
Ammonium Nitrate	34	0	0	88	29.92	0	0	29.9	0.0	0.0	15.0	0.0	0.0	20	6	100	5.0	10.5	269.0	0.0	4.5	169.0
Monoammonium phosphate (MAP)	11	44	0	275	30.25	121	0	30.3	52.0	0.0	15.1	26.0	0.0	20	6	100	5.0	10.5	269.0	0.1	30.5	169.0
Diammonium phosphate (DAP)	18	46	0	160	28.8	73.6	0	28.8	31.6	0.0	14.4	15.8	0.0	20	6	100	5.0	10.5	269.0	-0.6	20.3	169.0
Triple Super Phosphate (TSP)	0	46	0	100	0	46	0	0.0	19.8	0.0	0.0	9.9	0.0	20	6	100	5.0	10.5	269.0	-15.0	14.4	169.0
Triple Seventeen	17	17	17	175	29.75	29.75	29.75	29.8	12.8	24.7	14.9	6.4	12.3	20	6	100	5.0	10.5	269.0	-0.1	10.9	181.3
Potash	0	0	60	100	0	0	60	0.0	0.0	49.8	0.0	0.0	24.9	20	6	100	5.0	10.5	269.0	-15.0	4.5	193.9
Starter fertilizer	9	23	30	340	30.6	78.2	102	30.6	33.6	84.7	15.3	16.8	42.3	20	6	100	5.0	10.5	269.0	0.3	21.3	211.3
Starter fertilizer	10	12	30	300	30	36	90	30.0	15.5	74.7	15.0	7.7	37.4	20	6	100	5.0	10.5	269.0	0.0	12.2	206.4
Urea	46	0	0	65	29.9	0	0	29.9	0.0	0.0	15.0	0.0	0.0	20	6	100	5.0	10.5	269.0	0.0	4.5	169.0
Potassium Sulfate	0	0	50	100	0	0	50	0.0	0.0	41.5	0.0	0.0	20.8	20	6	100	5.0	10.5	269.0	-15.0	4.5	189.8
Manure (estimated values)														20	6	100	5.0	10.5	269.0			
Dairy	0.15	0.15	0.36	10000	15	15	36	15.0	6.5	29.9	7.5	3.2	14.9	20	6	100	5.0	10.5	269.0	-7.5	7.7	183.9
Beef	0.18	0.27	0.44	10000	18	27	44	18.0	11.6	36.5	9.0	5.8	18.3	20	6	100	5.0	10.5	269.0	-6.0	10.3	187.3
Swine	0.35	0.30	0.36	10000	35	30	36	35.0	12.9	29.9	17.5	6.5	14.9	20	6	100	5.0	10.5	269.0	2.5	11.0	183.9
Chicken	1.00	1.50	1.20	10000	100	150	120	100.0	64.5	99.6	50.0	32.3	49.8	20	6	100	5.0	10.5	269.0	35.0	36.8	218.8
Horse	0.13	0.18	0.40	10000	13	18	40	13.0	7.7	33.2	6.5	3.9	16.6	20	6	100	5.0	10.5	269.0	-8.5	8.4	185.6
Sheep	0.33	0.54	1.60	10000	33	54	160	33.0	23.2	132.8	16.5	11.6	66.4	20	6	100	5.0	10.5	269.0	1.5	16.1	235.4

Compost: similar to the manure above, but highly variable depending on feedstocks. Lab analysis required for definitive answer.

How do I use this calculator?

Establish your revegetation goals and objectives
Determine the nutrient levels required by the plants you are using

Collect soil samples to determine the nutrient levels in your site soil (Part C above)
Enter the Soil Data (Part C) into the spreadsheet
If you don't have Soil data you can guess or use the lowish defaults provided
Figure out how much fertility you want to have (Part B above)
Determine which fertilizer types are available to you locally
Adjust Column E using probable fertilizer types (enter pounds per acre)
Watch the Deficit and Surplus Columns U, V, W to see how much fertility is achieved by varying fertilizer application rates

Unknowns: The amount of soil fertility optimal for common native plant species
Anyone want a research project?

Fertility Guidelines (agronomic crops, not native plants)

Rating	NO_3/N (mg/kg)	P (mg/kg	K (mg/kg)	
Very Low	0-17	0-4	0-75	
Low	17-30	4-8	75-125	starting point for native plants
Medium	30-45	8-11	125-250	
High	>45	11-16	250-500	
Very High		>16	>500	

APPENDIX J

HUMAN HEALTH RISK ASSESSMENT

Table J-1. Determination of the Soil Contaminants of Potential Concern (COPCs) Black Pine Mine

	Surface waste rock mg/kg[b]	Surface tailings mg/kg[c]	*COPC Criteria from EPA 2004*[d]				Above soil clean-up guidelines (Table 7-10 DEQ RBCG)?[d]	COPCs for Black Pine Mine?	Reasoning
			Present at site?	Above background?	Greater than detection limit?	Acceptable QA/QC?			
Antimony	20.60	876.00	Y	Y	Y		Y	Y	Above cleanup
Arsenic	27.80	786.00	Y	Y	Y		Y	Y	Above cleanup
Barium	218.30	334.40	Y	Y	Y		N	N	
Cadmium	0.40	17.00	Y	Y	Y		Y	Y	Above cleanup
Chromium III	4.30	5.60	Y	Y	Y		N	N	
Cobalt	5.90	4.10	Y	N	Y		N	N	
Copper	63.00	2,553.30	Y	Y	Y		Y	Y	Above cleanup
Cyanide[a]	NA	NA	Unk					Unk	
Iron	7,980.00	23,933.0	Y	Y	Y		NA	Y	Above background
Lead	253.30	3,572.90	Y	Y	Y		Y	Y	Above cleanup
Manganese	772.70	303.60	Y	Y	Y		Y	Y	Above cleanup
Mercury	NA	26.40	Y	Y	Y		N	Y	
Nickel	4.90	5.10	Y	N	Y		N	N	
Silver	1.20	67.80	Y	Y	Y		NA	Y	Above background
Zinc	163.50	405.70	Y	Y	Y		N	Y	

Bold = COPC
[a] No soil sample results available
[b] Most concentrated waste area, Combination Mine Site, arithmetic mean for waste rock n=3
[c] Most concentrated tailings area, Combination Mill Site, arithmetic mean for tailings, n=10
[d] Based on DEQ RBCG Tables 7-10 and/or four criteria established by the USEPA RAGS 2004 for COPC determination
Unk = Unkown
NA = Not Applicable

Table J-2. Determination of the Water Contaminants of Potential Concern (COPCs) Black Pine Mine

	Surface water µg/L[b, c]	*COPC Criteria from EPA 2004*[d]				Above water clean-up guidelines (Table 7-11 DEQ RBCG)?[d]	Above MT DEQ-7 WQ Standards (DEQ 2010)	COPCs for Black Pine Mine?	Reasoning
		Present at site?	Above background?	Greater than detection limit?	Acceptable QA/QC?				
Antimony	117.00	Y	Y	Y		Y	Y	Y	Above clean-up
Arsenic	36.00	Y	Y	Y		Y	Y	Y	Above clean-up
Barium	86.70	Y	N	Y		N	N	N	
Cadmium	1.20	Y	Y	Y		N	N	Y	
Chromium III	2.90	Y	Y	Y		N	Unk	Y	
Cobalt[a]	NA	Unk	Unk	Unk		Unk	Unk	Unk	
Copper	221.00	Y	Y	Y		N	N	Y	
Cyanide[a]	NA	Unk	Unk	Unk		Unk	Unk	Unk	
Iron	2,990.00	Y	Y	Y		NA	N	Y	Above secondary standard
Lead	49.00	Y	Y	Y		Y	Y	Y	Above clean-up
Manganese	52.60	Y	Y	Y		Y	Y	Y	Above clean-up
Mercury	2.52	Y	Y	Y		Y	Y	Y	Above clean-up
Nickel	4.20	Y	Y	Y		N	N	Y	
Silver	0.64	Y	N	N		NA	N	Y	Above aquatic standard
Zinc	63.10	Y	Y	Y		Y	N	Y	Above clean-up

Bold = COPC
[a] No water sample results available
[b] Combined AOC maximum point concentrations for surface water
[c] Does not include adit discharge per MTDEQ RBCG 1996
[d] Based on DEQ RBCG Tables 7-11 and/or four criteria established by the USEPA RAGS 2004 for COPC determination
Unk = Unkown
NA = Not Applicable

Table J-3. Recreational Gold Panner/Rock Hound Adult Exposure to Tailings, Waste Rock, and Soils and the Resulting Hazard Quotients
Black Pine Mine

COPCs	Exposure point concentration[a] (EPCs) (mg/kg)	Exposure (mg/kg-day)			Chronic RfD (mg/kgday)		RfC (mg/m^3)	Hazard Quotient (HQ)[b]					Source for Toxic Endpoints
		Ingestion	Dermal	Inhalation	Oral	Dermal	Inhalation	Oral	Dermal	Inhalation	Sum of HQs	Percentage of Total HQ	
Antimony	**875.99**	**4.11E-04**	**9.94E-05**	**2.88E-09**	**4.00E-04**	**6.00E-05**	**NA**	**1.03E+00**	**1.66E+00**		**2.69E+00**	**41.82%**	EPA IRIS 1991
Arsenic	**786.02**	**3.69E-04**	**2.68E-04**	**2.58E-09**	**3.00E-04**	**3.00E-04**	**NA**	**1.23E+00**	**8.92E-01**		**2.12E+00**	**33.05%**	EPA IRIS 1998
Cadmium[c]	16.99	7.98E-06	1.93E-07	5.58E-11	1.00E-03	2.50E-05	NA	7.98E-03	7.72E-03		1.57E-02	0.24%	EPA IRIS 1994
Copper	2,553.30	1.20E-03	2.90E-04	8.39E-09	4.00E-02	4.00E-02	NA	3.00E-02	7.25E-03		3.72E-02	0.58%	EPA HEAST 1997
Iron	23,933.00	1.12E-02	2.72E-03	7.87E-08	7.00E-01	7.00E-01	NA	1.61E-02	3.88E-03		1.99E-02	0.31%	EPA PPRTV 2006
Lead	**3,572.93**	**1.68E-03**	**4.06E-04**	**1.17E-08**	**1.50E-03**	**1.50E-03**	**4.30E-04**	**1.12E+00**	**2.70E-01**	**2.73E-05**	**1.39E+00**	**21.63%**	DEQ RBCG; CALEPA 2005
Manganese	772.67	3.63E-04	8.77E-05	2.54E-09	1.40E-01	5.60E-03	5.00E-05	2.59E-03	1.57E-02	5.08E-05	1.83E-02	0.29%	EPA IRIS 1997
Mercury	26.45	1.24E-05	3.00E-06	8.69E-11	1.60E-04	3.00E-04	3.00E-04	7.76E-02	1.00E-02	2.90E-07	8.76E-02	1.36%	EPA IRIS 1995; CALEPA 2005
Silver	67.80	3.18E-05	7.69E-06	2.23E-10	5.00E-03	2.00E-04	NA	6.37E-03	3.85E-02		4.48E-02	0.70%	EPA IRIS 1996
Zinc	405.66	1.91E-04	4.60E-05	1.33E-09	3.00E-01	3.00E-01	NA	6.35E-04	1.53E-04		7.89E-04	0.01%	EPA IRIS 2005
						Total HQ		3.52E+00	2.90E+00	7.84E-05	6.42E+00		
						% of Total Exposure HQ		54.80%	45.20%	0.00%			

Bold = COC

[a] Maximum concentration per COPC of the arithmetic mean of the COPC concentration in tailings from the Combination Mill AOC or waste rock from Combination Mine AOC

[b] HQ = Exposure/Chronic Reference Dose (RfD)

[c] Cadmium and Manganese oral RfD is for specific to food/dietary (solid) intake

NA = Not Applicable

Table J-4. Recreational Gold Panner/Rock Hound Child Exposure to Tailings, Waste Rock, and Soils and the Resulting Hazard Quotients
Black Pine Mine

COPCs	Exposure point conc.[a] (EPCs) (mg/kg)	Exposure (mg/kg-day)			Chronic RfD (mg/kg-day)		RfC (mg/m^3)	Hazard Quotient (HQ)[b]					Source for Toxic Endpoints
		Ingestion	Dermal	Inhalation	Oral	Dermal	Inhalation	Oral	Dermal	Inhalation	Sum of HQs	% of Total HQ	
Antimony	**876.00**	**8.00E-04**	**1.44E-04**	**1.13E-08**	**4.00E-04**	**6.00E-05**	**NA**	**2.00E+00**	**2.40E+00**		**4.40E+00**	**39.83%**	EPA IRIS 1991
Arsenic	**786.00**	**7.18E-04**	**3.88E-04**	**1.02E-08**	**3.00E-04**	**3.00E-04**	**NA**	**2.39E+00**	**1.29E+00**		**3.68E+00**	**33.36%**	EPA IRIS 1998
Cadmium[c]	17.00	1.55E-05	2.79E-07	2.19E-10	1.00E-03	2.50E-05	NA	1.55E-02	1.12E-02		2.67E-02	0.24%	EPA IRIS 1994
Copper	2,553.30	2.33E-03	4.20E-04	3.30E-08	4.00E-02	4.00E-02	NA	5.83E-02	1.05E-02		6.88E-02	0.62%	EPA HEAST 1997
Iron	23,933.00	2.19E-02	3.93E-03	3.09E-07	7.00E-01	7.00E-01	NA	3.12E-02	5.62E-03		3.68E-02	0.33%	EPA PPRTV 2006
Lead	**3,572.90**	**3.26E-03**	**5.87E-04**	**4.61E-08**	**1.50E-03**	**1.50E-03**	**4.30E-04**	**2.18E+00**	**3.92E-01**	**1.07E-04**	**2.57E+00**	**23.24%**	DEQ RBCG; CALEPA 2005
Manganese	772.70	7.06E-04	1.27E-04	9.98E-09	1.40E-01	5.60E-03	5.00E-05	5.04E-03	2.27E-02	2.00E-04	2.79E-02	0.25%	EPA IRIS 1997
Mercury	26.40	2.42E-05	4.35E-06	3.42E-10	1.60E-04	3.00E-04	3.00E-04	1.51E-01	1.45E-02	1.14E-06	1.65E-01	1.50%	EPA IRIS 1995; CALEPA 2005
Silver	67.80	6.19E-05	1.11E-05	8.75E-10	5.00E-03	2.00E-04	NA	1.24E-02	5.57E-02		6.81E-02	0.62%	EPA IRIS 1996
Zinc	405.66	3.70E-04	6.67E-05	5.24E-09	3.00E-01	3.00E-01	NA	1.23E-03	2.22E-04		1.46E-03	0.01%	EPA IRIS 2005
							Total HQ	6.84E+00	4.20E+00	3.08E-04	1.10E+01		
							% of Total Exposure HQ	61.94%	38.06%	0.00%			

Bold = COC

[a] Maximum concentration per COPC of the arithmetic mean of the COPC concentration in tailings from the Combination Mill AOC or waste rock from Combination Mine

[b] HQ = Exposure/Chronic Reference Dose (RfD)

[c] Cadmium and Manganese oral RfD is for specific to food/dietary (solid) intake

NA = Not Applicable

Table J-5. Recreational Gold Panner/Rock Hound Adult Exposure to Surface Water, Excluding Seep Discharge and the Resulting Hazard Quotients
Black Pine Mine

COPCs	Exposure point conc.[a] (EPCs) (µg/L)	Exposure (mg/kg-day)		Chronic RfD (mg/kg-day)		Hazard Quotient (HQ)[b]				Source for Toxic Endpoints
		Ingestion	Dermal	Oral	Dermal	Oral	Dermal	HQ Total	% of Total HQ	
Antimony	117.00	2.29E-04	3.43E-06	4.00E-04	6.00E-05	5.72E-01	5.72E-02	6.30E-01	63.55%	EPA IRIS 1991
Arsenic	36.00	7.05E-05	1.06E-06	3.00E-04	3.00E-04	2.35E-01	3.52E-03	2.38E-01	24.06%	EPA IRIS 1998
Cadmium[c]	1.20	2.35E-06	3.52E-08	5.00E-04	2.50E-05	4.70E-03	1.41E-03	6.11E-03	0.62%	EPA IRIS 1994
Chromium III	2.90	5.68E-06	8.51E-08	1.50E+00	1.95E-02	3.78E-06	4.37E-06	8.15E-06	0.00%	EPA IRIS 1998
Copper	221.00	4.32E-04	6.49E-06	4.00E-02	4.00E-02	1.08E-02	1.62E-04	1.10E-02	1.11%	EPA HEAST 1997
Iron	2,990.00	5.85E-03	8.78E-05	7.00E-01	7.00E-01	8.36E-03	1.25E-04	8.48E-03	0.86%	EPA PPRTV 2006
Lead	49.00	9.59E-05	1.44E-07	1.50E-03	1.50E-03	6.39E-02	9.59E-05	6.40E-02	6.46%	DEQ RBCG; CALEPA 2005
Manganese[d]	52.60	1.03E-04	1.54E-06	1.40E-01	5.60E-03	7.35E-04	2.76E-04	1.01E-03	0.10%	EPA IRIS 1997
Mercury	2.52	4.93E-06	7.40E-08	1.60E-04	3.00E-04	3.08E-02	2.47E-04	3.11E-02	3.14%	EPA IRIS 1995; CALEPA 2005
Nickel	4.20	8.22E-06	2.47E-08	2.00E-02	8.00E-04	4.11E-04	3.08E-05	4.42E-04	0.04%	EPA IRIS 1996; ATSDR 2005
Silver	0.64	1.25E-06	1.13E-08	5.00E-03	2.00E-04	2.50E-04	5.64E-05	3.07E-04	0.03%	EPA IRIS 1996
Zinc	63.10	1.23E-04	1.11E-06	3.00E-01	3.00E-01	4.12E-04	3.70E-06	4.15E-04	0.04%	EPA IRIS 2005
					Total HQ	9.28E-01	6.32E-02	9.91E-01		
					% of Total HQ	93.62%	6.38%			

Bold = COC
[a] Maximum sample point concentration for surface waters, excluding seep discharge
[b] HQ = Exposure/Chronic Reference Dose (RfD)
[c] Cadmium oral RfD is for specific to water intake
[d] Manganese oral RfD is specific to dietary intake

Table J-6. Recreational Gold Panner/Rock Hound Child Exposure to Surface Water, Excluding Seep Discharge and the Resulting Hazard Quotients
Black Pine Mine

COPCs	Exposure point conc.[a] (EPCs) (µg/L)	Exposure (mg/kg-day)		Chronic RfD (mg/kg-day)		Hazard Quotient (HQ)[b]				Source for Toxic Endpoints
		Ingestion	Dermal	Oral	Dermal	Oral	Dermal	Sum of HQs	% of Total HQ	
Antimony	**117.00**	**1.07E-03**	**4.81E-06**	**4.00E-04**	**6.00E-05**	**2.67E+00**	**8.01E-02**	**2.75E+00**	**62.28%**	EPA IRIS 1991
Arsenic	**36.00**	**3.29E-04**	**1.48E-06**	**3.00E-04**	**3.00E-04**	**1.10E+00**	**4.93E-03**	**1.10E+00**	**24.92%**	EPA IRIS 1998
Cadmium[c]	1.20	1.10E-05	4.93E-08	5.00E-04	2.50E-05	2.19E-02	1.97E-03	2.39E-02	0.54%	EPA IRIS 1994
Chromium III	2.90	2.65E-05	1.19E-07	1.50E+00	1.95E-02	1.77E-05	6.11E-06	2.38E-05	0.00%	EPA IRIS 1998
Copper	221.00	2.02E-03	9.08E-06	4.00E-02	4.00E-02	5.05E-02	2.27E-04	5.07E-02	1.15%	EPA HEAST 1997
Iron	2,990.00	2.73E-02	1.23E-04	7.00E-01	7.00E-01	3.90E-02	1.76E-04	3.92E-02	0.89%	EPA PPRTV 2006
Lead	49.00	4.47E-04	2.01E-07	1.50E-03	1.50E-03	2.98E-01	1.34E-04	2.98E-01	6.76%	DEQ RBCG; CALEPA 2005
Manganese[d]	52.60	4.80E-04	2.16E-06	1.40E-01	5.60E-03	3.43E-03	3.86E-04	3.82E-03	0.09%	EPA IRIS 1997
Mercury	2.50	2.30E-05	1.04E-07	1.60E-04	3.00E-04	1.44E-01	3.45E-04	1.44E-01	3.26%	EPA IRIS 1995; CALEPA 2005
Nickel	4.20	3.84E-05	3.45E-08	2.00E-02	8.00E-04	1.92E-03	4.32E-05	1.96E-03	0.04%	EPA IRIS 1996; ATSDR 2005
Silver	0.60	5.84E-06	1.58E-08	5.00E-03	2.00E-04	1.17E-03	7.89E-05	1.25E-03	0.03%	EPA IRIS 1996
Zinc	63.10	5.76E-04	1.56E-06	3.00E-01	3.00E-01	1.92E-03	5.19E-06	1.93E-03	0.04%	EPA IRIS 2005
					Total HQs	4.33E+00	8.84E-02	4.42E+00		
					% of Total HQ	98.00%	2.00%			

Bold = COC
[a] Maximum sample point concentration for surface waters, excluding seep discharge
[b] HQ = Exposure/Chronic Reference Dose (RfD)
[c] Cadmium oral RfD is for specific to water intake
[d] Manganese oral RfD is specific to dietary intake

Table J-7. Recreational Gold Panner/Rock Hound Adult Exposure to Sediment and the Resulting Hazard Quotients Black Pine Mine

COPCs	Exposure Point Concentration in Sediment[a] (EPCs) (mg/kg)	Exposure[b] (mg/kg-day)	Chronic RfD (mg/kg-day)	Hazard Quotient (HQ)[c]
		Ingestion	Oral	Oral
Antimony	**891.00**	**4.18E-04**	**4.00E-04**	**1.05E+00**
Arsenic	**642.00**	**3.02E-04**	**3.00E-04**	**1.01E+00**
Cadmium[d]	32.50	1.53E-05	1.00E-03	1.53E-02
Copper	5320.00	2.50E-03	4.00E-02	6.25E-02
Iron	37400.00	1.76E-02	7.00E-01	2.51E-02
Lead	**4240.00**	**1.99E-03**	**1.50E-03**	**1.33E+00**
Manganese[e]	2780.00	1.31E-03	1.40E-01	9.33E-03
Mercury	57.90	2.72E-05	1.60E-04	1.70E-01
Silver	213.00	1.00E-04	5.00E-03	2.00E-02
Zinc	768.00	3.61E-04	3.00E-01	1.20E-03

Bold =COC
[a] Maximum exposure point concentration in sediments
[b] Calculations use Gold Panner/ Rock Hound Exposure Parameters
[c] HQ = Exposure/Chronic Reference Dose (RfD)
[d] Cadmium oral RfD is for specific to food (solid) intake
[e] Manganese oral RfD is specific to dietary intake

Table J-8. Recreational Gold Panner/Rock Hound Child Exposure to Sediment and the Resulting Hazard Quotients Black Pine Mine

COPCs	Exposure Point Concentration in Sediment[a] (EPCs) (mg/kg)	Exposure[b] (mg/kg-day)	Chronic RfD (mg/kg-day)	Hazard Quotient (HQ)[c]
		Ingestion	Oral	Oral
Antimony	**891.00**	**8.14E-04**	**4.00E-04**	**2.03E+00**
Arsenic	**642.00**	**5.86E-04**	**3.00E-04**	**1.95E+00**
Cadmium[d]	32.50	2.97E-05	1.00E-03	2.97E-02
Copper	5320.00	4.86E-03	4.00E-02	1.21E-01
Iron	37400.00	3.42E-02	7.00E-01	4.88E-02
Lead	**4240.00**	**3.87E-03**	**1.50E-03**	**2.58E+00**
Manganese[e]	2780.00	2.54E-03	1.40E-01	1.81E-02
Mercury	57.90	5.29E-05	1.60E-04	3.30E-01
Silver	213.00	1.95E-04	5.00E-03	3.89E-02
Zinc	768.00	7.01E-04	3.00E-01	2.34E-03

Bold =COC
[a] Maximum exposure point concentration in sediments
[b] Calculations use Gold Panner/ Rock Hound Expsoure Parameters
[c] HQ = Exposure/Chronic Reference Dose (RfD)
[d] Cadmium oral RfD is for specific to food (solid) intake
[e] Manganese oral RfD is specific to dietary intake

Table J-9. Recreational Fisherman Adult Exposure to Fish Consumption and the Resulting Hazard Quotients Black Pine Mine

COPCs	Exposure Point Concentration in Water[a] (EPCs) (µg/L)	Exposure[b] (mg/kg-day)	Chronic RfD (mg/kg-day)	Hazard Quotient (HQ)[c]
		Ingestion	Oral	Oral
Antimony	117.00	2.17E-05	4.00E-04	5.43E-02
Arsenic	36.00	2.94E-04	3.00E-04	9.81E-01
Cadmium[d]	1.20	1.81E-05	1.00E-03	1.81E-02
Chromium III	2.90	8.62E-06	1.50E+00	5.75E-06
Copper	221.00	8.21E-03	4.00E-02	2.05E-01
Iron	2,990.00	5.55E-04	7.00E-01	7.93E-04
Lead	49.00	4.46E-04	1.50E-03	2.97E-01
Manganese[e]	52.60	4.69E-04	1.40E-01	3.35E-03
Mercury	**2.52**	**2.57E-03**	**1.60E-04**	**1.61E+01**
Nickel	4.20	3.67E-05	2.00E-02	1.83E-03
Silver	0.64	1.19E-07	5.00E-03	2.38E-05
Zinc	63.10	5.51E-04	3.00E-01	1.84E-03

Bold = COC
[a] Maximum exposure point concentration in surface waters excluding seep discharge
[b] Exposure calculations use Fisherman Exposure Parameters
[c] HQ = Exposure/Chronic Reference Dose (RfD)
[d] Cadmium oral RfD is for specific to food (solid) intake
[e] Manganese oral RfD is specific to dietary intake

Table J-10. Estimated Lifetime Cancer Risks for Gold Panner/Rock Hound Recreationalist from Tailings, Waste Rock, and Soils
Black Pine Mine

Carcinogen COPCs	Exposure Point Concentration[a] (mg/kg)	Lifetime Exposure (mg/kg-day)			Slope Factor (mg/kg-d)$^{-1}$ or (ug/cu.m)			Estimated Lifetime Cancer Risk[b]				Source
		Ingestion	Dermal	Inhalation	Oral	Dermal	Inhalation	Oral	Dermal	Inhalation	Total ELCR	
Arsenic	**786.02**	**1.88E-04**	**1.25E-04**	**1.76E-09**	**1.50E+00**	**1.50E+00**	**1.50E+00**	**2.82E-04**	**1.87E-04**	**2.63E-09**	**4.70E-04**	EPA IRIS 1998
Cadmium	16.99	4.07E-06	9.01E-08	3.80E-11	NA	NA	1.80E-03			6.83E-14	6.83E-14	EPA IRIS 1994
Lead	**3,572.93**	**8.55E-04**	**1.89E-04**	**7.98E-09**	**8.50E-03**	**8.50E-03**	**NA**	**7.27E-06**	**1.61E-06**		**8.88E-06**	DEQ RBCG; CALEPA 2005

Bold = Carcinogen COC
[a] Maximum concentration per COPC of the arithmetic mean of the COPC concentration in tailings from the Combination Mill AOC or waste rock from Combination Mine AOC
[b] Estimated Lifetime Cancer Risk = Lifetime Exposure * Slope Factor; Cancer Risk greater than 1x10-6 is unacceptable (EPA 2004b)

Table J-11. Estimated Lifetime Cancer Risks for Gold Panner/Rock Hound Recreationalist from Surface Waters, Excluding Seep Discharge
Black Pine Mine

Carcinogen COPCs	Exposure Point Concentration[a] (µg/L)	Lifetime Exposure (mg/kg-day)		Slope Factor (mg/kg-d)$^{-1}$ or (ug/cu.m)		Estimated Lifetime Cancer Risk[b]			Source
		Ingestion	Dermal	Oral	Dermal	Oral	Dermal	Total ELCR	
Arsenic	**36.00**	**5.23E-05**	**4.89E-07**	**1.50E+00**	**1.50E+00**	**7.85E-05**	**7.34E-07**	**7.92E-05**	EPA IRIS 1995; CALEPA 2005
Cadmium	1.20	1.74E-06	1.63E-08	NA	NA				EPA IRIS 1996
Lead	49.00	3.84E-05	1.73E-08	8.50E-03	8.50E-03	3.26E-07	1.47E-10	3.26E-07	DEQ RBCG; CALEPA 2005

Bold = Carcinogen COC
[a] Maximum sample point concentration for surface waters, excluding adit discharge
[b] Estimated Lifetime Cancer Risk = Lifetime Exposure * Slope Factor; Cancer Risk greater than 1x10-6 is unacceptable (EPA 2004b)

Table J-12. Estimated Lifetime Cancer Risks for Gold Panner/Rock Hound Recreationalist from Sediment Black Pine Mine

Carcinogen COPCs	Exposure Point Concentration[a] (mg/kg)	Lifetime Exposure (mg/kg-day) Ingestion	Slope Factor $(mg/kg\text{-}d)^{-1}$ or (ug/cu.m) Oral	Estimated Lifetime Cancer Risk[b] Oral	Source
Arsenic	**642.00**	**1.54E-04**	**1.50E+00**	**2.30E-04**	EPA IRIS 1998
Cadmium	32.50	7.78E-06	NA		EPA IRIS 1994
Lead	**4240.00**	**1.01E-03**	**8.50E-03**	**8.62E-06**	DEQ RBCG; CALEPA 2005

Bold = Carcinogen COC

[a] Maximum exposure point concentration in sediment

[b] Estimated Lifetime Cancer Risk = Lifetime Exposure * Slope Factor; Cancer Risk greater than 1x10-6 is unacceptable (EPA 2004b)

Table J-13. Estimated Lifetime Cancer Risks for Gold Panner/Rock Hound Recreationalist from Fish Consumption Black Pine Mine

Carcinogen COPCs	Exposure Point Concentration[a] (µg/L)	Exposure (mg/kg-day) Ingestion	Slope Factor $(mg/kg\text{-}d)^{-1}$ Oral	Estimated Lifetime Cancer Risk[b]	Source
Arsenic	**117.00**	**4.10E-04**	**1.50E+00**	**6.15E-04**	EPA IRIS 1991
Cadmium	86.70	3.80E-02	NA		EPA IRIS 2005; EPA HEAST 1997
Lead	**2,990.00**	**1.17E-02**	**8.50E-03**	**9.91E-05**	EPA PPRTV 2006

Bold = Carcinogen COC

[a] Maximum exposure point concentration in surface waters, excluding seep discharge

[b] Estimated Lifetime Cancer Risk = Lifetime Exposure * Slope Factor; ELCR greater than $1x10^{-6}$ is unacceptable (EPA 2004b)

APPENDIX K

ECOLOGICAL RISK ASSESSMENT

Table K-1. Exposure Point Concentrations used in Exposure Calculations for the three different scenarios in the Black Pine Mine Ecological Risk Assessment
Black Pine Mine

COPC	Aquatic Life Surface Water Conc. µg/L[b]	Associated Water Hardness mg/L[c] $CaCO^3$	Sediment Conc. mg/kg[d]	Deer Ingestion Water Conc. µg/L[e]	Deer Ingestion/ Phytotoxicity Soil, Tailings, or Waste Rock Surface Conc. mg/kg[f]	Contaminant of Potential Concern
Aluminum	----	25	---	----	----	Unk
Antimony	117.00	25	891.00	117.00	875.99	Y
Arsenic	36.00	25	642.00	54.70	786.02	Y
Barium	86.70	25	800.00	86.70	334.37	N
Cadmium	1.20	25	32.50	215.00	16.99	Y
Chromium III	2.90	25	25.8	2.90	5.60	Y
Colbalt[a]	NA	25	23.7	NA	5.87	N
Copper	221.00	25	5320.00	20900.00	2553.30	Y
Iron	2990.00	25	37400.00	41400.00	23933.00	Y
Lead	49.00	25	4240.00	363.00	3572.93	Y
Manganese	52.60	25	2780.00	6640.00	772.67	Y
Mercury	2.52	25	57.90	2.52	26.45	Y
Nickel	4.20	25	31.20	4.20	5.08	Y
Silver	0.64	25	213.00	0.64	67.77	Y
Zinc	63.10	25	768.00	20400.00	405.66	Y
Note: Minimum hardness=25 mg/L; Maximum=400 mg/L						

Bold = COPC
[a] No analytical results available, NA
[b] Maximum concentration per COPC for surface water, excluding seep discharge
[c] Hardness results for surface water were all < 25 mg/kg CaCO3; therefore the minimum hardness value of 25 was used
[d] Maximum concentration per COPC for sediment
[e] Maximum concentration per COPC for surface waters including seep discharge
[f] Maximum concentration per COPC of the arithmetic means from the COPC concentrations in tailings at the Combination Mill AOC or waste rock at the Combination Mine AOC
Unk = Unkown

Table K-2. Aquatic Ecological Impact Quotients for Acute and Chronic Health Effects from Exposure to Surface Waters, excluding Seep Discharge Black Pine Mine

COPC	Acute Criteria* µg/L	Chronic Criteria* µg/L	Acute Ecological Impact Quotient (EQ)	Chronic Ecological Impact Quotient (EQ)
Aluminum	750.0	87.0	NA	NA
Antimony	NA	NA	NA	NA
Arsenic	340.0	150.0	0.106	0.240
Cadmium**	0.52	0.097	**2.303**	**12.385**
Chromium III**	579.3	27.7	0.005	0.105
Copper**	3.79	2.85	**58.285**	**77.450**
Iron	NA	1000.0	NA	2.990
Lead**	13.98	0.545	**3.505**	**89.944**
Manganese	NA	NA	NA	NA
Mercury	1.7	0.91	**1.482**	**2.769**
Nickel**	145.2	16.1	0.029	0.260
Silver**	0.374	NA	**1.711**	NA
Zinc**	37.0	37.0	**1.705**	**1.705**
TOTAL			69.130	187.848

Bold = COC
*Aquatic Life Standards are from DEQ's Circular DEQ-7 Montana Numeric Water Quality Standards (WQB-7), 2010
**Aquatic Life Standards did not have to be adjusted for hardness, all hardness measured in chemical analyses of surface water samples taken from Black Pine Mine Site resulted in values less than 25 mg/L $CaCO_3$.

Table K-3. Aquatic Ecological Impact Quotients for Moderate Range Biological Effects from Exposure to Sediments
Black Pine Mine

COPC	SQG Effects Range-Moderate* (mg/kg)	Sediment Ecological Impact Quotient (EQ)
Arsenic	70.0	**9.17**
Cadmium	906.0	0.04
Chromium III	370.0	0.07
Copper	270.0	**19.70**
Lead	218.0	**19.45**
Mercury	0.7	**81.55**
Nickel	51.6	0.60
Silver	3.7	**57.57**
Zinc	410.0	**1.87**
TOTAL		190.02

Bold = COC
*From NOAA, 1999; Sediment quality guidelines-moderate effects range for biological effects in aquatic life

Table K-4. Deer Ingestion Ecological Impact Quotients for Whitetail Deer as the Representative Terrestrial Wildlife Species from Ingestion of Soil and Surface Water, including Seep Discharge
Black Pine Mine

COPC	Deer Intake Dose Est. Soil and Water [a, b] (mg/kg-day) E_{COPC}	NOAELs or Toxic Thresholds Values[c] (mg/kg-day)	Deer Ingestion EQ	Toxic Endpoint Source
Aluminum	NA	0.294	NA	Sample et. al, 1996
Antimony	1.006	0.019	52.956	Sample et. al, 1996
Arsenic	0.900	0.019	47.343	Sample et. al, 1996
Barium	0.387	1.5	0.258	Sample et. al, 1996
Cadmium	0.033	0.271	0.123	Sample et. al, 1996
Chromium	0.007	768	0.000	Sample et. al, 1996
Copper	4.279	4.3	0.995	Sample et. al, 1996
Lead	4.096	0.005	819.274	ATSDR, 1993
Manganese	1.316	25	0.053	Sample et. al, 1996
Mercury	0.030	0.36	0.084	Sample et. al, 1996
Nickel	0.006	11.22	0.001	Sample et. al, 1996
Zinc	1.798	44.9	0.040	Sample et. al, 1996
TOTAL			921.1266	

Bold = COC

[a] Exposure parameters were obtained from Sample and Suter II 1994

[b] Maximum concentration per COPC of the arithmetic means from the COPC concentration in tailings at the Combination Mill AOC or waste rock at the Combination Mine AOC were used for the exposure point concentration in soil ingestion exposure calculations; the maximum surface water concentration for each COPC, including seep discharge, was used for the exposure point concentration in exposure calculations

[c] The most recent and most conservative estimated NOAELs are used for toxic threshold values

Table K-5. Phytotoxicity Ecological Impact Quotients for Terrestrial Plants from Exposures to Tailings, Waste Rock, and Soils Black Pine Mine

COPC	Phytotoxic Soil Conc.[a] mg/kg	Phytotoxicity Ecological Impact Quotients (EQ)[b]
Arsenic	10	**78.60**
Cadmium	3	**5.66**
Copper	60	**42.56**
Lead	50	**71.46**
Mercury	5	**5.29**
Zinc	50	**8.11**
TOTAL		211.68

Bold = COC

[a] Most conservative phytotoxicity criteria in soil concentrations from CH2MHill (1987) (Hg); Efroymson et al. (1997) (As, Pb, Zn); and Kabata-Pemdias (1992) (Cd, Cu)

[b] Maximum concentration per COPC of the arithmetic means from the COPC concentrations in tailings at the Combination Mill AOC or waste rock at Combination Mine AOC were used for the exposure point concentration in soil ingestion exposure calculations

Table K-6. Summary of All Ecological Impact Quotients for All Ecological Receptors and All Exposure Pathways
Black Pine Mine

COPC	Aquatic Life-Surface Water EQ	Aquatic Life-Sediment EQ	Deer Ingestion- Soil and Water EQ	Plant Phytotoxicity EQ	Total EQ by COPC
Antimony	NA	NA	**52.96**	NA	52.96
Arsenic	0.11	**9.17**	**47.34**	**78.60**	135.22
Cadmium	**2.30**	0.04	0.12	**5.66**	8.13
Chromium III	0.01	0.07	0.00	NA	0.08
Copper	**58.28**	**19.70**	0.995	**42.56**	121.54
Iron	NA	NA	NA	NA	NA
Lead	**3.51**	**19.45**	**819.27**	**71.46**	913.69
Manganese	NA	NA	0.05	NA	0.05
Mercury	**1.48**	**81.55**	0.08	**5.29**	88.40
Nickel	0.03	0.60	0.00	NA	0.63
Silver	**1.71**	**57.57**	NA	NA	59.28
Zinc	**1.70**	**1.87**	0.04	**8.11**	11.73
TOTAL	69.13	190.02	921.13	211.68	1391.89

Bold = COC

APPENDIX L

FIELD NOTES AND REPOSITORY TEST PITS AND BOREHOLE LOGS

Lithology Log Sheet 1 of 2

LOCATION ID: Combination Mill - Repository

Project Name	Project Number	Site ID
Black Pine Mine	776-012-002	CML-TS-11

Excavation Company	Operator	Ground Elevation	Total Depth
Mungas Co	Karl Konrad		14.5 feet-bgs

Equipment	Weather	Temperature	Date/Time Started	Date/Time Total Depth Reached
322B	Sunny	50	7/15/11 0710	

Sampler	Water Level (bgs)	
Darnell/Svendsen/Catarra	First 5 feet-bgs	
	Hydrogeologist	Checked by/Date

Location Description (include sketch in field logbook)

Depth	Interval	Recovery	Blow Counts	Description (Include lithology, grain size, sorting, angularity, Munsell color name & notation, minerology, bedding, plasticity, density, consistency, etc., as applicable)	USCS Code	Lithology	Water Content	Estimate % of Gr	Sa	Fi	Remarks (Include all sample types & depth, odor, organic vapor measurements, etc.)
0				0-2' Sandy SILT, with gravel, brown							BP-CML-TS-11-01 (geochemical sample)
1											
2				2- 14.5' Clayey GRAVEL, with sand and cobbles, dark yellowish brown	GC						
3											
4											
5				-- groundwater seeping into pit at upslope (west) end at ~ 5 feet							
6											
7											
8								38	27	35	BP-CML-TS-11-08 (geochemical and geotechnical samples)
9											
10											

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Lithology Log (continued) Site ID: CML-TS-11 Sheet 2 of 2

LOCATION ID
Combination Mill - Repository

Depth	Interval	Recovery	Blow Counts	Description (Include lithology, grain size, sorting, angularity, Munsell color name & notation, minerology, bedding, plasticity, density, consistency, etc., as applicable)	ASTM Code	Lithology	Water Content	Estimate % of Gr	Sa	Fi	Remarks (Include all sample types & depth, odor, organic vapor measurements, etc.)
10				2- 14.5' Clayey GRAVEL, with sand and cobbles, dark yellowish brown (continued)							
11											
12											
13											
14											bedrock not encountered
				Bottom of excavation: 14.5 ft bgs							
15											
16											
17											
18											
19											
20											
21											
22											
23											

Lithology Log Sheet 1 of 1

LOCATION ID: Repository #1

Project Name	Project Number	Site ID
Black Pine Mine	776-012-002	RY-SS-01

Excavation Company	Operator	Ground Elevation	Total Depth
Mungas Co	Karl Konrad		4.3 feet-bgs

Equipment	Weather	Temperature	Date/Time Started	Date/Time Total Depth Reached
322 B	Sunny	56 F	7/12/11 0912	7/12/11 0918

Sampler	Water Level (bgs)	
Mongoven	First __ feet-bgs	none while digging
	Hydrogeologist	Checked by/Date

Location Description (include sketch in field logbook)

Depth	Interval	Recovery	Blow Counts	Description (Include lithology, grain size, sorting, angularity, Munsell color name & notation, minerology, bedding, plasticity, density, consistency, etc., as applicable)	USCS Code	Lithology	Water Content	Estimate % of Gr	Sa	Fi	Remarks (Include all sample types & depth, odor, organic vapor measurements, etc.)
0				0 - 0.5' Highly weathered bedrock - Silty GRAVELS, with Sand, trace roots and Mn staining, gravel is siliceous shale, dk brown, with reddish brown gravels, dry	GM		4.0	62	20	18	RY-SS-01 (0-1') (geochemical) RY-SS-01-00 (0 - 1.3') (geotechnical)
1				0.5 - 4.2' Weathered bedrock - well graded GRAVEL, with Silt, Sand, & Cobbles, dark brown and purple, cobbles are shale, slightly moist	GW-GM		2.7	73	22.0	5.2	RY-SS-01-02 (1.3 - 2.7') (geotechnical)
2											
3											
4				4.2' - SHALE, reddish purple							excavator refusal
				Bottom of excavation at 4.3'							backfilled
5											
6											
7											
8											
9											
10											

Lithology Log Sheet 1 of 1

LOCATION ID: Repository #1

Project Name	Project Number	Site ID
Black Pine Mine	776-012-002	RY-SS-02

Excavation Company	Operator	Ground Elevation	Total Depth
Mungas Co	Karl Konrad		2.7 feet-bgs

Equipment	Weather	Temperature	Date/Time Started	Date/Time Total Depth Reached
322 B	Sunny	58 F	7/12/11 0830	7/12/11 0840

Sampler	Water Level (bgs)	
Mongoven	First __ feet-bgs	none while digging
	Hydrogeologist	Checked by/Date

Location Description (include sketch in field logbook)

Depth	Interval	Recovery	Blow Counts	Description (Include lithology, grain size, sorting, angularity, Munsell color name & notation, minerology, bedding, plasticity, density, consistency, etc., as applicable)	USCSCode	Lithology	Water Content	Estimate % of Gr	Sa	Fi	Remarks (Include all sample types & depth, odor, organic vapor measurements, etc.)
0				0-0.5' Highly fractured weathered SHALE, reddish brown to purple, dry, dark brown silt topsoil fills fractures in shale	GW-GM		4.3	85.9	6.7	7.4	RY-SS-02-00 (0 - 0.5') (geochemical and geotechnical)
1				0.5-2.7' Fractured weathered SHALE, purple to reddish brown, dry, dark brown silt fills fractures	GM		6.8	61.7	10.8	14.1	RY-SS-02-01 (0.5 - 2.7') (geochemical and geotechnical)
2				2.7' - SHALE							excavator refusal
3				Bottom of excavation at 2.7'							backfilled
4											
5											
6											
7											
8											
9											
10											

Lithology Log Sheet 1 of 2

LOCATION ID: Repository #2

Project Name	Project Number	Site ID
Black Pine Mine	776-012-002	RY-SS-03

Excavation Company	Operator	Ground Elevation	Total Depth
Mungas Co	Karl Konrad		14 feet-bgs

Equipment	Weather	Temperature	Date/Time Started	Date/Time Total Depth Reached
322 B	Sunny	60 F	7/12/11 1000	7/12/11 1040

Sampler	Water Level (bgs)	
Mongoven	First __ feet-bgs	none while digging

	Hydrogeologist	Checked by/Date

Location Description (include sketch in field logbook)

Depth	Interval	Recovery	Blow Counts	Description (Include lithology, grain size, sorting, angularity, Munsell color name & notation, minerology, bedding, plasticity, density, consistency, etc., as applicable)	USCS Code	Lithology	Water Content	Estimate % of Gr	Sa	Fi	Remarks (Include all sample types & depth, odor, organic vapor measurements, etc.)
0				0 - 2' Topsoil / Colluvium - Silty GRAVEL, trace sand and roots, dark brown, damp the silt is slightly micaceous	GM		3.8	57.0	13.4	29.6	RY-SS-03-00 (0 - 1.5') (geochemical and geotechnical)
1											
2				2' - Weathered Shale Bedrock - Silty, Clayey COBBLES and GRAVEL, with sand, trace Mn coating and iron staining, dark reddish brown and brown, damp	GC-GM						
3											
4											
5											
6											
7											
8											
9											
10											

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Lithology Log (continued) Sheet 2 of 2

Repository #2
RY-SS-03-01

Depth	Interval	Recovery	Blow Counts	Description (Include lithology, grain size, sorting, angularity, Munsell color name & notation, minerology, bedding, plasticity, density, consistency, etc., as applicable)	ASTM Code	Lithology	Water Content	Estimate % of Gr	Sa	Fi	Remarks (Include all sample types & depth, odor, organic vapor measurements, etc.)
10				2' - Weathered Shale Bedrock - Silty, Clayey COBBLES and GRAVEL, with sand, trace Mn coating and iron staining, dark reddish brown and brown, damp (continued)							
11											Hard digging
12											
13				-- black manganese streaking on cobbles @ ~ 13'	GC-GM		10.1	41.8	10.5	23.4	RY-SS-03-01 (13') (geochemical and geotechnical)
14				-- excavator refusal at 14' Bottom of excavation at 14'							backfilled
15											
16											
17											
18											
19											
20											
21											
22											
23											

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Lithology Log Sheet 1 of 1

LOCATION ID: Repository #2

Project Name	Project Number	Site ID
Black Pine Mine	776-012-002	RY-SS-04

Excavation Company	Operator	Ground Elevation	Total Depth
Mungas Co	Karl Konrad		10.5 feet-bgs

Equipment	Weather	Temperature	Date/Time Started	Date/Time Total Depth Reached
322 B	Sunny	60 F	07/12/11 1110	7/12/11 1140

Sampler	Water Level (bgs)	
Mongoven	First 33 inches-bgs	
	Hydrogeologist	Checked by/Date

Location Description (include sketch in field logbook)

Depth	Interval	Recovery	Blow Counts	Description (Include lithology, grain size, sorting, angularity, Munsell color name & notation, minerology, bedding, plasticity, density, consistency, etc., as applicable)	USCS Code	Lithology	Water Content	Estimate % of Gr	Sa	Fi	Remarks (Include all sample types & depth, odor, organic vapor measurements, etc.)
0				0 - 0.8' Duff & Topsoil -Well graded GRAVEL with silt and organics, dark brown, dry	GW-GM		7.5	80.9	12.6	6.5	RY-SS-04 (0-1') (geochemical) RY-SS-04-00 (0-1.5') (geotechnical)
1				0.8 - 3' Colluvium - Silty SAND with cobbles and gravel, trace organics, dark brown, damp, weathered bedrock							
2											RY-SS-04 (2-4') (geochemical)
3				-- wet seam at ~ 33"							
4				3' - Weathered Shale - Silty, Clayey COBBLES and GRAVEL, with Sand, trace iron staining, reddish brown and yellowish brown, with purple fines, silt is micaceous, damp	GC-GM						Some rocks can be broken by hand
5											
6											
7											
8				-- Weathered Shale competency increasing at ~ 8'			5.5	43.5	17.9	38.5	RY-SS-04-01 (8') (geotechnical) Hard digging
9											RY-SS-04 (10-12') (geochemical)
10				Bottom of excavation at 10.5'							10.5' stopped digging

Lithology Log Sheet 1 of 1

LOCATION ID: Repository #3

Project Name	Project Number	Site ID
Black Pine Mine	776-012-002	RY-SS-05

Excavation Company	Operator	Ground Elevation	Total Depth
Mungas Co	Karl Konrad		5 feet-bgs

Equipment	Weather	Temperature	Date/Time Started	Date/Time Total Depth Reached
322 B	Sunny	65 F	7/12/11 1205	7/12/11 1216

Sampler	Water Level (bgs)	
Mongoven	First __ feet-bgs	none while digging

	Hydrogeologist	Checked by/Date

Location Description (include sketch in field logbook)

Depth	Interval	Recovery	Blow Counts	Description (Include lithology, grain size, sorting, angularity, Munsell color name & notation, minerology, bedding, plasticity, density, consistency, etc., as applicable)	USCS Code	Lithology	Water Content	Estimate % of Gr	Sa	Fi	Remarks (Include all sample types & depth, odor, organic vapor measurements, etc.)
0				0 - 0.5' Topsoil - Sandy SILT, with organics, dark brown, dry							RY-SS-05 (0-1') (geochemical)
1				0.5 - 2' Weathered bedrock - Silty GRAVEL, with cobbles, trace organics, purple gravel and dark brown silt, dry gravels have manganese coating	GM		4.2	71	12	17	RY-SS-05-00 (0.5 - 1.5') (geotechnical)
2				2' - Weathered, fractured bedrock - well graded GRAVEL, with cobbles, reddish brown and purple, slightly moist fractures have a silt coating	GW						RY-SS-05 (2-4') (geochemical)
3											
4											
5				-- excavator refusal at 5'			4.1	78	6.6	2.2	RY-SS-05-01 (5') (geotechnical)
				Bottom of excavation at 5'							backfilled
6											
7											
8											
9											
10											

SOIL BORING AND MONITORING WELL CONSTRUCTION RECORD

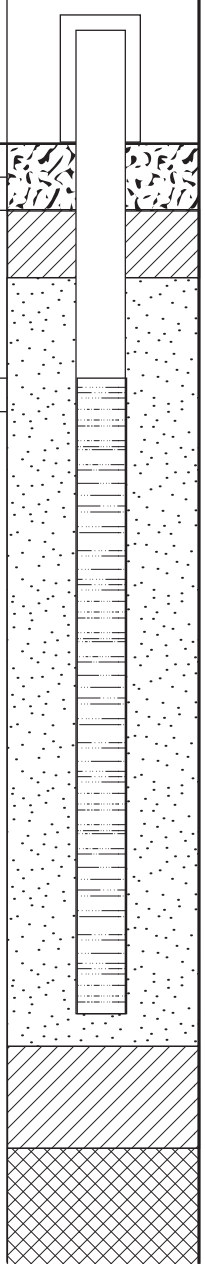
Boring # BP-RY-06
Total depth: 28 feet
Sheet 1 of 2

Project name:	Black Pine Mine	Drilling Contractor:	Boland Drilling	Well installed (y/n):	Yes
Project number:	06-03425-011	Drilling method:	Hollow-stem auger	Casing material:	PVC Sch 40
Client:	MDEQ	Sampling method:	2' split spoon for continuous sampling	Casing diameter:	2-inch
Location:	Center of Repository			Screen slot width:	10 slot
		Measuring point elev.:	6,290 feet HAE	Casing joint type:	Flush-threaded
HEC rep.:	BH	Ground elevation:	6,287 feet HAE	Filter pack:	#10-20 sand
Start Date:	08-16-2011	Air monitoring (y/n):	No	Annular seal:	Bentonite chips
Compl. Date:	08-16-2011	Instrument(s):	NA	Monument type:	3' metal stick-up

Depth to water	Dry Hole		
Reference point			
Date			

Monitoring well details
Cement | Filterpack | Native
Bentonite | Well screen

Sample type, interval	% recovery	Depth (feet, BGS)		Soil description	Geotechnical sample	Sample collected BY-RY-06-
2' - 3" diameter split spoon	100	1	ML	Light brown to reddish tan w/purple gravel (shale), gravelly SILT, trace sand, dry		00
		2	GP	Purple GRAVEL, dry		
2' - 2" diameter split spoon	40	3		Reddish brown lean CLAY with purple gravel, moist (highly weathered shale bedrock)		
		4				04
2' - 3" diameter split spoon	100	5				
		6				
2' - 2" diameter split spoon	90	7				
		8				
2' - 3" diameter split spoon	100	9				
		10	CL			
2' - 2" diameter split spoon	90	11				
		12		Reddish brown gravelly lean CLAY, Damp		
2' - 3" diameter split spoon	100	13				
		14				
2' - 2" diameter split spoon	30	15				
		16		Reddish brown lean CLAY with gravel, moist to damp		



Continued on sheet 2

SOIL BORING AND MONITORING WELL CONSTRUCTION RECORD

Boring # BP-RY-06
Total depth: 28 feet
Sheet 2 of 2

Sample type, interval	% recovery	Depth (feet, BGS)		Soil description	Geotechnical sample	Sample collected BY-RY-06-	Monitoring well details
2' - 3" diameter split spoon	100	17	CL	Reddish brown lean CLAY with gravel, moist to damp			
		18		Reddish brown and purple gravelly SILT, dry, formation tightens (weathered shale bedrock)			
2' - 2" diameter split spoon	100	19					
		20		Gravel increases in size			
2' - 3" diameter split spoon	90	21					
		22	ML				
2' - 2" diameter split spoon	100	23		Reddish brown and purple gravelly SILT, trace clay, damp			
		24		Dry			
2' - 3" diameter split spoon	90	25					
		26		Red, yellow, and black inclusions present, weathered and brittle			
2' - 2" diameter split spoon	100	27		Brown to reddish brown SHALE, dry, highly compacted			
		28		Refusal at 28' bgs			

SOIL BORING AND MONITORING WELL CONSTRUCTION RECORD

Boring # BP-RY-07
Total depth: 26 feet
Sheet 1 of 2

Project name:	Black Pine Mine	Drilling Contractor:	Boland Drilling	Well installed (y/n):	Yes
Project number:	06-03425-011	Drilling method:	Hollow-stem auger	Casing material:	PVC Sch 40
Client:	MDEQ	Sampling method:	2' split spoon for continuous sampling	Casing diameter:	2-inch
Location:	Down slope of Repository			Screen slot width:	10 slot
		Measuring point elev.:	6,264 feet HAE	Casing joint type:	Flush-threaded
HEC rep.:	BH	Ground elevation:	6,261 feet HAE	Filter pack:	#10-20 sand
Start Date:	08-17-2011	Air monitoring (y/n):	No	Annular seal:	Bentonite chips
Compl. Date:	08-17-2011	Instrument(s):	NA	Monument type:	3' metal stick-up

Depth to water	Dry Hole		
Reference point			
Date			

Monitoring well details
Cement, Filterpack, Native, Bentonite, Well screen

Sample type, interval	% recovery	Depth (feet, BGS)		Soil description	Geotechnical sample	Sample collected BY-RY-07-	Monitoring well details
2' - 3" diameter split spoon	80	1	ML	Dark brown gravelly SILT with sand, dry (organic layer)			
						00	
		2		Light tan gravelly SILT with clay, dry Light brown gravelly SILT, trace clay, dry			
2' - 2" diameter split spoon	60	3					
		4		Reddish brown lean CLAY with gravel, damp (purple shale gravel) (highly weathered shale bedrock)			
2' - 3" diameter split spoon	100	5					
		6					
2' - 2" diameter split spoon	5	7					
		8		Purplish gray shale stuck in tip of sampler			
2' - 3" diameter split spoon	5	9	CL				
		10		Purplish gray shale stuck in tip of sampler Reddish brown gravelly lean CLAY, damp, stiff			
2' - 2" diameter split spoon	100	11				10	
		12					
2' - 3" diameter split spoon	50	13					
		14					
2' - 2" diameter split spoon	100	15					
		16		Formation tightens			

Continued on sheet 2

SOIL BORING AND MONITORING WELL CONSTRUCTION RECORD

Boring # BP-RY-07
Total depth: 26 feet
Sheet 2 of 2

Sample type, interval	% recovery	Depth (feet, BGS)		Soil description	Geotechnical sample	Sample collected BY-RY-07-	Monitoring well details
2' - 3" diameter split spoon	100	17					
		18		Reddish brown lean CLAY with gravel, damp (weathered shale bedrock)			
2' - 2" diameter split spoon	100	19		Reddish brown and purple gravelly lean CLAY, damp			
		20					
2' - 3" diameter split spoon	100	21		Reddish brown and purple lean CLAY with gravel, damp			
		22		Formation tightens, drill rig begins overheating			
2' - 2" diameter split spoon	100	23		Auger refusal at 22' bgs. Split spoon sampler was able to collect soil from 22' to 26' bgs.			
		24		Gravel has black, yellow, and gray inclusions, purple shale present, damp			
2' - 3" diameter split spoon	100	25					
		26					

SOIL BORING AND MONITORING WELL CONSTRUCTION RECORD

Boring # BP-RY-08
Total depth: 10 feet
Sheet 1 of 1

Project name:	Black Pine Mine	Drilling Contractor:	Boland Drilling	Well installed (y/n):	Yes
Project number:	06-03425-011	Drilling method:	Hollow-stem auger	Casing material:	PVC Sch 40
Client:	MDEQ	Sampling method:	2' split spoon for continuous sampling	Casing diameter:	2-inch
Location:	East side of Repository			Screen slot width:	10 slot
		Measuring point elev.:	6,326 feet HAE	Casing joint type:	Flush-threaded
HEC rep.:	BH	Ground elevation:	6,323 feet HAE	Filter pack:	#10-20 sand
Start Date:	08-17-2011	Air monitoring (y/n):	No	Annular seal:	Bentonite chips
Compl. Date:	08-17-2011	Instrument(s):	NA	Monument type:	3' metal stick-up

Depth to water	Dry Hole		
Reference point			
Date			

Monitoring well details
Cement, Filterpack, Weathered bedrock, Bentonite, Well screen

Sample type, interval	% recovery	Depth (feet, BGS)		Soil description	Geotechnical sample	Sample collected BY-RY-08-	Monitoring well details
2' - 3" diameter split spoon	80	1	ML	Light gray to light brown gravelly SILT with organics, dry		00	
		2	GM	Tan to light gray silty GRAVEL, dry (highly weathered shale bedrock)			
2' - 2" diameter split spoon	20	3					
		4	ML	Brown to reddish brown gravelly SILT, trace clay, damp (highly weathered shale bedrock)			
2' - 3" diameter split spoon	100	5	GM	Tan to light brown silty GRAVEL, dry (weathered shale bedrock)			
		6		Pink, white, and yellow gravels present (5-1/2 to 6' bgs)			
2' - 2" diameter split spoon	100	7	Bedrock	Pink to white SHALE, fractured, dry (weathered bedrock)			
			GM	Brown to reddish brown silty GRAVEL, trace clay, damp			
		8	Bedrock	White to light gray SHALE, fractured, dry (weathered bedrock)			
			ML	Brown clayey SILT with gravel, damp			
2' - 3" diameter split spoon	50	9	Bedrock	Purple to gray SHALE			
		10		Refusal at 10' bgs			

Borehole Log

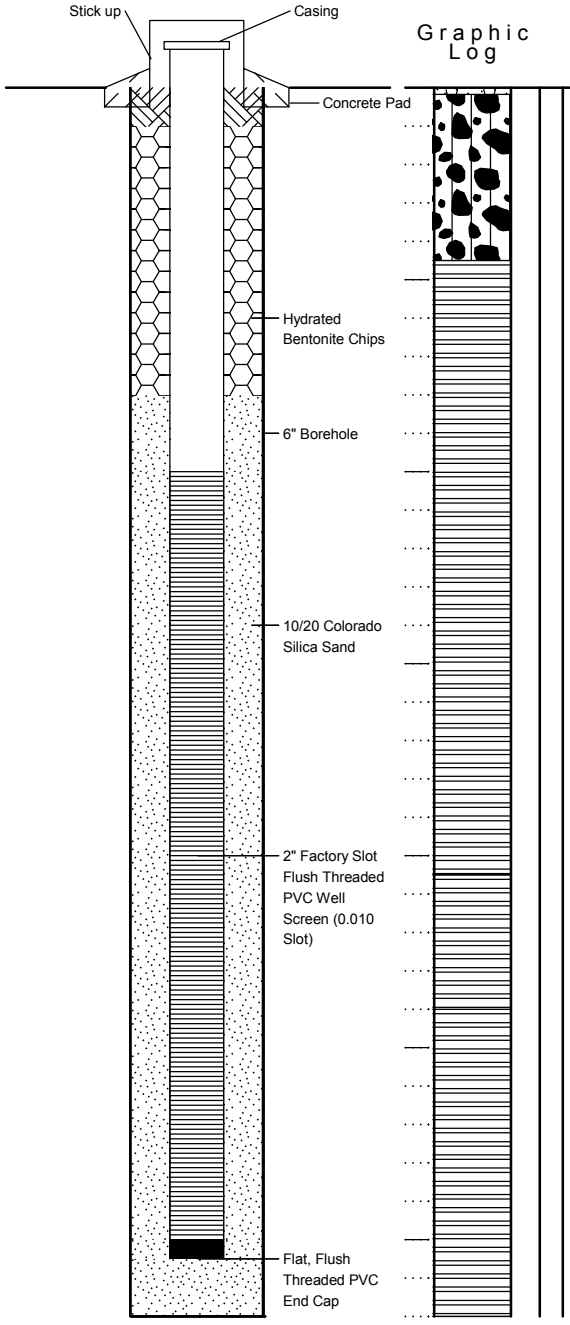
Borehole: **MW-RY-09**

Trihydro CORPORATION

Client: **Montana Department of Environmental Quality - Abandoned Mines Section**		
Date Started: **Jan 27, 12**	Date Completed: **Jan 27, 12**	Permit Number:
Logged By: **Tom Smith**	Driller: **Steve Malkovich**	1/4, 1/4, S, T, R:
Drilling Co.: **O' Keefe Drilling**	Drilling Rig: **R650**	Borehole Diameter: **6"**
Method: **Air rotary**	Measuring Point Elev. (ft.-msl): **6307.00**	Sample Type: **Chips**
Total Depth (ft): **32**	Ground Surface Elev. (ft.-msl): **6304.0**	Location: **~39' SW of MW-RY-07, Casing stick up at 33.25"**

N

CONSTRUCTION | **SAMPLING DATA** | **LITHOLOGY**



Depth, feet	Graphic Log	TOV Values (ppmv)	Blow Count/ Recovery (feet)	Visual Description
				(0-0.17') Duff and Topsoil - Silty Gravel, dark brown, dry
				(0.17-4.5') Silty Gravel, with cobbles, brown, dry, easy drilling, dusty
5				(4.5-20.5') Highly weathered, fractured siliceous Shale, dark purple, dry, fractures are heavily coated with silt, easy drilling (@~19' softer zone in siliceous shale, cuttings are finer, dustier)
10				
15				
20				(20.5'-) Weathered, fractured siliceous Shale, dark purple, dry, fractures are heavily coated with silt (Rock chips are ~1/2" average, not as dusty while drilling)
25				(@~24') Rock appears more competent, chips are larger (Average ~1/2") not as dusty, chips thrown ~25' from rig, feel hammer pounding on ground (@~26' color becomes brownish purple)
30				Bottom of Boring 32', No groundwater while drilling, or after drilling. Transducer installed 6" above bottom of well

5/5/11 Black Pearl Alpena
MIDC
mostly clear, windy ~35°

0915 MD, KH, & LD onsite (Heavier)
-Tanner site

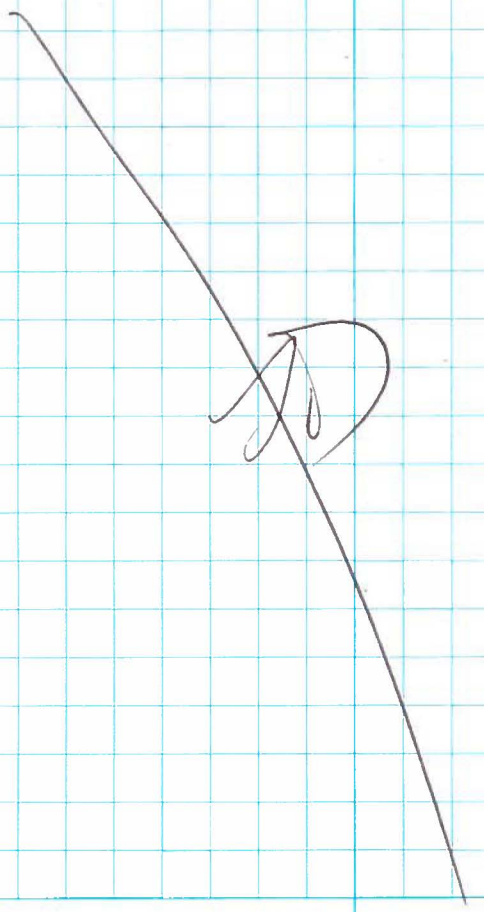
Primary Vault
2½" Sch 80 OD
30' complex to wall of vault
4' Depth in lower ring
currently 4.5' water
ID 48"

Upper Vault
ID 48"
Depth ~12'
~ 5' of water

1100 KH + MD offsite
LD began sampling
1230 KH + MD onsite
1245 KH + MD offsite
1300 Ron onsite
-below WL M, turn on pump
1330 Ron offsite

5/5/11
page 2

1340 Ron onsite
1700 Ron offsite
1900 LD offsite



Black Pine Mine · 5/19/11

MDEQ

Sunny ~30° →

0745 LD & JH arrive onsite

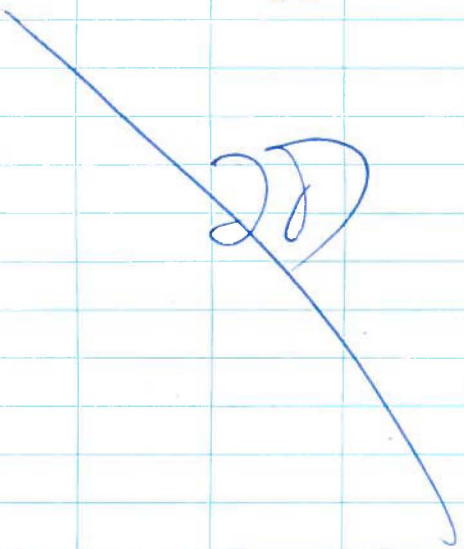
0805 KH arrive onsite
- located seeps

1130 KH offsite

1350 Dave C (Long & I (MDEQ) onsite

1420 DC & I offsite

1645 LD & JH offsite



BLACK PINE MINE SURFACE WATER SAMPLING
COMBINATION MINE AOC

Project Number: 776-012

Sampled by: LD

Location ROAD CUT Time 1620 Date 5/19/11

FIELD MEASUREMENTS/WATER CONDITIONS

Time	pH	Temp, °C	Dissolved Oxygen, mg/L	Specific Conductance, µΩ/cm	Flow, gal/min	Observations
1625	6.13	6.62	17.49	0.041	NM	

Comments:

BLACK PINE MINE SURFACE WATER SAMPLING
COMBINATION MINE AOC

Project Number: 776-012

Sampled by: LD

Location TSP-10 Time 1600 Date 5/19/11

FIELD MEASUREMENTS/WATER CONDITIONS

Time	pH	Temp, °C	Dissolved Oxygen, mg/L	Specific Conductance, µΩ/cm	Flow, gal/min	Observations
1601	5.95	8.17	14.40	0.041	~5	

Comments:

BLACK PINE MINE SURFACE WATER SAMPLING
COMBINATION MINE AOC

Project Number: 776-012

Sampled by: LD

Location CPS-7A Time 1515 Date 5/19/11

FIELD MEASUREMENTS/WATER CONDITIONS

Time	pH	Temp, °C	Dissolved Oxygen, mg/L	Specific Conductance, µΩ/cm	Flow, ~~gal/min~~	Observations
1516	5.65	14.04	10.42	0.200	~0.7 L/min	≅ 0.18 gpm

Comments:

BLACK PINE MINE SURFACE WATER SAMPLING
COMBINATION MINE AOC

Project Number: 776-012

Sampled by: LD

Location CPS-8 Time 1455 Date 5/19/14

FIELD MEASUREMENTS/WATER CONDITIONS

Time	pH	Temp, °C	Dissolved Oxygen, mg/L	Specific Conductance, µΩ/cm	Flow, gal/min	Observations
1455	6.40	14.00	10.64	0.049 m^3/cm	< 0.25 l/m ≅ 0.066 gpm	

Comments: Barely flowing water

BLACK PINE MINE SURFACE WATER SAMPLING
COMBINATION MINE AOC

Project Number: 776-012

Sampled by: LD

Location CPS-11 (No. Fork Area Spring) (North) Time 1350 Date 5/19/11

FIELD MEASUREMENTS/WATER CONDITIONS

Time	pH	Temp, °C	Dissolved Oxygen, mg/L	Specific Conductance, µΩ/cm	Flow, ~~gal/min~~	Observations
1352	5.32	7.79	14.30	0.145	12 L/min	≈ 3 spm

Comments:

BLACK PINE MINE SURFACE WATER SAMPLING
COMBINATION MINE AOC

Project Number: 776-012

Sampled by: LD

Location CPS-10B (CPS-10) Time 1340 Date 5/19/11

FIELD MEASUREMENTS/WATER CONDITIONS

Time	pH	Temp, °C	Dissolved Oxygen, mg/L	Specific Conductance, µΩ/cm	Flow, ~~gal/min~~	Observations
1342	4.51	8.51	14.70	0.528	2.0 L/min	0.5 gpm

Comments:

BLACK PINE MINE SURFACE WATER SAMPLING
COMBINATION MINE AOC

Project Number: 776-012

Sampled by: LD

Location North Runoff Time 1320 Date 5/19/11

FIELD MEASUREMENTS/WATER CONDITIONS

Time	pH	Temp, °C	Dissolved Oxygen, mg/L	Specific Conductance, µΩ/cm	Flow, gal/min	Observations
1322	6.18	12.09	10.42	0.171	~15	

Comments:

BLACK PINE MINE SURFACE WATER SAMPLING
COMBINATION MINE AOC

Project Number: 776-012

Sampled by: LD

Location CPS-1 Time 1310 Date 5/19/11

FIELD MEASUREMENTS/WATER CONDITIONS

Time	pH	Temp, °C	Dissolved Oxygen, mg/L	Specific Conductance, µΩ/cm	Flow, gal/min	Observations
112	4.15	8.24	16.68	0.573	~24	

Comments:

BLACK PINE MINE SURFACE WATER SAMPLING
COMBINATION MINE AOC

Project Number: 776-012

Sampled by: LD

Location CPS-2 Time 1249 Date 5/19/11

FIELD MEASUREMENTS/WATER CONDITIONS

Time	pH	Temp, °C	Dissolved Oxygen, mg/L	Specific Conductance, µΩ/cm	Flow, gal/min	Observations
1242	5.81	7.47	12.50	0.055	~60	

Comments:

BLACK PINE MINE SURFACE WATER SAMPLING
COMBINATION MINE AOC

Project Number: 776-012

Sampled by: LD

Location CPSW-1 Time 1220 Date 5/19/11

FIELD MEASUREMENTS/WATER CONDITIONS

Time	pH	Temp, °C	Dissolved Oxygen, mg/L	Specific Conductance, µΩ/cm	Flow, gal/min	Observations
1222	6.57	13.67	9.71	0.068	~70	

Comments:

BLACK PINE MINE SURFACE WATER SAMPLING
COMBINATION MINE AOC

Project Number: 776-012

Sampled by: LD

Location CPSW-2 Time 1155 Date 5/14/11

FIELD MEASUREMENTS/WATER CONDITIONS

Time	pH	Temp, °C	Dissolved Oxygen, mg/L	Specific Conductance, µΩ/cm	Flow, gal/min	Observations
1156	6.10	17.14	9.04	0.090	~105	

Comments:

BLACK PINE MINE SURFACE WATER SAMPLING
COMBINATION MINE AOC

Project Number: 776-012

Sampled by: LD

Location CPS-1A (Dump Toe Runoff Ditch) Time 1100 Date 5/19/11

FIELD MEASUREMENTS/WATER CONDITIONS

Time	pH	Temp, °C	Dissolved Oxygen, mg/L	Specific Conductance, µΩ/cm	Flow, gal/min	Observations
1104	3.42	8.54	11.05	0.415	~1.5	

Comments:

BLACK PINE MINE GROUNDWATER SAMPLING
COMBINATION MINE AOC

Project Number: 776-012

Sampled by: LD

Well No. CMMW-4 Time ~~1100~~ 1810 Date 5/5/11

Total Depth ~~74.2~~ 73.0 ft Well Diameter 2 in

Depth to Hydrocarbon _____ ft Gallons/ft 0.163 gal

Depth to Water 37.11 ft Gallons/ Casing Volume 5.9 gal

Water Column ~~36~~ 35.11 ft 35.89 36 Total Purge Volume 17.7 ~~gal~~ gal

FIELD MEASUREMENTS/WATER CONDITIONS

Time	Volume Removed	pH	Temp, °C	Dissolved Oxygen, mg/L	Specific Conductance, µΩ/cm	Observations
1824	5	5.8	6.7	10.2	13 ms/m	yellowish brown
1830	9	5.9	5.9	11.5	13	
1836	13	5.4	5.9	11.6	13	

Comments: 1850 collected 3 liters

BLACK PINE MINE GROUNDWATER SAMPLING
COMBINATION MINE AOC

Project Number: 776-012

Sampled by: LD

Well No. CMMW-5

Time 1740 Date 5/5/11

Total Depth 63.8 ft

Well Diameter 2 in

Depth to Hydrocarbon _____ ft

Gallons/ft 0.163 gal

Depth to Water 52.11 ft

Gallons/ Casing Volume 0.9 gal

Water Column 5.69 ft

Total Purge Volume 2.7 gal

FIELD MEASUREMENTS/WATER CONDITIONS

Time	Volume Removed	pH	Temp, °C	Dissolved Oxygen, mg/L	Specific Conductance, µΩ/cm	Observations
1749	0.5	5.7	6.7	8.6	31 mS/m	
1753	1.5	5.3	6.7	8.0	27	
1757	2.5	5.2	6.6	8.6	23	

Comments: 1800 Collected 30' Layton

BLACK PINE MINE GROUNDWATER SAMPLING
COMBINATION MINE AOC

Project Number: 776-012

Sampled by: LD

Well No. Cmmw-2

Time 1710 Date 5/5/11

Total Depth 55.15 ft

Well Diameter 2 in

Depth to Hydrocarbon _____ ft

Gallons/ft 0.163 gal

Depth to Water 42.09 ft

Gallons/ Casing Volume _____ gal

Water Column _____ ft

Total Purge Volume _____ gal

FIELD MEASUREMENTS/WATER CONDITIONS

Time	Volume Removed	pH	Temp, °C	Dissolved Oxygen, mg/L	Specific Conductance, µΩ/cm	Observations
1723		5.8	5.7	8.5	0.205/m	yellow tint

Comments: 1730 Collected 3 Plastic

BLACK PINE MINE GROUNDWATER SAMPLING
COMBINATION MINE AOC

Project Number: 776-012

Sampled by: LD

Well No. CMMW-1

Time 1130 Date 5/5/11

Total Depth 102 ft

Well Diameter 2 in

Depth to Hydrocarbon _____ ft

Gallons/ft 0.163 gal

Depth to Water ~52 ft

Gallons/ Casing Volume 7.8 gal

Water Column 48 ft

Total Purge Volume 23.5 gal

FIELD MEASUREMENTS/WATER CONDITIONS

Time	Volume Removed	pH	Temp, °C	Dissolved Oxygen, mg/L	Specific Conductance, µΩ/cm	Observations
		5.7	6.3	7.4	13 mS/m	pink, sediment
		5.7	5.1	8.6	12	

Comments: 1700 Collected 6 Pinks
Field Dup

BLACK PINE MINE GROUNDWATER SAMPLING
COMBINATION MINE AOC

Project Number: 776-012

Sampled by: LD

Well No. CMMW-4 Time 1550 Date _____

Total Depth _____ ft Well Diameter 2 in

Depth to Hydrocarbon _____ ft Gallons/ft 0.163 gal

Depth to Water 0.00 ft Gallons/ Casing Volume _____ gal

Water Column _____ ft Total Purge Volume _____ gal

FIELD MEASUREMENTS/WATER CONDITIONS

Time	Volume Removed	pH	Temp, °C	Dissolved Oxygen, mg/L	Specific Conductance, µΩ/cm	Observations
1557		5.0	6.8	12.0	48 mS/m	
1559		4.9	4.5	12.8	44	
1602		4.9	5.3	11.8	43	

Comments: Sc/C pursing

1610 collected 3 Plastic

BLACK PINE MINE GROUNDWATER SAMPLING
COMBINATION MINE AOC

Project Number: 776-012

Sampled by: LD

Well No. CMMW-7

Time 1300 Date 5/5/11

Total Depth 53.41 ft

Well Diameter 2 in

Depth to Hydrocarbon _____ ft

Gallons/ft 0.163 gal

Depth to Water 50.72 ft

Gallons/ Casing Volume 0.44 gal

Water Column 2.69 ft

Total Purge Volume 1.32 gal

FIELD MEASUREMENTS/WATER CONDITIONS

Time	Volume Removed	pH	Temp, °C	Dissolved Oxygen, mg/L	Specific Conductance, µΩ/cm	Observations
1312	0.33	4.7	8.5	11.8	0.11 S/m	cloudy, light brown-y-g
1316	0.5	4.4	7.4	11.5	0.10	

Comments: well dry @ ~ 0.5 gal

14±0 Collected 37 readings

BLACK PINE MINE GROUNDWATER SAMPLING
COMBINATION MINE AOC

Project Number: 776-012

Sampled by: LD

Well No. CMMW-8

Time 1330 Date 5/5/11

Total Depth 76.9 ft

Well Diameter 2 in

Depth to Hydrocarbon _____ ft

Gallons/ft 0.163 gal

Depth to Water 43.73 ft

Gallons/ Casing Volume 5.4 gal

Water Column 33.17 ft

Total Purge Volume 16.2 gal

FIELD MEASUREMENTS/WATER CONDITIONS

Time	Volume Removed	pH	Temp, °C	Dissolved Oxygen, mg/L	Specific Conductance, µΩ/cm	Observations
1348	4.5	5.3	8.0	11.6	0.15 S/m	Cloudy
1352	9	5.2	7.5	11.0	0.14	
1402	12	5.24	7.0	10.9	0.13	

Comments: 1410 Collected 3 Bottles

BLACK PINE MINE GROUNDWATER SAMPLING
COMBINATION MINE AOC

Project Number: 776-012

Sampled by: LD

Well No. CMMW-9

Time 1335 Date 5/5/11

Total Depth 32.78 ft

Well Diameter 2 in

Depth to Hydrocarbon _____ ft

Gallons/ft 0.163 gal

Depth to Water 30.35 ft

Gallons/ Casing Volume 0.4 gal

Water Column 2.43 ft

Total Purge Volume 1.2 gal

FIELD MEASUREMENTS/WATER CONDITIONS

Time	Volume Removed	pH	Temp, °C	Dissolved Oxygen, mg/L	Specific Conductance, µΩ/cm	Observations
1420	0.3	5.5	7.9	11.3	77 ms/m	Clear
1424	0.7	5.5	6.5	12.3	81	
1427	1.0	5.4	7.0	12.1	79	cloudy

Comments: ~~1435~~ collected 3 Plastics, 1630
Drug 1 gal

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BLACK PINE MINE GROUNDWATER SAMPLING
COMBINATION MINE AOC

Project Number: 776-012

Sampled by: LD

Well No. CMMW-3

Time 1502 Date 7/5/11

Total Depth 58.00 ft

Well Diameter 2 in

Depth to Hydrocarbon _____ ft

Gallons/ft 0.163 gal

Depth to Water 27.77 ft

Gallons/ Casing Volume 4.9 gal

Water Column 30.23 ft

Total Purge Volume 14.7 gal

FIELD MEASUREMENTS/WATER CONDITIONS

Time	Volume Removed	pH	Temp, °C	Dissolved Oxygen, mg/L	Specific Conductance, µΩ/cm	Observations
1513	4	5.3	6.5	12.4	67 mS/m	
1521	8	5.2	6.9	11.9	69	
1529	12	5.1	7.2	11.8	69	

Comments: _____

Trihydro CORPORATION

Lithology Log

Sheet 1 of 1

LOCATION ID: REPOSITORY # 2

Project Name	Project Number	Site ID
BLACK PINE MINE	776-012-002	BP-RY-SS-04

Excavation Company	Operator	Ground Elevation	Total Depth
MUNGAS CO	KARL KONRAD		10.5 feet-bgs

Equipment	Weather	Temperature	Date/Time Started	Date/Time Total Depth Reached
322 B	SUNNY	60°f	1110	1140

Sampler	Water Level (bgs)	Hydrogeologist	Checked by/Date
MONGOVEN	First 33" ~~feet~~bgs		

Location Description (include sketch in field logbook)

Depth	Interval	Recovery	Blow Counts	Description (Include lithology, grain size, sorting, angularity, Munsell color name & notation, minerology, bedding, plasticity, density, consistency, etc., as applicable)	ASTM Code	Lithology	Water Content	Estimate % of Gr	Sa	Fi	Remarks (Include all sample types & depth, odor, organic vapor measurements, etc.)
0				DUFF TOPSOIL - SANDY SILTY GRAVEL w/ ORGANICS, DK BROWN (DRY)							
				-10"							
1				COLLUVIUM - SILTY SAND w/ COBBLES & GVL TR ORGANICS, WEATHERED BEDROCK (DAMP) DARK BROWN							BP-RY-SS-04-00 0"-18"
2											
3				-33" - (WET) SEAM							
				-36"							
4				HIGHLY WEATHERED BED ROCK - COBBLES w/ SAND & GRAVELS TR SILT, REDISH BROWN COBBLES, SHALES, YELLOWISH BROWN w/ PURPLE FINES, FE STAINING, ~~GRADES~~ 4% MICACEOUS (DAMP) SILT IS							Some Rocks are able to be broken with hands only BP-RY-SS-04-01 8'
5											
6											
7											
8											HARD DIGGING BACK FILLED
9											
10											

10.5' STOPPED DIGGING

Trihydro CORPORATION

Lithology Log

Sheet 1 of 2

LOCATION ID: REPOSITORY # 2

Project Name	Project Number	Site ID
BLACK PINE MINE	776-012-002	BP-RY-SS-03-

Excavation Company	Operator	Ground Elevation	Total Depth
MUNGAS Co	KARL KONRAD		13' feet-bgs

Equipment	Weather	Temperature	Date/Time Started	Date/Time Total Depth Reached
322 B	SUNNY	60°f	10:00	10:40

Sampler	Water Level (bgs)
MONGOVEN	First ___ feet-bgs
	Hydrogeologist: Checked by/Date:

Location Description (include sketch in field logbook)

Depth	Interval	Recovery	Blow Counts	Description (Include lithology, grain size, sorting, angularity, Munsell color name & notation, minerology, bedding, plasticity, density, consistency, etc., as applicable)	ASTM Code	Lithology	Water Content	Estimate % of Gr	Sa	Fi	Remarks (Include all sample types & depth, odor, organic vapor measurements, etc.)
0				HIGHLY WEATHERED SHALE TOPSOIL - SILTY GRAVELS, TR SAND & ROOTS							
1				SILT ~~COBBLES~~ SLIGHTLY MICACEOUS (DAMP)							BP-RY-SS-03-00 0'-18"
2				24" Colluvium - COBBLES - GRAVEL w/ SILTY SANDS TR MN COATING & FE STAINING, DK BROWN COBBLES w/ BROWN SILTY SANDS (DAMP)							BP-RY-SS-03-01 13'
3											
4											
5											
6											
7											
8											
9											
10											

Trihydro CORPORATION

REPOSITORY #2

Lithology Log (continued) Sheet 2 of 2

LOCATION ID: BP-RY-SS-03-01

Depth	Interval	Recovery	Blow Counts	Description (Include lithology, grain size, sorting, angularity, Munsell color name & notation, minerology, bedding, plasticity, density, consistency, etc., as applicable)	ASTM Code	Lithology	Water Content	Estimate % of Gr	Sa	Fi	Remarks (Include all sample types & depth, odor, organic vapor measurements, etc.)
10											
11											HARD DIGGING
12											
13				MANGANESE BLACK STREAKING (DAMP) ON COBBLES REDISH DK BROWN - PURPLE COBBLES GRAVEL w/ SILT						13'	BP-RY-SS-03-01 SAMPLE 13'
14											HIT REFUSAL BACKFILLED
15											
16											
17											
18											
19											
20											
21											
22											
23											

Trihydro CORPORATION

Lithology Log

Sheet 1 of 1

LOCATION ID: REPOSITORY # 1

Project Name	Project Number	Site ID
BLACK PINE MINE	776-012-002	BP-RY-55-02

Excavation Company	Operator	Ground Elevation	Total Depth
MUNGAS Co	KARL KONRAD		~~feet-bgs~~ 32"

Equipment	Weather	Temperature	Date/Time Started	Date/Time Total Depth Reached
322 B	SUNNY	58° f	8:30	8:40

Sampler	Water Level (bgs)	
MONGOVEN	First ___ feet-bgs	
	Hydrogeologist	Checked by/Date

Location Description (include sketch in field logbook)

Depth	Interval	Recovery	Blow Counts	Description (Include lithology, grain size, sorting, angularity, Munsell color name & notation, minerology, bedding, plasticity, density, consistency, etc., as applicable)	ASTM Code	Lithology	Water Content	Estimate % of Gr	Sa	Fi	Remarks (Include all sample types & depth, odor, organic vapor measurements, etc.)
0				HIGHLY FRACTURED BEDROCK W/TOP SOIL, TR ORGANICS, DK BROWN							BP-RY-02-00
1				6" SILT (DRY) SILT FILLS FRACTURES IN SHALE BEDROCK							0"-6"
2				FRACTURED WEATHERED BEDROCK - DK BROWN SILT FILLS FRACTURES. SHALE BEDROCK (DRY) - PURPLE TO REDISH BROWN BEDROCK							BP-RY-02-01
3				32" - BEDROCK							6" - 32" HIT REFUSAL
4											BOTTOM OF EXCAVATION
5											BACK FILLED
6											
7											
8											
9											
10											

Trihydro CORPORATION

Lithology Log

Sheet 1 of 1

LOCATION ID: REPOSITORY # 1

Project Name	Project Number	Site ID
BLACK PINE MINE	776-012-002	BP-RY-SS-01

Excavation Company	Operator	Ground Elevation	Total Depth
MUNGAS CO	KARL KONRAD		__ feet-bgs 52"

Equipment	Weather	Temperature	Date/Time Started	Date/Time Total Depth Reached
322 B	SUNNY	56°f	9:12	9:18

Sampler	Water Level (bgs)	
MONGOVEN	First __ feet-bgs	
	Hydrogeologist	Checked by/Date

Location Description (include sketch in field logbook)

Depth	Interval	Recovery	Blow Counts	Description (Include lithology, grain size, sorting, angularity, Munsell color name & notation, minerology, bedding, plasticity, density, consistency, etc., as applicable)	ASTM Code	Lithology	Water Content	Estimate % of Gr	Sa	Fi	Remarks (Include all sample types & depth, odor, organic vapor measurements, etc.)
0				HIGHLY WEATHERED BED Rock - SILTY SANDY GRAVELS, TR ROOTS, TR 6" MN STAINING, GRAVEL IS SILICEOUS SHALE, DK BROWN, W/ REDISH BROWN GRAVELS (DRY)							BP-RY-SS-01-00 0-16"
1											
2				16" ~~HIGHLY~~ WEATHERED BED Rock - GRAVELLY COBBLES - TRACE SAND & SLT, COBBLE ARE SHALE, DK BROWN-PURPLE (SLIGHTLY MOIST)							BP-RY-SS-01-02 16"-32"
3											
4				-50" REDISH PURPLE BED Rock SHALE							HIT REFUSAL
				52" SHALE BED Rock							BOTTOM OF EXC. BACK FILLED
5											
6											
7											
8											
9											
10											

Trihydro CORPORATION

Lithology Log Sheet 1 of 1

LOCATION ID: REPOSITORY # 3

Project Name	Project Number	Site ID
BLACK PINE MINE	776-012-002	BP-RY-SS-05

Excavation Company	Operator	Ground Elevation	Total Depth
MUNGAS CO	KARL KONRAD		5' feet-bgs

Equipment	Weather	Temperature	Date/Time Started	Date/Time Total Depth Reached
322 B	SUNNY	65°f	12:05	12:16

Sampler	Water Level (bgs)	
MONGOVEN	First __ feet-bgs	
	Hydrogeologist	Checked by/Date

Location Description (include sketch in field logbook)

Depth	Interval	Recovery	Blow Counts	Description (Include lithology, grain size, sorting, angularity, Munsell color name & notation, minerology, bedding, plasticity, density, consistency, etc., as applicable)	ASTM Code	Lithology	Water Content	Estimate % of Gr	Sa	Fi	Remarks (Include all sample types & depth, odor, organic vapor measurements, etc.)
0				TOPSOIL - SANDY SILTS W/ ORGANICS (DRY) DK BROWN							
				-6"							
1				WEATHERED BED ROCK - SANDY SILTS W/ COBBLES, TR ORGANICS, SHALE GRAVELS DK BROWN SILTS, PURPLE SHALES W/ MN COATING (DRY)							BP-RY-SS-05-00 6"-18"
2				-24"							
3				WEATHERED BEDROCK - COBBLES W/ SANDY SILT; HIGHLY FRACTURED FRACTURED BED ROCK REDISH BROWN, PURPLE SHALE, FRACTURES ARE SILT LINED. (SLIGHTLY MOIST)							
4											BP-RY-SS-05-01 5'
5				-5' BEDROCK - HIT REFUSAL —							- BOTTOM OF EXCAVATION BACK FILLED
6											
7											
8											
9											
10											

Black Pond Mine · 5/19/11

MDEQ

Sunny ~30° →

0745 LD & JH arrive on site

0805 KH arrive onsite

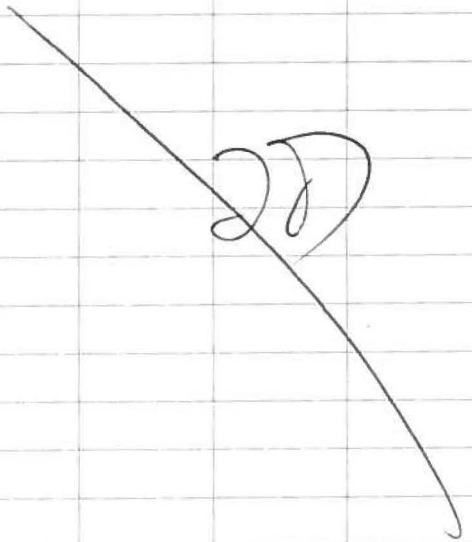
- located seeps

1130 KH offsite

1350 Dawn Clang + 1 (MDEQ) onsite

1420 DC + 1 offsite

1645 LD & JH offsite



Black Pond Mine / MDEQ

Mostly Cloudy ~ 75°

0900 LD arrive onsite

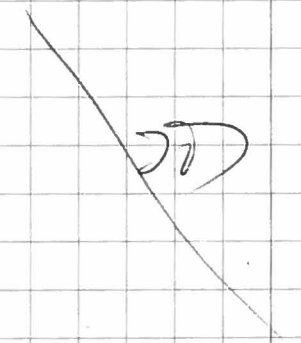
0915 Herman (4) onsite

{ 826947.37 N
992249.42 E

{ 8271498 ft N
992784.09 ft E

SPCS '83 · Mont 23 zo

1635 LD + Herman (3) offsite



Block Time Mon 6/14/11

Partly Cloudy ~45° → 70

0400 LD + Herron (3) arrive onsite
Check out fall's
- no flow

1000 USFS (Bob + Sonny) arrive onsite

1200 USFS (2) offsite

1300 Begin walking events for synoptic,
collect sediment & discharge
- 2 groups (LD & JJ) (GC & AS)

1900 offsite

Boom 6/15/11

Cloudy ~45°

0730 LD, Herron (3) arrive onsite

0845 Discharge SW-16

0915 Discharge sediment SW-02
- Scoop between SW-02 & SW-16
sludge bowl

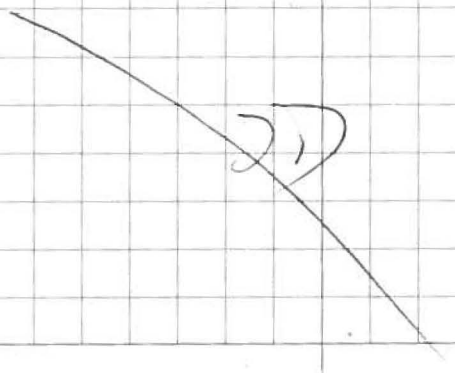
1000 LH onsite

1145 Calibrated YSI
pH was 6.60 + 0.35

1235 Began synoptic sampling
event at CML-SW-05

1542 Complete synoptic event at
CML-SW-01

1700 LD + Herron (4) offsite



Black Pine Mine
Sampling Data

6/13/11

	Time	pH	Temp	DO	SC
MCSP-1	1435	8.33	11.17°C	8.71 mg/L	0.055 mS/cm
sampled 1440					
SML-SW-06	1625	8.31	19.46	6.03	0.164
sampled 1630					

6/14/11

SML-SW-07	1005	7.70	6.95	7.96	0.54
CML-SW-06	1430	~~3.64~~ 7.20	3.64	9.35	0.07
- Insignificant flow, larger flow on East side					
CML-SW-07	1740	6.72	5.29	9.20	0.022
	1745				

Black Pine Mine 7/11/11

Mostly Sunny ~75°

1300 Phone call w/ KH
- location onsite Wed 7/13; began sampling/exp at respective sites, Harper/Hanson

1330 LD & JH onsite
Stukey test pit locations

1630 KH, AS, GC (Hansen) onsite
reviewed plan, logbooks, safety

1745 Hansen (3) offsite

1820 LD & JH offsite

Black Pond Mine
Sampling Data

6/13/11

	Time	pH	Temp	DO	SC
MCSP-1	1435	8.33	11.17°C	8.71 mg/L	0.055 mS/cm
sampled 1440					
SML-SW-04	1625	8.31	19.40	6.03	0.164
sampled 1630					

6/14/11

SML-SW-07	1005	7.56	6.95	7.96	0.54
CML-SW-06	1430	~~7.64~~ 7.26	3.64	9.35	0.07
- Insignificant flow, larger trib on East side					
CML-SW-07	1740	6.72	5.29	9.20	0.072
	1745				

Black Pond Mine

Mostly Sunny ~75°

1300 Phone call w/ KH
- location onsite Wed 7/13; begin sluicing/exc at approx 8am. Harper/Hanson

1330 LD to JH onsite
Stukey test pit locations

1630 KH, AS, GC (Hansen) onsite
reviewed plan, logbooks, safety

1745 Hansen (3) off site

1820 LD to JH off site

Black Dam mm MDOQ 7/12/14

Sunny ~55°

0630 Regan Jerome 431

0705 LD onsite

Mungas onsite w/ excavator (Cat 322B)

DC onsite

Herrera (3) already onsite

JMt JH (TH) already onsite

0915 CML-SD-45 (LD, AS, JH)

Mottled dark brown and sandy (light brown) spots, Grass/vegetation growing

Auger & shovel

- Mercury Passive Sampler — 0900

- Analyzer 0.000

0930 CML-SD-43

- Analyzer 0.000

Dark brown, heavy vegetation, dry some sand

0940 CML-SD-40

- 0.000

Dark Brown, heavy veg, wet, organic matter, silty/clay, fine material

0945 CML-SD-37

- 0.000

- light brown, dry, ¼ - 1½ aggregate

cont

0955 CML-SD-34

-0.000

Sandy, small gravel, trace silt, heavy veg, dark brown, rust colored flakes, ~~trees~~ 23'

1010 CML-SD-34

-0.000

Dark brown, wet, heavy veg, wetland/seep area, fine texture

1015 CML-SD-35

0.000 (roots)

Dark brown, heavy organic matter, some cobbles, silty sand

1025 CML-SD-32

0.000

~~Medium~~ light brown, heavy veg, sandy silt, some cobble

1035 CML-SD-41

0.000

Heavy veg, light brown, dry, rocky, silt w/ trace clay & sand

1040 CML-SD-44

0.000

Dark brown, fine texture, Heavy veg, organic matter

cont.

7/12/14
page 3

1045 CMC-SD-46
0.000
- Very wet, dark brown, heavy veg, characteristic wetland soil odor, fine texture silt & clay, heavy organics

1145 CMC-SD-33-00
0.000
Dark to light grey, sparsely vegetated, silty, sandy; potential tailings
1155 CMC-SD-33-01
0.000
light brown, sandy, moist, some organics collected ~ 6 inches below interface
- refusal @ ~ 1 foot
1210 CMC-SD-32-00
0.000
Patches / Mottled brown sand / dark brown fine material (silty w/ some sand)
1220 CMC-SD-31-00
0.000
Sandy silt; brown to white/light brown discolored by no vegetation

cont

7/12/14
page 4

1235 CMC-SD-31-02
0.011
Brown, coarse sand w/ cobble, wet
~ 2.5 ft below ground surface
1250 CMC-SD-29-00
0.000
light brown, moderate veg, sandy
1255 CMC-SD-28-00 Redisol at Native (heavy cobble
0.000
- fine grained, silt, sand, some organic matter, light veg
- side slope of tailings
1315 Some mongoven offsite
1420 CMC-SD-27-00
0.006
- Sandy, cobbles, not much soil - light brown sand
1430 CMC-SD-24-00
0.000
- Woody debris, silt w/ sand, light brown/grey
1435 CMC-SD-24-01
0.000 - ~ 1.5 bgs
Dark Brown, wet, silty w/ brown clay, large 4-6 inch cobbles

cont

7/12/11
page 5

1445 CML-SD-25-00.
0.000
Sandy silt, light brown, light veg - under older trees, large diameter rocks

1450 CML-SD-26-00
0.000
Dark brown, sand, gravel, cobble, pine needles

1500 CML-SD-21-00
0.000
Brown to Dark brown, sand some silt
Moderate veg, high moisture, organic matter

1505 CML-SD-20-00
0.000
brown to light brown, sandy, light veg

1515 CML-SD-30-02
0.000 ~2.5 ft bgs
Dark brown, silt, saturated, interface
~ 3inches bgs

1550 lightning stop work

1615 KH called work stop for the day

1630 DC (MDEQ), Carl (Mangas), 3 Herrera, 2THC off Park

Blackbear more MDEQ 7/13/11
Partly Cloudy 55→75

0630 Regroup with Team 431-X
07-W Herrera (2)(GC 645) & LD & JH (THC) arrive onsite, Carl (Mangas) onsite
0745 Safety meeting
0750 KH onsite
0815 CML-SD-42-00
0.000
light brown, fine, rocky, moderate veg
sandy, some organic matter
- appears to be beaver material
- dark brown layer at ~1 ft bgs
0845 CML-SD-42-02
0.000 ~2 ft bgs
Dark Brown, fine texture, cobbles
Sandy top layer to ~1.5 ft bgs
0900 CML-SD-39-00
0.000
Dark brown, Dry, silt & sand, Heavy veg
organic matter - lots of roots
0920 CML-SD-30-00
0.000
Dark Brown, larger cobbles, silt w/ sandy
light veg, wet

cont.

7/13/11
page 2

JD

0933 Ambient air measurement at Northernd of impoundment 0.005 - 0.008

0935 CML-SD-22-00
0.000 - North toe of N pond berm
Brown, rocky, heavy organic matter, sandy
large piece of wood buried

0945 CML-SD-23-00
-0.000
- ~3 inches of Dark Brown top soil, then light brown sandy, gravel, cobbles, heavy veg

0950 CML-SD-23-02
0.000
- light brown, clay/sand, cobbles
- collected ~ 1.5 lgt bgs

1010 CML-SD-19-00
0.000 ~ 1 ft thick
- ~ 2 inches of pine needles on surface, light brown to tan, very fine texture, sandy

1015 CML-SD-19-02
0.000 collected ~ 2 ft bgs
dark brown, clay, some sand

cont

7/13/11
page 3

1025 CML-SD-18-00
0.000
Dark brown to black, ~2 inches of pine needles on top, silty, cohesive

1100 Walked Old Mill area w/ LH. Showed biologist deposits downstream

1200 Selected Test Pit locations at Mill area

1245 Work stopped for lightning

1300 Travel to Construction Mine Site to collect USTs samples

1345 CMN-SS-15
Brown, sandy

1355 CMN-SS-14
Brown, sandy

1415 Return to Harrison simply, transfer coolers/ice

1425 HM-SS-10
Brown to light brown, no veg, ½ - 1½" aggregate

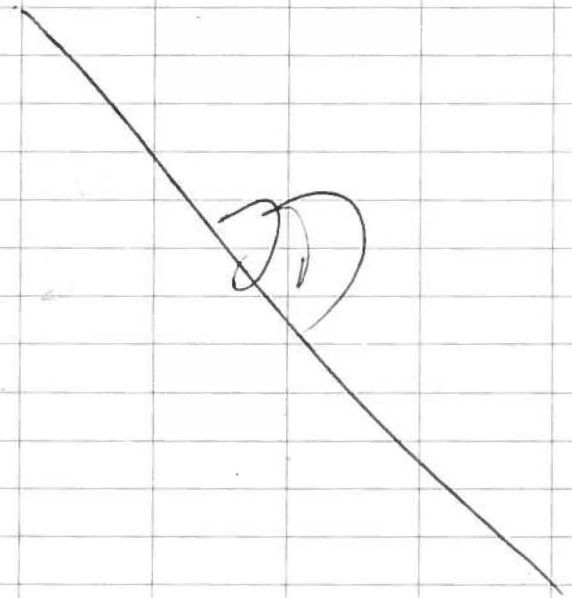
1440 HM-SS-09
Brown to light brown, no veg, ½ - 1½ aggregate gravel

1500 HM-SS-12
Brown to light brown, no veg, aggregate less gravel

cont.

7/13/11
page 4

1510 HM-55-11
Dark brown, roots, gravel
1540 HM-55-15
Dark brown, lots of roots, moderate vegetation
1550 HM-55-16
Dark Brown, heavy organic matter large gravel,
1630 Checked in and started with Katy. Locate at combination mine area
1700 LD & JH offsite



Cloudy, Rain 55° →
0630 Regenerate Tirone
0730 2 (Herman) + 2 (THC) arrive onsite
0750 Safety Meeting
GC, HS (Herman), LD & JH (THC)
0815 HM-55-14
Brown, gravel, wood
0845 HM-55-13
Brown, gravel, wood
0930 Phone call w/ DC
- unlock gate for propane delivery
- Propane onsite
0945 Propane offsite
0957 CMN-55-05
- 3 pits
- cap @ 3' 6 ft track
- 4 ft new south edge
- 3 pits
1034 HM-55-16
Orange, gravel/sand, trace brass, rocks
- HM-55-15 & HM-55-14 on 7/13/11 were sampled from original position
- new sample locations were selected in the field

Cont

7/14/11
page 2

1110 CMW-SS-06

7 ft total depth
Black organic layer at ~2 ft bgs
Waste rock ~2 - 0.6
Cap 0.6 - 0.0

1215 CMW-SS04 DC onsite
~1.5 ft of cover ~2 → 5 ft WR

1320 CMW-SS-07
- Brown, cobbles 0 - 5 ft
fines
- orangish, sandy 5 - 9 ft
salts, soft rocks

1400 CMW-SS-08
Brown, sandy, gravel
Total 5.5 ft bgs
Transition to orange layer 3.5 ft bgs
Water seeping in at ~3 ft bgs

1430 CMW-SS-09
~6 inches topsoil
transition to gravel, sand, light brown

1445 Moving onto FS property

1450 CMW-SS-10
~6 inches black topsoil, fines

cont

0.5 - 4 orange/brown, sandy

1510 CMW-SS-14
~2 ft topsoil, heavy roots, rocks
2 - 5 orange/brown, sandy
water seeping at interface

1545 CMW-SS-13
0 - 1 black topsoil, fines, sandy
1 - 5 light brown, sandy, some fines

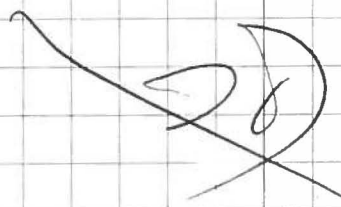
1600 CMW-SS-12

1630 CMW-SS-11
0 - 0.5 light brown, fines
0.5 - 5 brown, sandy, rocks

1700 DC offsite
Mungas moving to Mill area

1715 Herrera (2) offsite

1900 LD, JH (IHC) offsite
Carl (Mungas) offsite



22 Black Box Rum 7/15/11

Sunny 45° → 75°

0630 Regenerate Jerome

0645 LD & JH onsite

Hermon (2) onsite, Canal (Mangum) onsite

0650 Safety meeting

- JH to catalog infrastructure

0710 CML-TS-11

Total depth 13.5 ft bgs 14.5 ft bgs

Top layer

1.5 ft E to 3 ft W

Water seeping in at ~5 ft bgs, upslope end

lower layer 1.5 → 14.5

clay, cobbles, dark brown/orange

some silt, gravelly

0800 KH onsite

0830 ~~CML~~ CML-TS-10

0.004, 0.000, 0.000, 0.000

TD 6 ft

Tailings 0-2 ft bgs

water 33 inches

Native 2-6

gravelly, brown, large rocks

7/15/11 23

page 2

0930 CML-TS-01

0.000

TD ~6 ft

Tailings 3.5 → 1.5

Topsoil 0-1.5

- Brown, cobbles

1000 CML-TS-02

0.005

- Total Depth 6 ft cobbles, gravel

- Tailings 4-2.5 blocks

- brown layer ~2.5-1

- topsoil 1-0

- sand layer interwoven

1030 CML-TS-03

0.000

Total Depth 6 ft

Black clay layer 6-4?

Orange, potential tailings layer 2-1

water entering above black clay layer

1100 CML-TS-04

0.006, 0.004

Total Depth 5.5

Orange 2 → 1

- rocky, sandy, gravel

Cont

7/11/11
page 3

lower layer,
- dark brown to grey, silty sand

top layer
- brown, gravelly, silty sand

1130 CML-TS-05
0.000
Total Depth 4.5
Tailings 7 → 1.1
Black clay ~1.1 - 0.8
Brown cover 0.8 - 0

lower layer
- rounded cobbles. Dark grey

tailings
- orange, gravelly.

top layer
- brown, gravelly, silty sand

1210 CML-TS-06
0.004
Total Depth to 6.5 ft
Tailings layer 2.5 - 0.5 ft bgs
Top 0.5 - 00
6.5 - 2.5 black, cobbles, silty
2.5 - 0.5 orange/brown

7/11/11
page 4

1230 CML-TS-07
0.000
Total Depth 2.5
tailings layer ~~2.7~~ - 2.5 → 1.3
Top layer 1.3 → 0.0
Bottom layer
brown to light brown, gravel, large
rocks,
Tailings
sandy, light brown

1300 CML-TS-08
Total Depth 7 ft bgs
Grey to black 7 - 4.5 clay
Orangish 4.5 - 3 sandy silt
waste rock 3 - 0
- light brown, sandy, broken rock
Trace cover soil

1330 CML-TS-09
0.000
large rocks, bricks
mottled yellow/orange, red, green
Total 7.5 ft bgs
Yellow/orange large 5 - 2.5

cont.

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pages

1445 Herrera (3), Carl (Morgas) off site
1500 ~~1720~~ LD + JH catalog infrastructure
1720 LD + JH off site

LD

Black Dome Mine
Overcast 70°

1325 LD arrive onsite
Photos 001 - 005
Vault near portal
006 - 009
lower vaults
010 - 015
electrical at top
Photos 016 - 017
Possible path to auxiliary adit
018 - 027
utility path
028 -
Manhole on toe of dump
lid 25" dia
Vault 81" dia OD
~ 78 ID
Depth 11' from top
9' from bottom of opening
Water 32" " "
Pipe from South 6"
North 6" w/ flange
French Drain on East of Road
8" at road
Lewis Shaft
0016 - 55
1535 LD off site

8/18/11

0730 - BH leaves for site.

0753 - BH arrives @ Combustion Plant site.

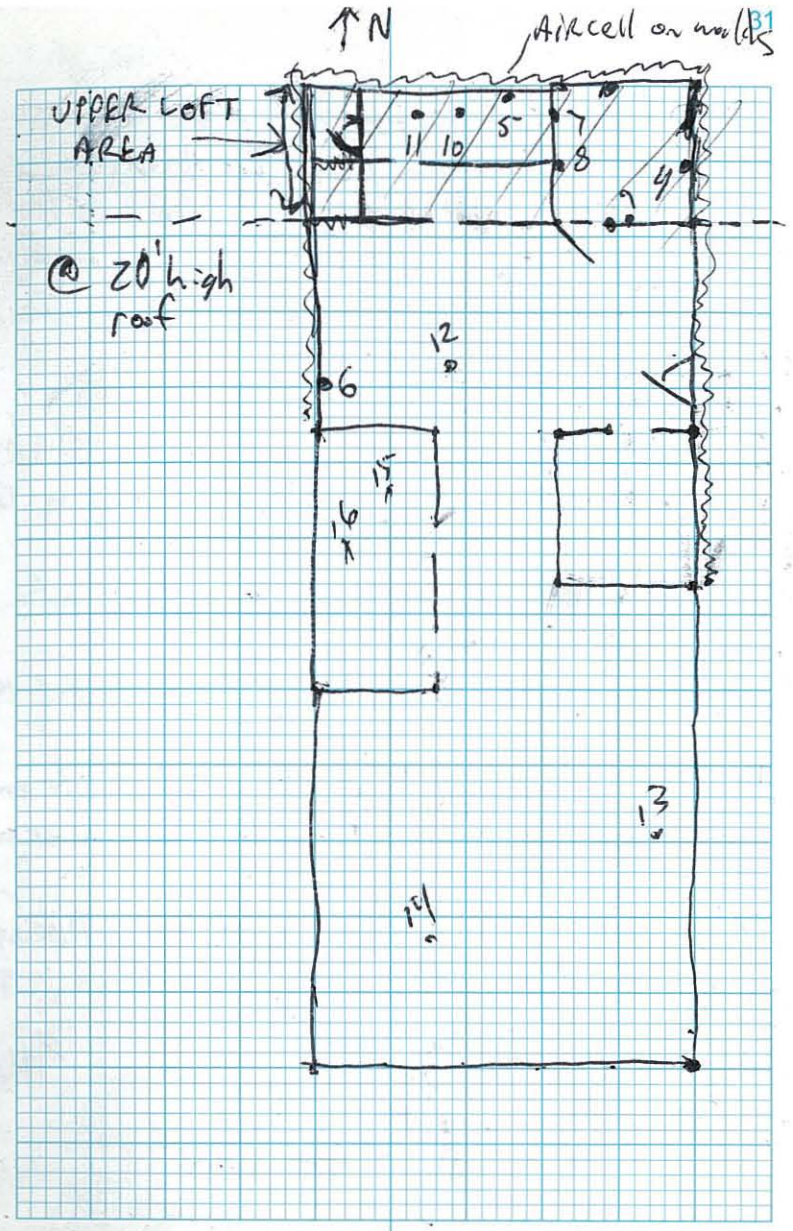
- Begins surveying from N to S for HBMS.

- Material list for N Bldg (1 sq = 2 ft) 0900
- Aircell insulation (4, 5, 6) 0900
- Drywall 7 8 9 0910
- Pipe sealant 10, 11 0920
- poured conc. floors 12, 13, 14 0930
- ceiling tiles 15, 16 0940

(8) 4ft lamp = 1/2 sq.
2 bulb 4 ft lamp = 1 sq.
4 bulb large = 1 sq.

* Fluorescent lights
* large Halides

- Metal beam structure set on conc. pad. Metal sheet siding air cell insulation on roof & north end walls. Forced electric heater NE corner left & SW corner. Drywall nailed to studs in NE office. Wood, metal fencing & corr. metal make up other walls. Aluminum windows w rubber factory sealants & Silicone



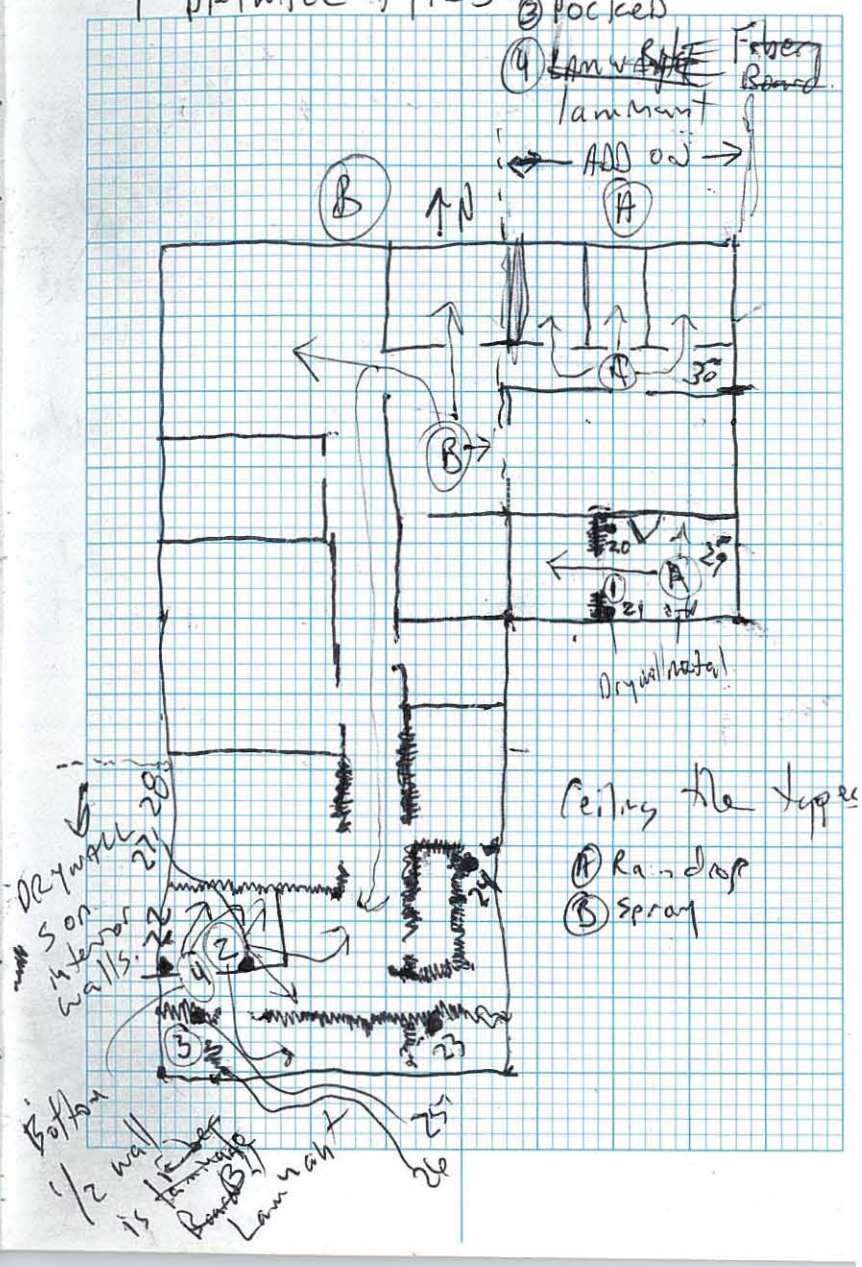
8/18/11 Black Pine Mine

1000 - Proceed to ~~process~~ 04 large storage structure. (150'x70'x25' tall).
large soil pile (40'x30'x4' tall) in center. collect 2 soil samples
BP-CMN-SS-17 1000
BP-CMN-SS-18 1010
for total recov. metals
- Metal structure w/ metal sheeting stycofoam & fireproofing on inside. dirt floor
Collect asbestos samples of fireproofing @ 1035.
BP-CMN-ASB-17 & 18 & 19.

1050 - Collect additional soil sample from conc. burned area. Soil has more
BP-CMN-SS-19.
green & blue grains present. Appears to be copper. Pile size @ 10x10x2
1.5 cy.

1110 - Begin Southern building HBMS
- fluorescent lights =
4', 4 bulb = ~~65~~ 100
8', 2 bulb = 5

4 DRYWALL TYPES
① FLAT
② SQUARE PATTERN
③ POCKED
④ ~~Lam w/ fiber~~ Fiberboard laminant
ADD on →



List of Suspect Materials

GWB – FLAT (20, 21) ~~1130~~
~~1140~~ – Square pattern panels (22, 23, 24)
~~1150~~ – pocked pattern panels (25, 26)
~~1200~~ laminate wall board (29, 28)
Ceiling tiles (29, 30) – Rain drop – 1210
(31, 32, 33) – Spray 1220

could not access air cell on roof insulation throughout entire bldg.

Structure is metal frame with metal siding on concrete foundations. fiberglass insulation ~~on~~ exterior walls. metal window frames w rubber & silicone sealants. pipes not insulated.

1250 – Collect sample from covered Adit on Rd to Historic Mine Area @ Power line.
BP-HM-ASB-34 – purple vent sealant.

1305 – Arrive @ Harper Shaft.
NO PACM IDENTIFIED

1315 – Collect sample of grout material @ lower Harper Shaft @ Repository.
BP-HM-ASB-~~#~~ 35

1325 – Arrive @ Combination Mill.
Southern metal Bldg is metal nailed to wood w/ fiberglass insulation throughout. no access, locked w/ different lock.

1330 – Collect sample BP-HM-ASB-36 from Vapor Barrier beneath metal roof on small 5x5x8 well pump house

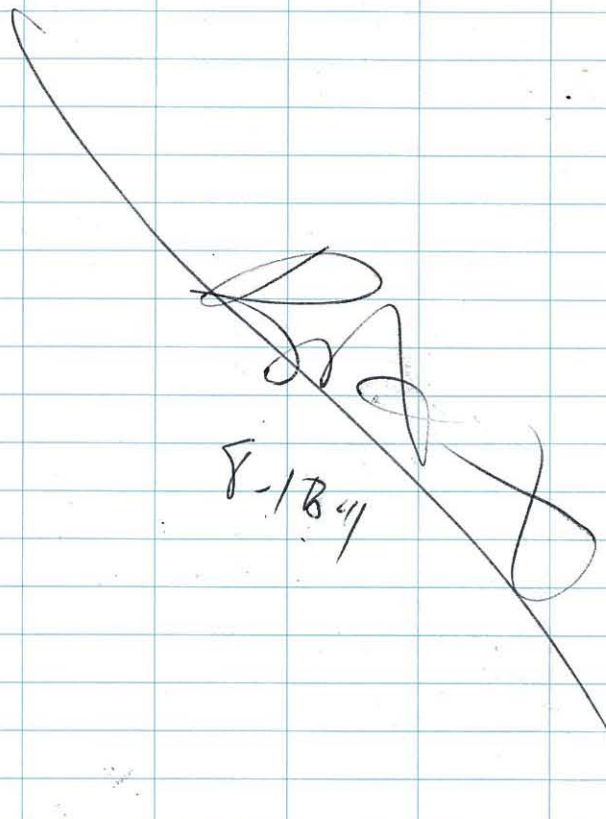
(1400) (1405)
1400 – Collect samples 37 & 38 from Old mill brick grout.
37 is brick grout
38 is lower rock grout

1430 – Collect grout from collapsed building Structure wall located @ SE tailings impoundment Corner. BP-CML-ASB-39

1507 – Arrive @ BP-RW-06 to measure water levels in 06, 07 & 08.
All wells dry.

8.18.11

1535 - drop meter @ office.
1" - complete paperwork
1600 - offsite
1620 - end of day



8-19-11

- 700 - team for site
725 - Met Mark (~~FRITTS~~ BA) and he gives me the water meter.
800 - Arrive @ BP-R4-07 to attempt to GPS location & check water level.
- check BP-R4-06 - DRY
- check BP-R4-08 - DRY

825 - return to Tm South and N. Nav. Buildings only PACM identified remains present insulation w/ vapor barrier samples collected on 8-16-11. insulation only present in front office space 20'x20'x8'

850 - enter building to S. Collect sample BP-HM-ASB-40 of chimney brick grout chimney is 2'x2'x14' high

903 - Collect additional samples of corrugated ~~transite~~ panels on exterior of N. Building. opaque BP-HM-ASB-41 & 42.

10 panels 18" x 5' tall.
41 - S side 42 - N side

3 8' 2bulb Fluorescent lights

8.19.11 BPM

915 - Collect 2 composite roofing material samples (green) from small wooden structure on Rd on way to Tim Smith adit.
BP-HM-ASB-43 & 44

920 - Arrive @ Tim Smith adit. buildings @ tailings area
1-fluorescent bulb in small wood shack to S. (8'-2bulb)

- Same opaque corrugated sheets @ N. building @ 2'x12' on S wall and 2'x8' on north wall, material is to high to access on S wall. collect 1 sample @ N wall.
BP-HM-ASB-45
No other PACM identified @ Tim Smith Area.

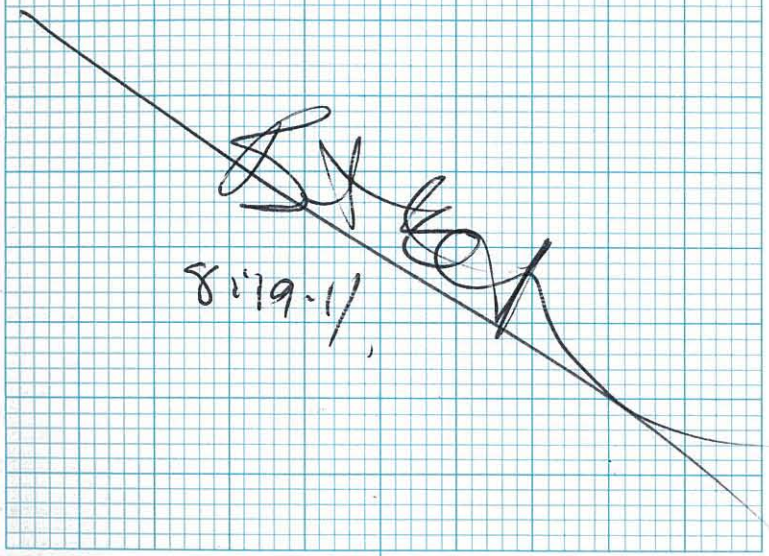
951 - Return water level indicator to office.

- Document Transformers in processing

8.19.11 BPM

building: 1- large 7x5x5 transformer present @ N end of building - labeled as below 50 ppm PCB fluid. (photograph labels).

1030 - leave site for - Missoula office
1200 - Arrive @ office
1203 - Meet PACE courier (Chris)
1210 - unload supplies
1230 - End of day



08/17 BPM on site 8:00

10:00 - Collected sample BP-CML-RCRA-01 FROM OLD MILL ROASTER BRICK AT ~~MINE~~ SITE AT 10:00 am. DRILLED INTO BRICK AND COLLECTED IN 1-gallon zip lock bag.

10:45 COLLECTED SAMPLE BP-CML-RCRA-02 FROM WOOD AT OLD MILL SITE. DRILLED INTO PIECES OF WOOD AND COLLECTED WOOD SHAVINGS

11:04 COLLECTED SAMPLE BP-CML-RCRA-03 FROM SCRAP WOOD ~~WASTE~~ AT NEWER MILL LOCATION. DRILLED INTO DIFFERENT BOARDS TO COLLECT SAMPLES.

11:34 COLLECTED SAMPLE BP-CML-RCRA-04 FROM BRICKS AT NEWER MILL ON EAST SIDE OF ST LOWER WILLOW CREEK. DRILLED INTO BRICKS TO COLLECT SAMPLES

BP TM

11 Black Pine Mine
sunny
on site.
Meeting at top by
01 +-02 to discuss
ly activity.
Svendsen (AS) Herrera
Catarra (GC) Herrera
Hageman (JH) Trihydro
e Darnell (LD) Trihydro
n Houck (KH) Herrera
nie Mongoven (JM) Trihydro
y Bennett (RB) Mungas.

rl - operator (Mungus)
- Devin
- Bob
Sonny
Hans
m will begin grid
npling at Mill site.
S, LD, JH).
n will begin repository
t pits.
H, GC, JM)

Black Pine Mine 7/12/11

0845 Test pit #2 Repository ~32"
samples: BP-RY-SS-02-00
BP-RY-SS-02-02

0850 BP-RY-SS-02-00
Brown loam w/ fractured rock.
dry, veg on surface

0855 BP-RY-SS-02-02
Collected ~ 2.5 feet bgs.
Orangish brown silty loam,
dry.

0912 Test pit #1 ~ 52" gre
Samples BP-RY-SS-01-00
homogen. through profile.
will only collect surface.

0918 Collected sample
BP-RY-SS-01-00
Brown, silty loam, dry
frac. rock.

1000 Test pit #3
top layer 0-1.5'
remarks 1.5 - bottom (14')
Excavator could go deeper.

Black Pine Mine

Sample BP-RY-SS-03-00
wn gravelly silt, dry
g on surface
yer ~ 1.5' deep
Sample BP-RY-SS-03-14
ngish brown silt w/ gravel.
ry.
yer 1.5'-14' bgs.
BP-RY-SS-03.
+ BP-RY-SS-04.
l location across
ity access road due
low overhead lines.
ers:
~~5'~~ (topsoil)
-3' 1'-33"
· bottom (10.5')
3P-RY-SS-04-00
ish brown silt w/ gravel
dry
3P-RY-SS-04-02
ish brown silty gravel,
amp.

1

8m

1133 BP-RY-SS-04-10
Orange gravelly silt, dry.
groundwater at ~ 2.5'

1220 At repository site 05
2 layers
~~0-2'~~ fine
0-6"
6"-2'

1228 BP-RY-SS-05-00
Greyish brown gravelly silt.

1230 BP-RY-SS-05-02
orangish brown silt w/ gravel.

At Tim Smith.
Pace p/u cooler w/ morning samples.

1400 Location BP-TS-RS-01

1408 Sample BP-TS-RS-01-04
Waste Rock, orangish brown gravelly silt.

1410 Sample BP-TS-SS-01-06
Brown silt w/ gravel
dry.

7/12/11 Black Pine Mine
TS-RS-01 test pit

0-4' Waste rock
4' → native soil
angled, matches angle of existing topo.

Angle of clean

1430 TS-RS-03
approx 2' waste rock w/ native beneath
angled w/ slope.

1436 Collected BP-TS-SS-03-03
native
brown silty sand w/ gravel.
dry.

1440 Sample BP-TS-RS-03-02
waste rock
orangish brown gravelly silt.
dry.

1520 Moved -02 closer to berm. NO waste rock collected for. met only.

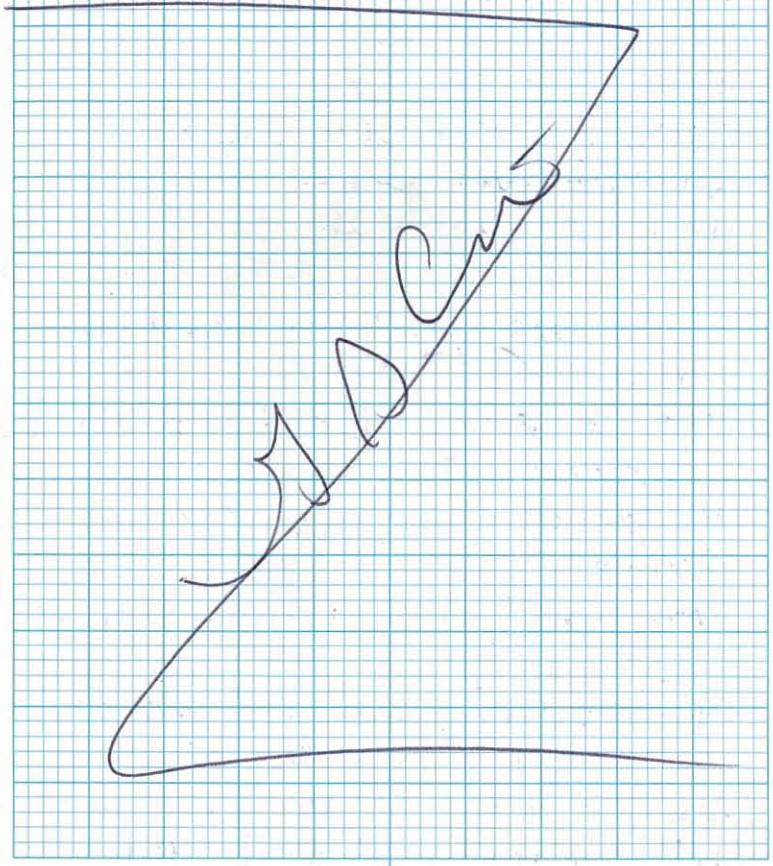
1524 Sample BP-TS-SS-02-02
brown silty sand w/ gravel.

Black Pine Mine 7/12/11

1545 Moving to Tim Smith #2

1600 Lightning moving in to area

1620 Called it a day. Devin (DEQ).



7/13/11 Black Pine Mine
0730 Onsite, 60s, some clouds.
0745 Tailgate Meeting.
Onsite:
AS, LD, JM, GC, KH, Carl.
LD + JM heading to Mill to complete sediment.
GC, AS, KH, Carl heading to Tim Smith #2.
0830 At test pit TS-RS-08. all native soil. Tried another area to the side same material.
0832 Collected BP-TS-SS-08-01 lt. brown silty sand w/ fractured rock.
0849 Collected BP-TS-RS-07-04. Collected from slope. Appears material from upper area dumped on slope. orangish brown gravelly silt.
0855 Collected BP-TS-SS-07-01. DK brown sand w/ gravel (sm) collected from top of ~~stop~~ slope, above WR.
Will not test pit #6,

Black Pine Mine 7/13/11

area is the same as #7.
Heading to Lewis Shaft.
0930 Test pit HM-RS-08. Appears to be native.
0940 Collected BP-HM-RS-08-02. DK brown silty gravel.
0945 COLLECTED BP-HM-SS-15-00 BROWN SANDY GRAVEL WITH TRACE SILT.
1000 At Harrison Shaft.

BP-HM-RS-03. TEST PIT 10:13

DEPTH TO NATIVE SOIL 16" FROM SURFACE
SURFACE - 4" TO 6" OF DARK SOIL ON TOP OF TAILINGS / DUG TO 11FT WITHOUT REACHING BED
1010 Sample BP-HM-SS-03-03 Brown gravelly clay w/ silt.
1015 Sample BP-HM-RS-03-01 orangish brown gravelly silt.
1038 Moving to test pit #2 @ Harrison. Appears to be top layer of dark soil and native beneath (~4"-6" top soil)
Moving to TP #4 for now.

7/13/11 BLACK PINE MINE

1047 Test pit #4 - buried wood/timber, metal.

Surface - gravel rock ~ 3"
3" - 3.5' debris (wood, metal, rock)
3.5' - 5.5' grey (water)
5'5 - 7' orange
7' - 12.5' (bottom) brownish orange (native).

1130 Sample BP-HM-SS-04-10
orangish brown clayey silt.

1135 Sample BP-HM-RS-04-07
orange to dk brown gravely silt. Layer of wet.

1145 TEST PIT BP-HM-RS-01
0-3 FT: GREY GRAVEL WITH SOME SAND
3-4 FT: ORANGE SILTY CLAY WITH LARGE COBBLE + ROCK 0.5-1.5' IN DIAMETER

1230 Collected rinsate (bowl/spoon).
BP-QC-WT-T1

Completed test pit in middle, no distinction.

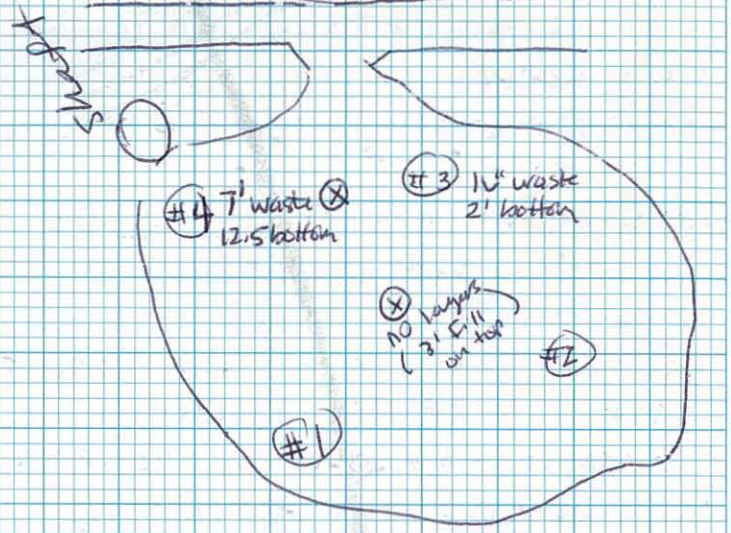
BLACK PINE MINE 7/13/11

1245 SAMPLE BP-HM-RS-01-16.5
ORANGE-BROWN CLAYEY SILT

1247 - STOPPED DIGGING TEST PIT BP-HM-RS-01 AT 16.5 FEET (3 - 16.5 FT ORANGE/BROWN CONTACT)

1250 - TUCK BREAK DUE TO THUNDER/LIGHTENING NEAR SITE

1315 SAMPLE BP-HM-RS-01-06
ORANGISH-BROWN CLAYEY SILT, SIMILAR TO BP-HM-RS-01-16.5 SAMPLE - DECIDED TO TAKE WASTE ROCK SAMPLES @ 0' & 16.5 FT TO DETERMINE EXTENT OF POTENTIAL MINE WASTE

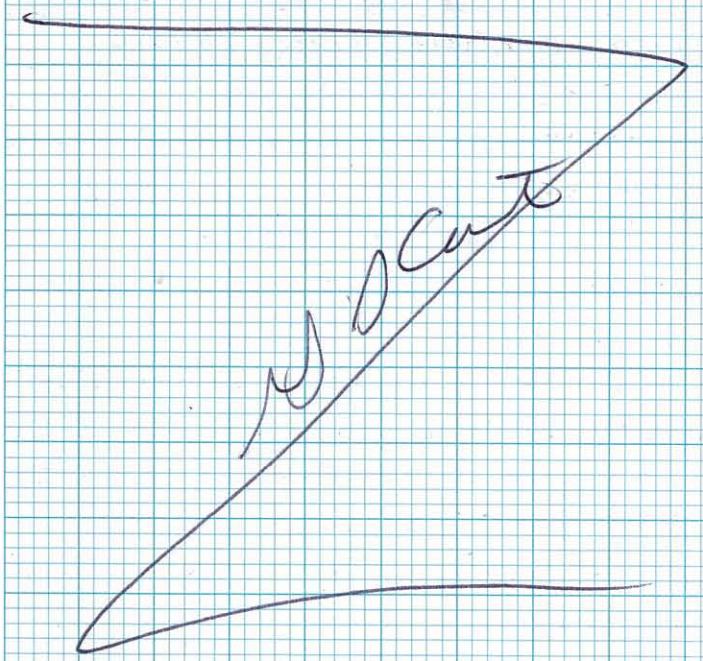


7/13/11 BLACK PINE MINE

1350 SAMPLED BP-HM-RS-02-01
DARK BROWN SANDY SILT WITH VARIOUS SIZED ROCK
1355 SAMPLED BP-HM-RS-02-03
BROWNISH ORANGE SILT/CLAY WITH VARIOUS SIZED ROCK
1430 - PETER JEWISE ARRIVES @ SITE TO CONDUCT INTERNAL (HARRISON) QA OF FIELD SAMPLING/PROCEDURES
1500 - OPERATER FINISHED FILLING TEST PITS (HARRISON), MOVED TO HARPER SHAFT
1520 SAMPLED BP-HM-RS-07-01
BROWN SAND WITH TRACE SILT AND VARIOUS SIZED ROCK
- COMPOSITE SAMPLE COLLECTED FROM 0-1 FEET
1527 SAMPLED BP-HM-SS-07-03
DARK BROWN SAND AND SILT WITH VARIOUS SIZED ROCK
- GRAB SAMPLED FROM 2-3 FEET
1550 SAMPLED BP-HM-RS-06-01
BROWN GRAVELLY SAND + VARIOUS SIZED ROCK
1616 SAMPLED BP-HM-RS-06-02
BROWN GRAVELLY SAND + VARIOUS SIZED ROCK
- GRAB SAMPLED
1615 Sample BP-HM-RS-05-505

Black Pine Mine 7/13/11

Brown gravelly sand - tot Met.
1620 sampled BP-HM-RS-05-02
light to dark brown gravelly sand w/ various rocks.
- tot Met + ABA
1430 Raining/lightning. Called the day.
Carl will meet crew at Combination Mine at 7:30 am.



7/14/11 Black Pine Mine
raining, 40s, cloudy.
0730 Onsite (AS, JH, LD, GC)
Carl walking excavator to
Combination Mine.
0750 Held tailgate meeting.
LD + JH heading to
Harper to collect surface
soil. GC + AS directing Carl
to Combination Mine.
0840 START TEST PIT CMN-SS-05
ENCOUNTERED A LIGHT GREY LAYER
FROM 0-6 FT, GRAVELLY SAND (BROWN) WITH
A MINOR O HORIZON ~3" DEEP AT THE SURFACE
6-7 FT: YELLOWISH GREEN MATERIAL;
DISTINCT LAYER @ 6 FT TRANSITION
7-10 FT: SIMILAR TO 6-7 FT LAYER; INTERSPERSED
BUCKET CONTENTS OF 6-10 FT LAYER:
YELLOWISH GREY GRAVELLY SAND WITH WHAT
APPEARS TO BE WASTE ROCK ORE (ORE DISPLAYS
VARIOUS COLORS OF PURPLE, YELLOW, GREEN, + ORANGE)
- DID NOT OBSERVE A LINER
0900 MOVED APP. 15 FT TO THE NORTH, TEST
PIT VERY SIMILAR TO CMN-SS-05; 0-6 FT
GRAVELLY SAND, BROWN OVERLAYING 6-10 FT

BLACK PINE MINE 7/14/11

LAYER: YELLOWISH BROWN GRAVELLY
SAND WASTE ROCK WITH VARIOUS COLORED ORE
@930 STARTED ANOTHER TEST PIT
AT THE SOUTHERN EDGE OF CAP/WASTE
ROCK AREA APP. 20 FT SOUTH OF CMN-SS-05
0-4 FT BROWN GRAVELLY SAND CAPPING
MATERIAL
4-6 FT YELLOWISH BROWN GRAVELLY SAND
WASTE ROCK WITH ORE
6-9 FT LIGHT PURPLE SAND WITH
TRACE GRAVEL, LIKELY NATIVE SOIL
9-11 FT ORANGE GRAVELLY SAND
LIKELY NATIVE MATERIAL AS WELL
1000 Sample BP-CMN-SS-05-08
orangish brown clayey silt.
with gravel.
1005 Sample BP-CMN-RS-05-05
lt. greenish brown sandy gravel
w/ some silt. Tot. Met / ABA.
1010 Sample BP-CMN-SS-05-00
light brown sandy gravel with some
silt.
1050 STARTED TEST PIT BP-CMN-SS-06-
1110 TEST PIT DESCRIPTION: 0-1 FT:
BROWN GRAVELLY SAND COVER SOIL
1-2 FT: YELLOWISH BROWN WASTE ROCK
2-2.5 FT: BLACK TOPSOIL
2.5-7 FT BROWN SANDY GRAVEL,
POTENTIALLY NATIVE SOIL

7/14/11 BLACK PINE MINE

1115 SAMPLED BP-CMN-SS-06-00
MEDIUM BROWN SANDY GRAVEL
1120 SAMPLED BP-CMN-RS-06-02
YELLOWISH BROWN WASTE ROCK
1125 SAMPLED BP-CMN-RS-06-00
BROWN GRAVELLY SAND
1200 BEGIN DIGGING TEST PIT BP-CMN-SS-04
0-1.5 FEET BROWN GRAVELLY SAND COVER/CAP
1.5-6 YELLOWISH BROWN SANDY GRAVEL WASTE ROCK
6-9 FT BROWN GRAVELLY SAND NATIVE SOIL
WITH EVIDENCE OF O HERIZON @ LEFT TRANSITION
- NOTE: WASTE ROCK APPEARS TO BE
GETTING DEEPER TO THE SOUTH (MOUNDING)
1230 SAMPLED BP-CMN-SS-04-00
BROWN GRAVELLY SAND, NATIVE SOIL LAYER
1235 SAMPLED BP-CMN-RS-04-02
YELLOWISH BROWN WASTE ROCK
1240 SAMPLED BP-CMN-RS-04-05
YELLOWISH BROWN WASTE ROCK
1245 SAMPLED BP-CMN-SS-04-00
BROWN SANDY GRAVEL / CAPPING MATERIAL
1325 BEGIN TEST PIT BP-CMN-07
0-6 FT DARK BROWN GRAVELLY SAND WITH
TRACE WASTE ROCK

BLACK PINE MINE 7/14/11

6-9 FT = LIGHT BROWN/ORANGE GRAVELLY
SAND
1335 SAMPLED BP-CMN-SS-07-00
- DARK BROWN GRAVELLY SAND
1340 SAMPLED BP-CMN-SS-07-06
- LIGHT BROWN/ORANGE GRAVELLY SAND
1355 START TEST PIT BP-CMN-08
0-4 FT DARK BROWN GRAVELLY SAND
4-7 FT LIGHT BROWN/ORANGE SAND WITH
TRACE GRAVEL
1405 SAMPLED BP-CMN-SS-08-00
DARK BROWN GRAVELLY SAND
1410 SAMPLED BP-CMN-SS-08-03
LIGHT BROWN/ORANGE SAND W/TRACE GRAVEL
1425 START TEST PIT BP-CMN-09
0-0.5 FT DARK BROWN ORGANIC HORIZON, SAND
0.5-8 FT LIGHT BROWN/ORANGE GRAVELLY SAND
1430 SAMPLED BP-CMN-SS-09-00
DARK BROWN GRAVELLY SAND WITH HIGH
ORGANIC CONTENT
1435 SAMPLED BP-CMN-SS-09-04
LIGHT BROWN/ORANGE GRAVELLY SAND
1445 STARTED TEST PIT BP-CMN-10
0-0.5 DARK BROWN GRAVELLY SAND W/TRACE SILT
0.5-4 LIGHT BROWN GRAVELLY SAND
4-6 LIGHT BROWN/ORANGE GRAVELLY SAND
1455 SAMPLED BP-CMN-SS-10-00
DARK BROWN GRAVELLY SAND W/TRACE SILT
AND HIGH O.M. CONTENT; TOPSOIL

7/14/11 BLACK PINE MINE

1500 SAMPLED BP-CMN-SS-10-04
TRANSITION FROM LIGHT BROWN TO ORANGE GRAVELLY SAND
1510 STARTED TEST PIT BP-CMN-14
0-1 FT: SAND WITH TRACE GRAVEL AND LOTS OF ORGANIC MATTER
1-5 FT: LIGHT BROWN GRAVELLY SAND
1515 SAMPLED BP-CMN-SS-14-00
- PRIMARILY SAND WITH HIGH O.M. CONTENT
1520 SAMPLED BP-CMN-SS-14-04
- LIGHT BROWN GRAVELLY SAND
1540 STARTED TEST PIT BP-CMN-13
0-1FT SAND, WOOD, AND ORGANIC MATTER
1-6 FT: LIGHT BROWN GRAVELLY SAND
1550 SAMPLED BP-CMN-SS-13-00
DARK BROWN SAND WITH WOOD + O.M.
1555 SAMPLED BP-CMN-SS-13-04
LIGHT BROWN GRAVELLY SAND
1605 STARTED TEST PIT BP-CMN-12
0-0.5 FT DARK BROWN SAND + O.M.
0.5-5 FT LIGHT BROWN TO ORANGE GRAVELLY SAND
1615 SAMPLED BP-CMN-SS-12-00
DARK BROWN SAND WITH O.M.
1620 SAMPLED BP-CMN-SS-12-04
LIGHT BROWN SAND WITH SOME GRAVEL

Black Pine Mine 7/14/11

1630 STARTED TEST PIT BP-CMN-11
0-1.5 FT SANDY SILT WITH TRACE GRAVEL + O.M. THROUGHOUT, BROWN
1.5-6 FT GRAVELLY SAND LIGHT BROWN TO ORANGE
1640 SAMPLED BP-CMN-SS-11-00
SANDY SILT, BROWN, O.M. THROUGHOUT
1645 SAMPLED BP-CMN-SS-11-04
LIGHT BROWN-ORANGE GRAVELLY SAND
1530 Left site

7/15/11 Black Pine Mine
40s, foggy, some clouds
0630 Arrived on site
0645 Held tailgate meeting.
GC
AS
LD
JH
Carl
JH will begin building inventory. Others will begin test pit locations in Mill area.
0704 Arrived at first location. CML-TS-11.
LD, AS, GC have passive sampler for inorganic mercury.
0712 Test pit CML-TS-11
0735 Sample BP-CML-TS-11-01
lt brown silty sand w/ some gravel. dry
0740 Sample BP-CML-TS-11-08
Orangish brown gravelly clay w/ some silt.
0820 At "012 Mill" site. CML-TS-10.

Black Pine Mine 7/15/11

0850 Collected BP-CML-TS-10-00
Reddish to lt brown sand.
0852 Collected BP-CML-TS-10-02
reddish brown fine sand.
0854 Collected BP-CML-TS-10-06
Brown sandy gravel SS
0920 Decon'd excavator bucket. Heading to TP#1
0940 Sample BP-CML-TS-01-00
Amended - total Hg + Moisture only per KH.
Brown silty sand, some gravel.
0942 Sample BP-CML-TS-01-02
brown to gray silty clay w/ some gravel. Added ABA per KH.
0945 Sample BP-CML-SS-01-06
Grey sand w/ cobble, wet.
1000 Heading to CML-TS-02
1010 Sample BP-CML-TS-02-00
grey to black gravelly sand, w/ organic layer at top.
1015 Sample BP-CML-TS-02-02
Black to brown sandy clay.
1017 Sample BP-CML-SS-02-06
lt brown sand w/ large cobbles.

7/15/11 Black Pine Mine
1025 Decon bucket
1040 Sample BP-CML-TS-03-00
brown sandy gravel
1043 Sample BP-CML-TS-03-02
orangish brown fine sand.
1045 Sample BP-CML-SS-03-06
gray silty gravel, large cobbles.
1105 Sample BP-CML-TS-04-00
Brown gravelly sand
1107 Sample BP-CML-TS-04-02
Brown/orange gravelly sand.
1110 Sample BP-CML-SS-04-06
Brown silty gravel, wet
1133 Sample BP-CML-TS-05-00
grayish brown sandy clay, wet)
1135 Sample BP-CML-TS-05-02
orangish brown gravelly sand.
1140 Br Sample BP-CML-SS-05-04
brown clayey silt, cobbles.
1210 Sample BP-CML-TS-06-00
Brown silty sand
1213 sample BP-CML-TS-06-02
Brown/orange sand.

Black Pine Mine 7/15/11
1215 Sample BP-CML-TS-06-05
black-gray clayey gravel, wet.
1232 Sample BP-CML-TS-07-00
Orangish brown gravelly sand
1235 Sample BP-CML-TS-07-02
lt brown silty sand
1237 Sample BP-CML-SS-07-05
Brown gravelly sand.
1255 sample BP-CML-TS-08-00
lt. brown sandy gravel.
1258 Sample BP-CML-TS-08-05
orangish brown - brown clayey gravel.
1300 ℄ Sample BP-CML-SS-08-0
gray gravelly clay, damp
1335 BP-CML-TS-09-00
Brown sand w/ some green
1337 BP-CML-TS-09-02
red sand
1339 BP-CML-TS-09-04
Yellow sand
1340 BP-CML-TS-09-06
green/brown sand, some yellow

7/14/11 Black Pine Mine

50s, cloudy, rain at times

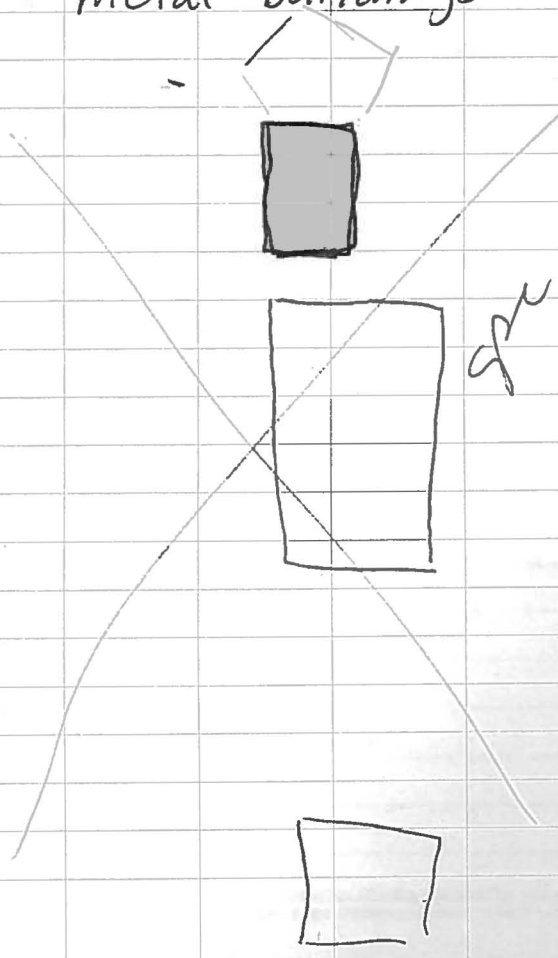
1204 At Combination Mine.

Inspecting:

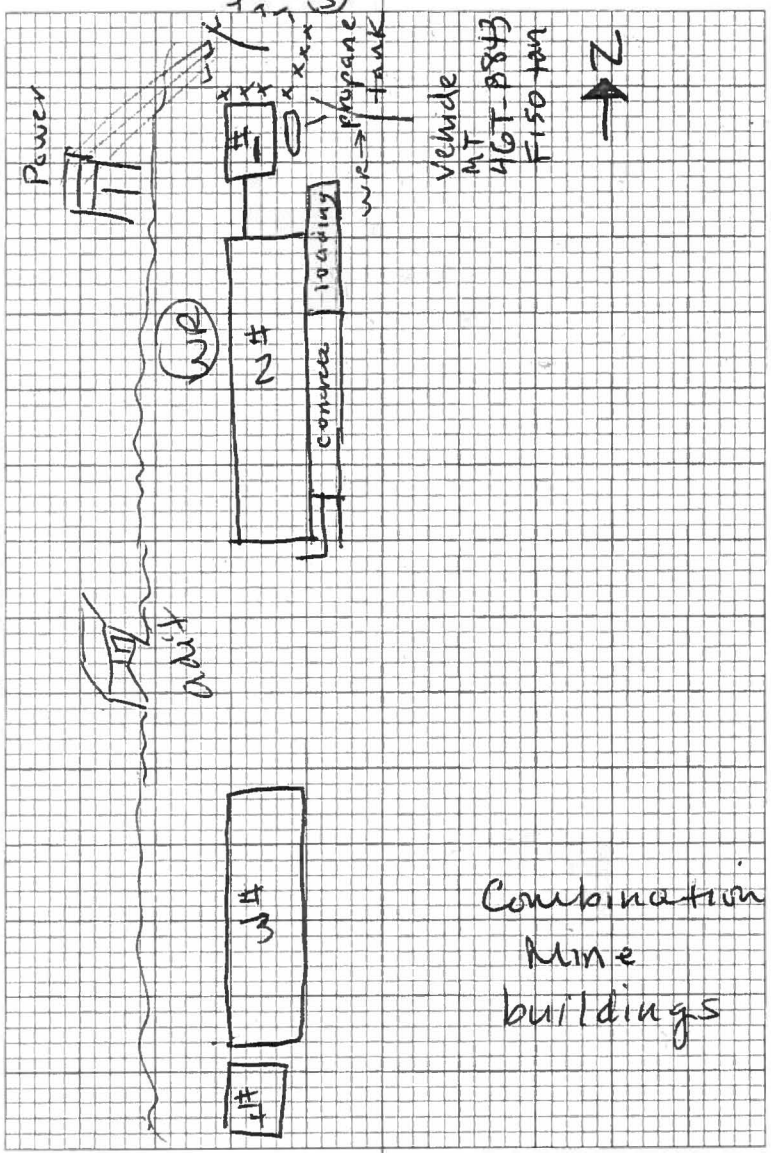
Auxpliary adit

Primary adit

Metal buildings



Black Pine Mine 7/14/11



7/14/11 Black Pine Mine

building #1

Corrugated metal sides and roof, concrete floor. lock is DEQ (existing). Wood board walls (inside). Approx 15' angled roof.

4 2-~~blulp~~ tube fluorescent light fixtures

Insulated roof

Main power, generator.

pump power.

ladder (extension)

Items:

Various electric cable

power cords

wood shelving

55 gal drum (~~corro~~ rusted) sx w/ ~~insultation material~~ "calcium pellets"

2 1-gal antifreeze (3/4 full) (1/3 full)

1 gal engine oil (1/4 full)

25 lb bag ice melter (almost empty)

empty motor oil (2 - 1 quart, 1 1-gal)

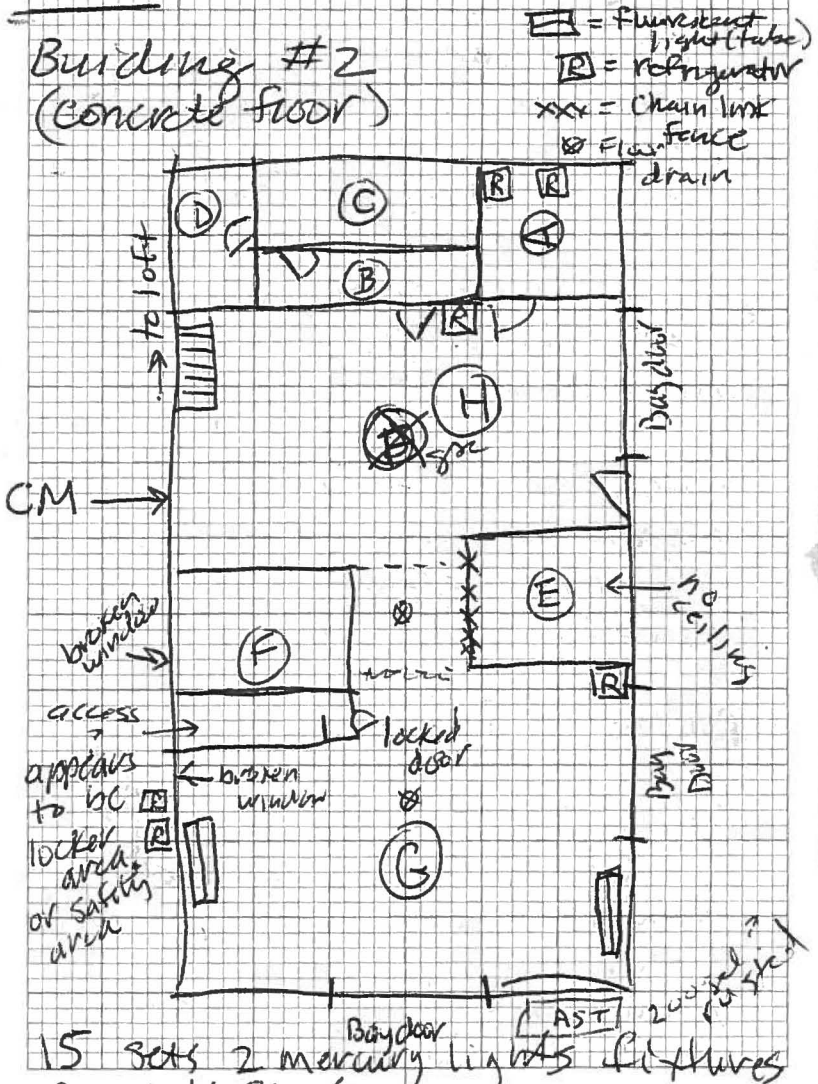
2 55-gal metal drums in spill boxes, unmarked, prob. used oil.

Black Pine Mine 7/14/11

photos #35-47 (bldg #1)

Building #2

(concrete floor)



7/14/11 Black Pine Mine

building 2-A
office (use).
insultation on ceiling and outer walls. Fiber, styrofoam under window
2 sets of 2-tube light fix.

ceiling: owens corning R-11
3 1/2" fiberglas® insulation.
walls: unmarked.

stove, desk, couch, electronics
propane, water level meters
cleaning supplies
fuses.

photos 47-53

Building 2-B
2 sets 2-tube fluorescent lights
Vinylflow hoses
other tubing/hoses
wood sheet walls and ceiling
photos 54-56

Black Pine Mine 7/14/11

Building 2-C
4 metal shelving units
work bench
2 sets 2-tube light fixtures
various pipe fittings
power boxes, switches, circuit breakers.
insultation on exterior wall only. (2 types, at least)
photos 57-59

Building 2-D
wood sheet walls, wood ceiling.
insulation on exterior walls
4 metal cans (fuel?) or solvent (2 full)
Appears to be parts cleaning.
wood shelves, work bench.
Exterior vents.
1 2-tube light fixture.
photos 60-66

7/14/11 - Black Pine Mine

Building 2-10ft.

3 2-tube light fixtures
Insulated walls + ceiling
air filter storage
5-gal bucket grout
silicone sealant
various debris.
2 metal shelving units
mice
Empire heating system unit
model UH-140-FSP
serial F45 21156 WR

photos 67-77

Building 2-H

wall of fittings / parts.
hoses
4 tires
filters
Insulation on walls (ext)
empty fuel containers
1-gal brake fluid

Black Pine Mine 7/14/11

Spray can Rust oleum
Fast dry hard hat
ABC fire extinguisher
pipes (metal)
photos 78-88

Building 2-E

Insulated ext. wall, no ceiling.
no wall (interior), fence.
Compressor:
Campbell Hausfeld
model LR45245
10/29/82 TF430621H
Miners first aid station
wood work benches, water heater
miscellaneous parts, empty green container
Full 2-gal "safety can".
photos 89-96 97
2 canisters (gas, pressurized)

Building 2-F

metal siding on all walls
4-drawer file cabinet (empty)

7/14/11 Black Pine Mine

2.5 lbs fuel solidifier (P/G)
parts, maps
5-gal 76 bucket (full)
2 drawer file w/ work logs

12 4-tube light banks
photos 98 – 103

Building 2 – G

Floor drain
Capscrew shelving unit (wood)
Washer storage unit (metal
Mitee thread cutting oil (dark)
1 Qt – 1/2 full
2 5-gal buckets, partially filled (oil ?)
ABC Dry chemical ext. (2)

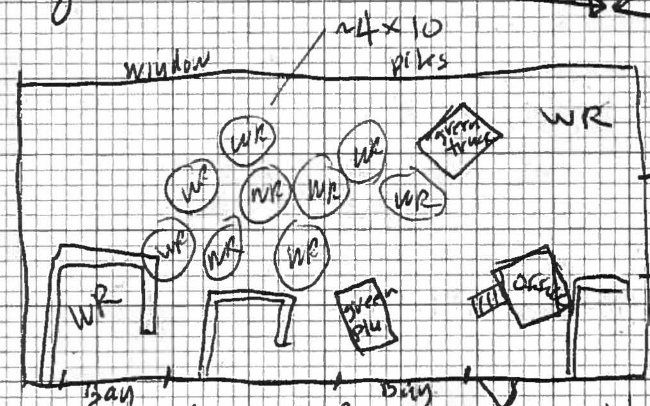
3 5-gal buckets (motor oil ?)
electrical panel
Styrofoam insulation
√ 3 50 core boxes.
Heating unit (Empire)
2 5-gal buckets (1/4 full) diesel engine oil

Black Pine Mine 7/14/11

Sylvania Single phase
75KVA 60HZ
power transformer
photos 104 – 117
photo 118 – #123 bldg 2 (one of bldg 1)

photo 124 – bldg 3
to 130 (exterior)
photo 129 looking into MH.
1540 Went to meet lab courier. ~~to go~~ Have 3 coolers ready for pickup.

Bldg 3 – many holes / damage



Corrugated metal, spray insulation on walls and ceiling.
Dirt floor / concrete in places

7/14/11 Black Pike Mine

Bldg 3 materials

~~go~~
2 3 bags Electro Minerals Ferrosilicon

~500 g UST (rusted)

metal stairs, walkway

- Westinghouse transformer
  1000 KVA 2400 - 480 volts
  514 gal oil
  serial 7372702
  certified non-PCB.
- fuse boxes
- safety switches
- ~500 gal AST (2) in green truck
- Electrical panel
- bay door roller
- light fixtures removed.
- various metal parts

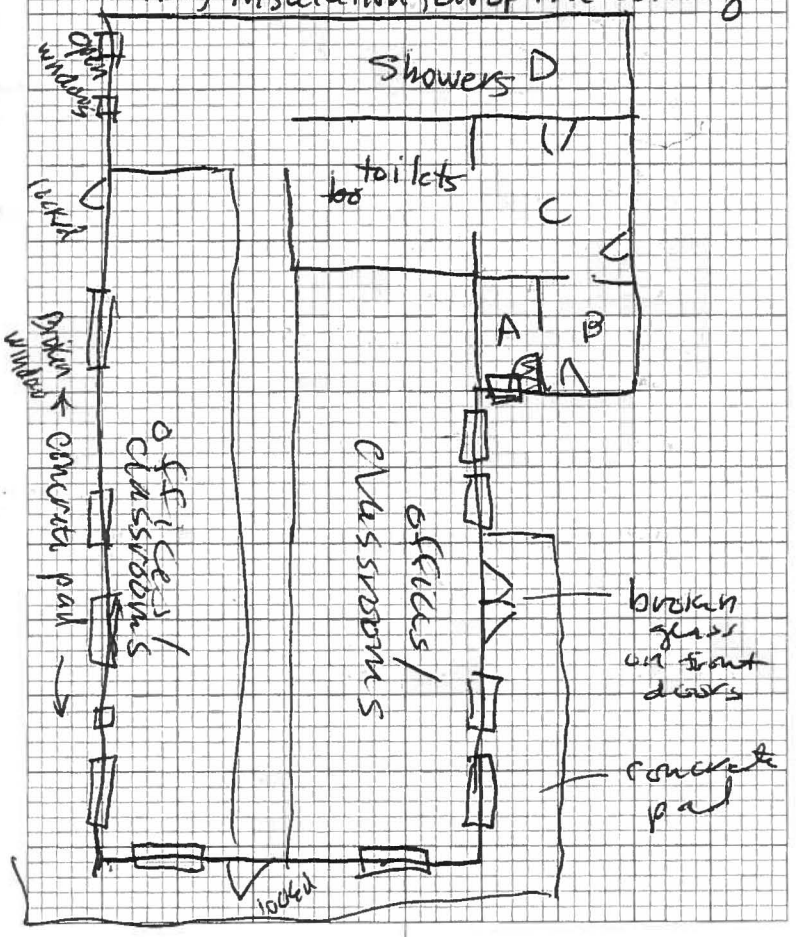
photos 131 - 144 bldg 3

Beark Pine Mine 7/14/11

Bldg 4

exterior photos # 145 - 150

concrete foundation
CM sides/roof
ceiling insulation, droptile ceiling



7/14/11 Black Pine Mine

Bldg 3-A/B
drop tile ceiling
Metal walls
some board, 5 gal SpeedPlug.
8 light fixtures, fluorescent
Concrete floor
photos 151 - 154

Bldg 3-C
Ceiling insulation
Metal walls
5 2-tube lights.

Bldg 3-D showers

mattress / debris
rodent droppings

Most of structure has
Concrete floor
dropped ceiling tiles
Metal walls
fluorescent fixtures.

7/15/11 Black Pine Mine

60's Clear, Sunny

0730 @ Combination Mine

Inspecting:

Primary Adit:

~~Auxiliary Adit~~ (Camera Red Olympus 10 megapixel)

Primary Adit (Photos 100-0026 - 100-0029)

Dimensions: 30 ft deep / 9.5 ft tall / 12.5 ft wide (width tapers from 12.5 ft at bottom to 10.5 ft at top)

- Moist entrance with moss growing.
- Double hinge plywood entrance with chain and DER lock.
- Entrance structure moderately sound.
- Roof support wood has a noticable bend with very moist (dripping) wood.
- Outside of entrace structure, chain-link fence is used to secure bedrock.
- Two black plastic pipes run out of entrance (One 3.50 inches O.D., other 1.25 in O.D.).

Wood (Power Building?) structure just outside of adit (Locked with heavy duty "American" lock)

→ See Picture #100-0050

7/15/11 BLACK PINE MINE

LOW 60'S, SUNNY, LIGHT BREEZE

0900 @ TIM SMITH MINE

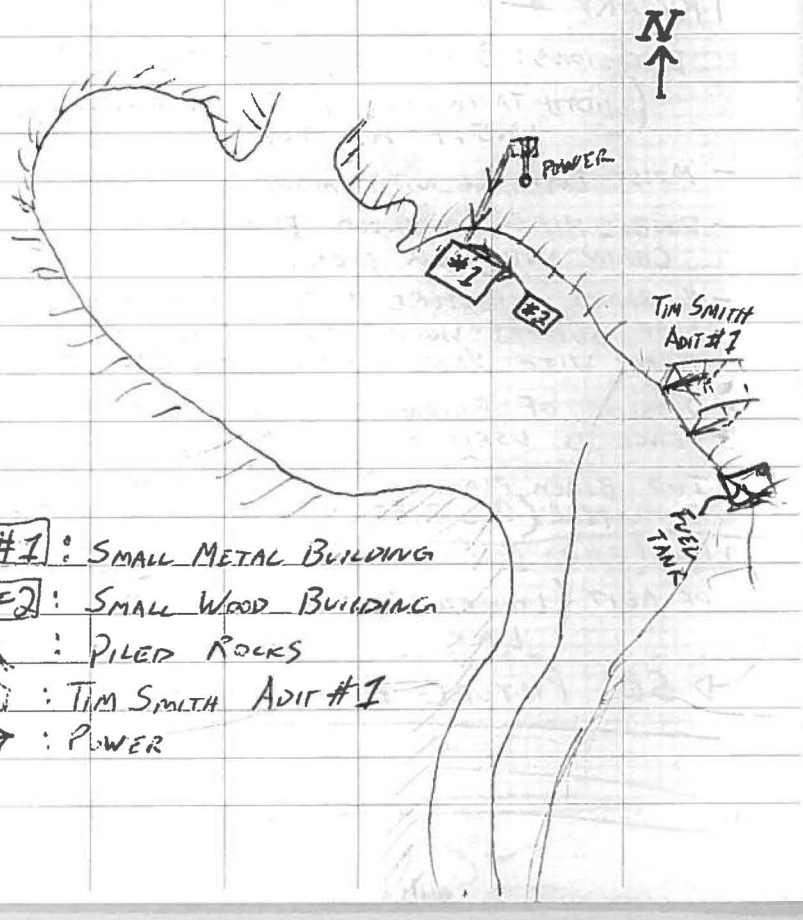
INSPECTING:

TWO SMALL BUILDINGS: ONE METAL & ONE WOOD

TIM SMITH MINE ADIT #1

TIM SMITH MINE ADIT #2

SURROUNDING AREA (IMMEDIATE)



#1 : SMALL METAL BUILDING

#2 : SMALL WOOD BUILDING

: PILED ROCKS

: TIM SMITH ADIT #1

→→ : POWER

7/15/11 BLACK PINE MINE

TIM SMITH BUILDING #1

PHOTO #'S: 100-0031 → 100-0033 (OUTSIDE)

~~100-0034 (INSIDE)~~ DH

OUTSIDE:

- CORRUGATTED METAL SIDES AND ROOF
- STICK FRAMED BUILDING ON A 12 INCH FLOATING CONCRETE PAD
- MASTER LOCK ON SOUTH-EAST DOOR WAS CLIPPED AND REPLACED WITH DEQ LOCK.
- 6 INCH O.D. METAL PIPE RUNS FROM TIM SMITH ADIT #1 ALONG NORTHERN HILL AND THEN INTO THE NORTHERN SIDE OF THE BUILDING
- POWER COMES FROM NORTHERN HILL AND ENTERS NORTERN SIDE OF BUILDING. LARGE (1.5 INCH O.D.) POWER CORDS EXIT BOTTOM OF NORTHERN SIDE OF BUILDING AND RUN TOWARDS TIM SMITH ADIT #1.
- HOLE (4.5 FT WIDE BY 4.0 FT TALL) CUT IN NORTHERN SIDE OF BUILDING. PLYWOOD COVERS HOLE FROM THE INSIDE.
- TWO 5.0 FT SLIDABLE DOORS ON SOUTHERN SIDE (~10.0 FT TALL). LOCKED WITH HEAVY DUTY MASTERLOCK.

OUTSIDE DIMENSIONS / STRUCTURAL INTEGRITY

16 FT WIDE / 20 FT LONG / 11 FT (EDGE) → 14.5 FT (PEAK) TALL

STRUCTURE APPEARS TO BE STABLE, LOTS OF EXTERIOR DENTS, RIPPLE IN ROOF

7/15/11 Black Pine Mine

Tim Smith Building #1

INSIDE: Photo #'s 100-0034 → 100-0036 (inside)

- Large Amount of Rodent Droppings Throughout.
- All one Room with Plywood Walls and Ceiling.
- 2 Large Fluoresent Tube Lights in center of Ceiling on a 2 Tube Fixture
- 3 Tin Pans, Chunk of Plastic Pipe (1.5 in O.D.), 2 Blocks of Wood, 2 Cans of "Multi-Purpose ATF" (Transmission Fluid, 1 Qt each), 1 Dirty Milk Jug, and 2 Plastic Jugs Cut in Half; on the Floor Inside
- Various Electrical Boxes and Cords Inside Attached to Northern Wall (Photo # 100-0035)
- Large Metal Pipe with Valve Hanging Inside (Photo # 100-0035)
- Heating Unit Attached to Western Wall (Photo # 100-0036)
- Two Hanging Paper Gaskets on Wall
- Coiled "9 Gauge" Wire Hanging on Wall

JH

7/15/11 Black Pine Mine

Tim Smith Building #2

Outside: Photo #'s 100-0037 → 100-0039

- Wood Building Sitting on Steel I Beams that are Supported by Rocks on Backside, & Wood in Front. Steel Beams have Holes Rusted Through them. Corrugated Metal Roof.
- Exterior Wood has Holes in it and is Detaching in Places. Some Bird Nesting Material seen Between Exterior/Interior Walls.
- No Lock on Front Door, only One Hinge Keeping Door from Falling Off. Door Held Shut with Two Rocks.
- Windows on Three Sides, only One Visible Crack in One Pane.
- Concrete Pad ("1993" Engraved) Poured in Front of the Door (4 Ft 4 In by 3 Ft 7 In)

Dimensions

- 8 Ft 8 Inches Wide / 14 Ft 6 Inches Long

Shed Roof: 8 Ft Taper to 7 Ft

- Structure is in Bad Shape (As Described Above)

JH

7/15/11 BLACK PINE MINE

TIM SMITH BUILDING #2

INSIDE: PHOTO #'S: 100-00 → 100-0045

- LARGE AMOUNT OF DEBRIS, NO TABLE TO ENTER. FLOOR COMPLETELY COVERED WITH DEBRIS.
- TWO BLUE/WHITE UNION DRUMS FILLED WITH VARIOUS THINGS (GRASS, WIRE, METAL CONNECTOR PIECE, .)
- LARGE PILE OF TUBING COVERED WITH OIL-LIKE PRODUCT.
- TWO GASOLINE TANKS (~10gal/5gal) EXTREMELY FLAMMABLE.
- LOTS OF RODENT DROPPING. VISIBLE RACCOON FIRMA ON
- LARGE PILE OF METAL RODS WITH SQUARE HEADS ON ONE END
- VARIOUS METAL PIPE CONNECTOR PIECES.
- SOME STRAY ROOM 3), 2 SLEDGE HAMMERS, 1 PICK, 3 CHAIRS, AND TABLE/BENCH.
- SMALL BEE HIVE/HORNETS NEST HANGING ON CEILING.
- TWO MEDIUM SIZED DRUMS (ONE BLACK, ONE WHITE) FILLED WITH VARIOUS ITEM.
- ONE 55 GALLON DRUM, CAPPED.
- BENCH (UNDER TABLE) HAS OIL-LIKE PRODUCT COVERING THE SURFACE
- TWO FLUORESCENT TUBE LIGHTS ON CEILING/BREAKER BOX ON BACK WALL.

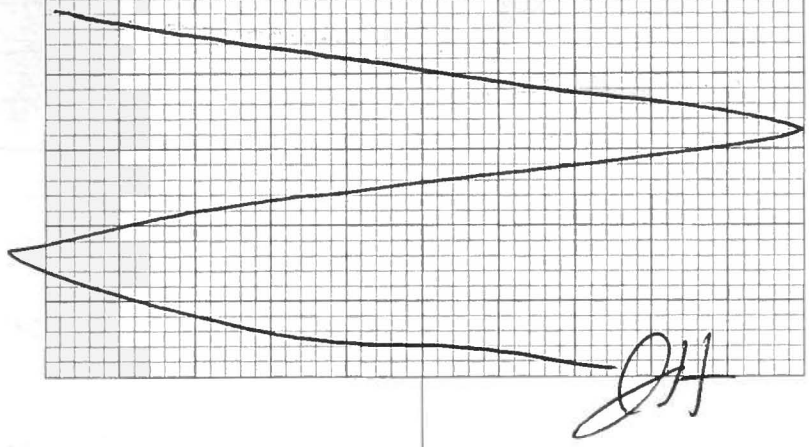
7/15/11 BLACK PINE MINE

TIM SMITH ADIT #1

- ADIT ENTRANCE IS COLLAPSED, ONLY PLYWOOD DOORS STANDING.
- ~~LARGE~~ MASTERLOCK ON DOORS ~~[redacted]~~ JH

→ PHOTO #'S 100-0046 & 100-0047

- COLLAPSED AREA IS ROUGHLY 32 FT WIDE BY 60 FT LONG (DEPTH RANGES FROM 0FT TO 20 FEET)
- POWER CABLES AND LARGE METAL PIPE RUN FROM ADIT ENTRANCE TO BUILDINGS (PHOTO # 100-0048)
- LARGE ORANGE "BLOWER"? SITS OUT FRONT OF ADIT ENTRANCE WITH HIGH VOLTAGE POWER CORDS RUNNING TO IT (PHOTO # 100-0049). IT IS BUILT UP WITH A WOODEN POST STRUCTURE.



JH

7/15/11 BLACK PINE MINE

TIM SMITH MINE SITE INSPECTION

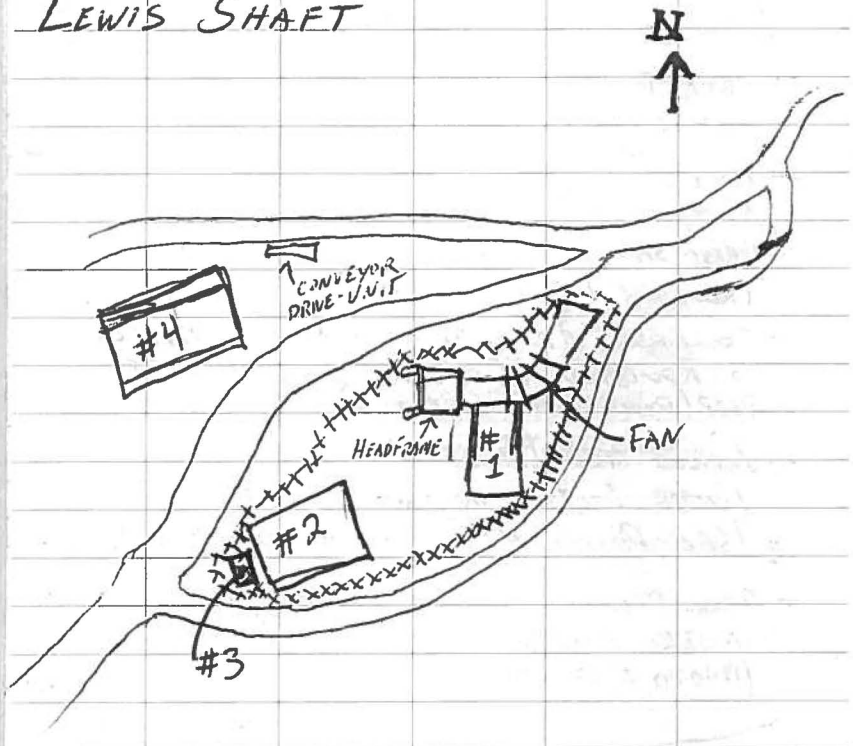
- LARGE FUEL TANK SITS PROPED ON HILL EAST OF BUILDINGS (SEE PHOTO #'s 100-0050 & 100-0051)
- SOME METAL PIPES AND EMPTY FIRE EXTINGUISHERS (2) ON THE GROUND OUTSIDE ADIT #1 AND BUILDING #2.
- PHOTO 100-0052 SHOWS ROAD ENTRANCE FROM SOUTH LOOKING NORTH WEST. ROCK CUTTINGS ARE BERMED TO CREATE FLAT AREA FOR ENTRANCE TO MINE AND BUILDINGS.
- PHOTO 100-0053 SHOWS LARGE PILE OF ROCKS THAT CONTAIN SOME CHUNKS OF METAL PIPE AND OTHER DEBRIS (PHOTO IS LOOKING NORTHWEST, STANDING NEAR BUILDING #2).

/5/ BLACK PINE MINE

TIM SMITH ADIT #2

- ENTRANCE COLLAPSED, FIRST 15 FT OF ENTRANCE STRUCTURE IS STILL STANDING. (SEE PHOTO #100-0054). CHAIN-LINK FENCED OFF.
- AREA DIRECTLY ABOVE/BEHIND ENTRANCE IS ALSO CAVING IN.
- ROCKS CUT FROM SHAFT ARE DEPOSITED NORTH OF THE SHAFT ENTRANCE ACCROSS THE "FOREST SERVICE" ROAD (SEE PHOTO #100-0055) (ROUGHLY 125 FT LONG, 15 FT WIDE, 15 FT DEEP)
- COLLAPSED AREA AROUND ADIT ENTRANCE IS ROUGHLY 60 FT LONG, 30 FT WIDE, 25 FT DEEP (DEPTH VARIES GREATLY).
- VARIOUS SIZES (LARGE QUANTITIES) OF DIMENSIONAL LUMBER LOCATED IN AND AROUND THE ADIT (SEE PHOTOS #100-0056 → 100-0058).
- ROCK PILES WITH LOTS OF WOOD LOCATED IN THE SURROUNDING TREES (UN-NATURAL) (PHOTO #100-0059).

7/15/11 BLACK PINE MINE
60's SUNNY, LIGHT BREEZE
1230 HISTORIC MINE AREA
LEWIS SHAFT



XXX : CHAIN-LINK FENCE
#1 :
#2 :
#3 : OUTHOUSE (DOOR CAN NOT OPEN)
#4 :

7/15/11 BLACK PINE MINE

LEWIS SHAFT (HISTORIC MINE AREA)

- GENERAL AREA PHOTOS #100-0060 → 100-0068
- CHAIN LINK FENCE AROUND SHAFT AND BUILDINGS 1, 2, & 3 IS STRUCTURALLY SOUND EXCEPT FOR GATE (NEAR BUILDING 1), AND IMMEDIATLY NORTH OF GATE.
- GATE IS LOCKED WITH DEQ LOCK.
- HEADFRAME, FAN, & CONVEYOR DRIVE UNIT SEEM STRUCTUARLY SOUND. ONE LARGE HEAVY DUTY LOCK EXISTS ON THE NORTH SIDE OF THE UNIT (POSSIBLE MAINTENANCE COMPONENT OF BUILDING) [PHOTOS #100-0069 → 100-0072]

BUILDING #1 (OUTSIDE):
PHOTO #s 100-0073 → 100-0075 (OUTSIDE)

ATTACHED TO HEADFRAME, FAN, ~~CONVEYOR~~ ~~DRIVE~~ UNIT.

- METAL SIDING & ROOF, SITTING ON A CONCRETE PAD
- TWO LARGE SLIDING WHITE METAL FRONT DOORS LOCKED WITH A THICK MASTERLOCK.
- WINDOWS ON SOUTHWEST SIDE BROKEN THROUGH.
- ONE WINDOW ON NORTHEAST SIDE BROKEN.
- LARGE ELECTRICAL BOX AND CONDUITS MOUNTED ON SOUTHEAST SIDE (CONDUITS RUNNING TOWARD FAN/CONVEYOR DRIVE UNIT).
- LARGE CONDUIT FROM FAN [~~CONVEYOR DRIVE~~ OH] ENTERING BACK OF BUILDING

DIMENSIONS: BUILDING IS STRUCTURALLY SOUND (APPEARS SOUND)
12 FT LONG / 12 FT WIDE / 12 FT TALL (EDGE) PLUS 1 FT TO PEAK.

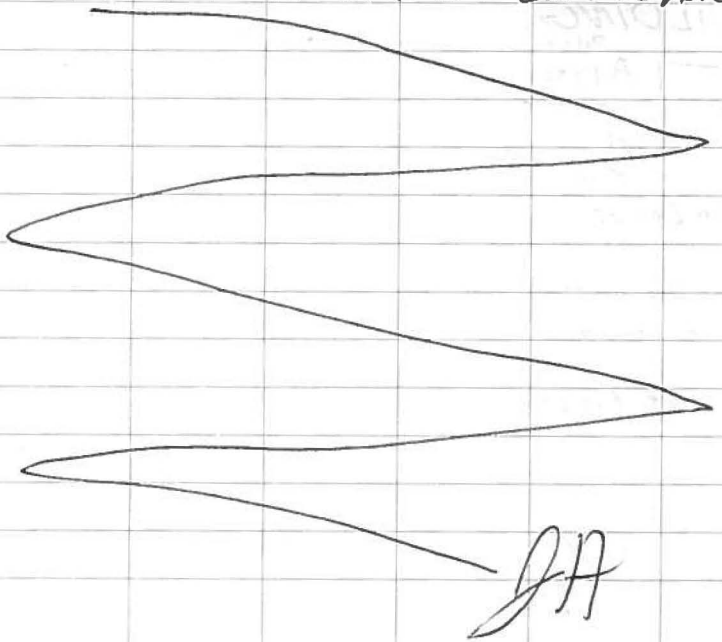
7/15/11 BLACK PINE MINE

LEWIS SHAFT (HISTORIC MINE AREA)

BUILDING #1 (INSIDE):

PHOTOS # 100-0076 → 100-0078

- RODENT DROPPINGS ON FLOOR
- TWO LARGE VENTS (ONE ON NORTH, ONE ON SOUTH WALL)
- LARGE POWER UNIT (WITH CONDUIT RUNNING TO THE FAN) IS MOUNTED ON STEEL BRACKETS THAT SIT ON A THICK CONCRETE BLOCK.
- LARGE TEMPERATURE READER (FOR INSIDE AND OUTSIDE OF "BEARING") MOUNTED ON WALL.
- LARGE POWER SHUT-OFF ~~STEEL~~ LEVER.



JH

7/15/11 BLACK PINE MINE

LEWIS SHAFT (HISTORIC MINE AREA)

BUILDING #2 (OUTSIDE)

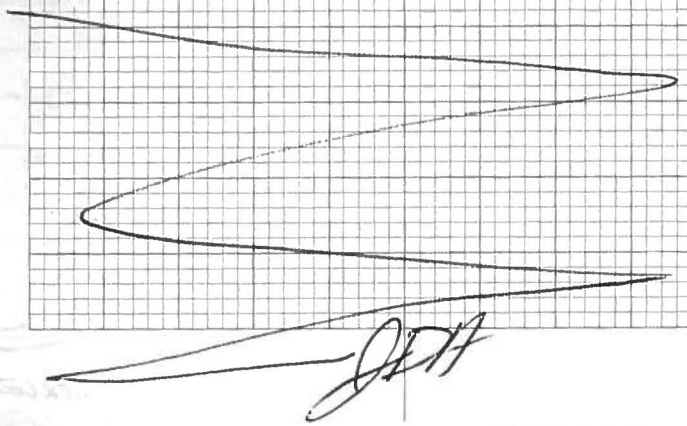
PHOTOS # 100-0079 → 100-0082

- CORRUGATED METAL SIDING & ROOF, BUILT ON HORIZONTAL 6x6 POSTS WITH CONCRETE LOAD BEARING POINTS
- WESTERN SIDE OF BUILDING (100-0082) HAS A BROKEN WINDOW, A BOARDED UP WINDOW, A HOLE IN THE SIDE (SHELVES SEEN INSIDE), AND A RED DOOR.

DIMENSIONS:

54 FT LONG, 20 FT WIDE, 8 FT TO 18 FT ROOF (EDGE TO PEAK)

- PULLY RUNNING FROM TALL RED FRAME STRUCTURE (STEEL) INTO NORTHWESTERN SIDE OF THE BUILDING.
- WOODEN "DECK" OUT FRONT



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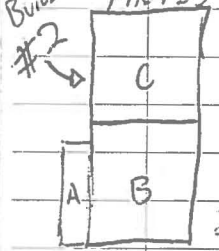
7/15/11 BLACK PINE MINE

LEWIS SHAFT (HISTORIC MINE AREA)

BUILDING #2 (INSIDE)

PHOTOS # 100-0083 → 100-0095



2-A: ENTRY AREA, WOODEN FLOOR BOARDS, WOODEN BENCH, CROW BAR, LOTS OF RODENT DROPPINGS.

2-B: RODENT DROPPINGS, BROKEN GLASS, TWO WOODEN BENCHES, WOOD BURNING STOVE, STRAW BROOM.

- 3 FT TALL WOOD FENCE BUILT INSIDE AROUND MAIN PULLEY CRANK SYSTEM
- ELECTRICAL BOXES (SIX) MOUNTED ON NORTHWESTERN WALL.
- METAL BOX WITH METAL BRACKETS ON FLOOR
- CALENDAR FROM 1981 ON WALL

2-C: RODENT DROPPINGS, FOXES WITH ROCK DRILL CORES SPILLED ON GROUND AND STACKED ON A WALL OF SHELVES.

- LARGE STEEL UNIT HOUSED IN 2-C, FLOOR TO CEILING HEIGHT INCREASES FROM 10 FT (2-A, 2-B) TO 20 FT
- SOME OLD WOOD LADDERS AND VARIOUS METAL POLES (10 FT LONG).
- RED DOOR ON OUTSIDE LOCKED WITH HEAVY DUTY MASTER LOCK.

7/15/11 BLACK PINE MINE

LEWIS SHAFT (HISTORIC MINE AREA)

CONVEYOR DRIVE UNIT

DIMENSIONS: 24 FT LONG, 5 FT WIDE, 7 FT TALL

PHOTO 100-0096

BUILDING #4 (OUTSIDE)

PHOTO #'S 100-0097 → 100-0099

- DIMENSIONS: 30 FT ~~all~~ WIDE, 60 FT LONG, 14 FT TO 12 FT (PEAK TO EDGE)
- METAL SIDING AND ROOF (FIBERGLASS PATCHES.
- LARGE GARAGE DOOR ON NORTHEASTERN SIDE (ALL THREE WINDOWS BROKEN)
- ALL WINDOWS ON BUILDING BROKEN,
- LOTS OF DENTS IN SIDING AT FRONT, REST OF BUILDING LOOKS GOOD.
- DOOR IS OPEN, NO LOCK OR WAY TO PUT LOCK ON.
- GARAGE DOOR EXTREMELY WEATHERED (WOOD)

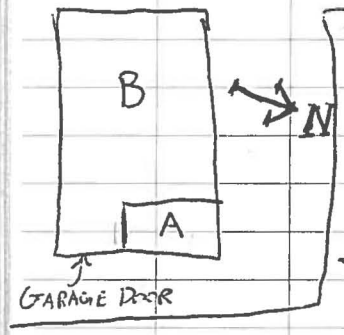
JDH

7/15/11 Black Pine Mine

Lewis Shaft (Historic Mine Area)

Building #4 (inside)

Photo #'s 100-0100 → 100-0108



2-A: Work bench/shelving on two walls,

- 3 capped 5 gallon buckets (appear relatively new).
- Bags of crushed rock on ground
- Electrical circuit boards all over (greater than 30) in 8.5 x 11 inch envelopes.
- Boxes and some steel pipe (4 inch O.D.) on the ground
- Some ceiling insulation missing, most still hanging.

2-B

- Lots of shelving full of rock cores.
- Pile of rocks (cores) and boxes on ground
- Large blue fan/blower
- Unopened photometric sorter (control panel and unit)
- Small blue/white drum with unknown substance
- Card board sheets and boxes
- Control panel for conveyor
- Conveyor belt (extra or used)
- Metal attachments to conveyor unit

7/15/11 Black Pine Mine

Comminution Mill

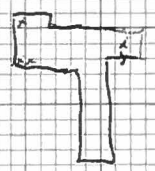
Photo #'s 100-1142 → 100-1164

Masonry foundation
- ~42' long
- 15' high
- 3' thick

Metal Debris
rusted gears and pulleys from conveyer system, containers, pipes

Wood Debris
Varied dimensional, structural timbers
15' x 15' post

Concrete mounting blocks on East end



Anchor bolts 1½ diameter protruding from blocks, approx 10-15 ft long

Wood pile (w/ metal) (structural) to West

Various metal debris scattered throughout forest

Wooden structure North of Mill, rusted metal cylinders

7/15/11 Black Rock Mine

Photo #'s 100-1165

Former Assay House

Concrete

4 x 8 pool, bricks on top

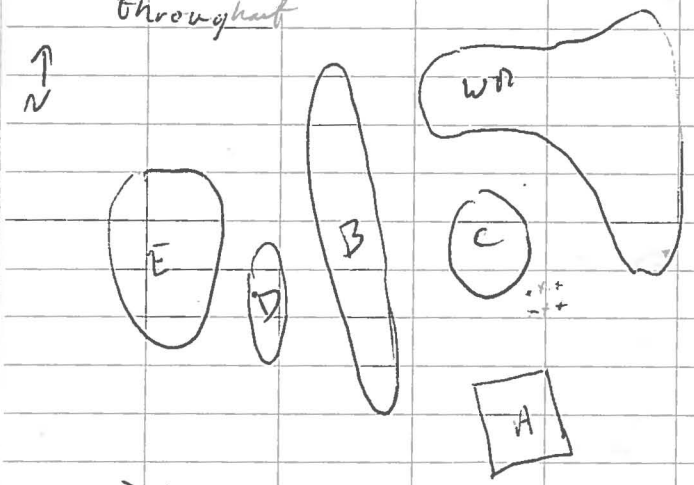
Bricks scattered throughout area

Various metal debris scattered throughout area

Old Mill site

A) Masonry & brick furnace / roaster

B) Concrete & masonry debris, metal bolts & structural throughout



C) Various sized tailings

cont

7/15/11

Old Mill continued

Photo #'s 100-1164 → 100-1188

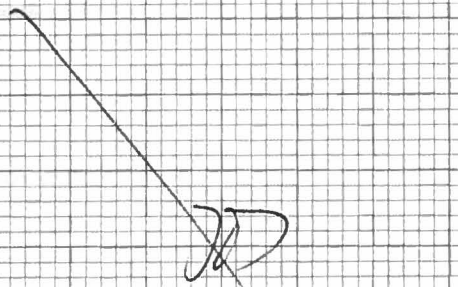
Bricks scattered throughout site

Various metal debris throughout

x 1 inch bolts protruding from ground

D) Timber debris

E) Waste rock / tailings

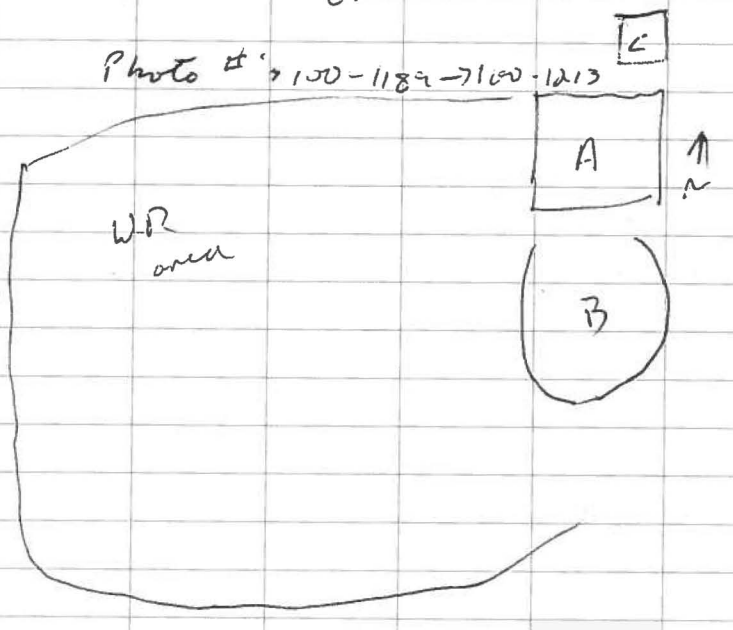


cont

7/15/11 Black Pine Mine

Harrison Shaft

Photo #'s 1100-1184 → 1100-1213



A) Crumbling, cobble and concrete (masonry) structure, remnants of Concrete block on top 1 inch metal bolts protruding

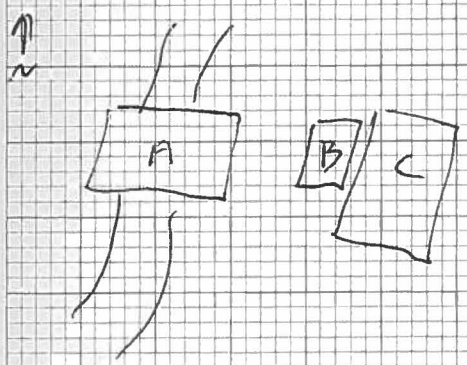
B) Mine shaft, sinking

C) Concrete foundation w/ connecting bolts (1 min) 10' x 10'

7/15/11 Black Pine Mine

Harper Shaft

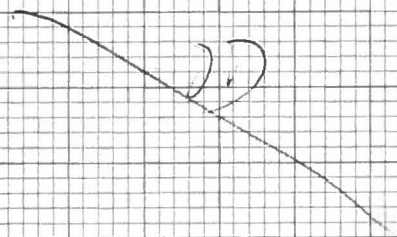
Photo #'s 1100-1314 → 1100-1230



A) concrete pad 24' x 27'

B) Red exhaust fan

C) Belt housing for fan
Concrete block for motor
4' x 4' x 3'
Plate metal to hold motor
Building made of wood, tin roof



7/15/11 Black Pine Mine

Combination #1 Adit

Photo #'s 100-1231 → 100-1233

3 piles of rocks
no distinguishing features

Beauvenetra Adit

Photo #'s 100-1234 → 100-1235

Depression, waste rock
some vegetation and tree growth

Combination #2 Adit

Photo # 100-1236

Cut on hillside

Culvert under road

Tree growth, some veg

Combination Mine Auxiliary Adit

Photo #'s 100-1237 → 100-1238 1239

Entrance boarded up, door locked

Timber rots collapsed

6/13/11 Beuck Pine Mine
0700 Met at Herrera office. Will pick up supplies and head to site.

0900 Arrived at site.
Luke - Trihydro
James
Alex
Kevin
Gina
} Herrera
Toured site.
Met with DEQ (Dawn and intern). Toured Mill site and historic area.
Will collect Tim Smith and historic area sites today.
KH + DEQ left site.
Broke into 2 teams for sampling.

6/13/11 Beaver Pine Mine

1500 Arrived at TSP-3.
GPS points stored for TSP-3 approx 15' south of channel.
GPS point TSP-3 taken from N. edge of creek.

Flow:

Dist. (ft)	Depth (ft)	Velocity (fps)
1.4	ø	ø
1.7	0.60	0.02
2.0	0.60	3.25
2.3	0.55	3.93
2.6	0.60	3.69
2.9	0.45	2.91
3.2	0.50	1.81
3.5	0.60	1.56
3.8	0.50	1.91
4.1	0.50	2.35
4.4	0.45	2.47
4.7	0.45	1.95
5.0	0.50	1.33
5.3	0.30	0.55
5.6	0.15	0.55
5.9	ø	ø

Beaver Pine Mine 6/13/11

Water Quality

temp = 8.8°C
cond = 30 µs/cm²
DO = 85.4 % 9.93 mg/L
pH = 7.30

Collected water sample TSP-3 @ 15:30

Collected sediment sample BP-TS-SD-02-60 @ 1540.

greenish brown gravel with silt and sand.

Trib. above TSP-3 approx 3X flow of TS drainage.

1630 Arrived at TSP-8.

Water Quality:
temp = 11.39 °C
cond = 35 µs/cm²
DO = 76.2% 8.35 mg/L
pH = 7.23

6/13/11 Black Pine Mine

Dist (ft)	Depth (ft)	Velocity (fps)
2.7	Ø	Ø
3.0	0.30	0.66
3.3	0.30	1.75
3.6	0.30	1.31
3.9	0.35	1.11
4.2	0.35	0.87
4.5	0.35	1.16
4.8	0.20	0.059
5.1	0.15	Ø
5.4	Ø	Ø

1645 Collected water sample TSP-8.

1655 - COLLECTED SEDIMENT SAMPLE @ BP-TS-SD-01-00
- SEDIMENT BROWN SILTY COARSE SAND WITH ORGANIC MATERIAL AND A MINOR BIOSHEEN
- GRAVEL, WOOD, AND VEGETATION OBSERVED IN SEDIMENT
- SEDIMENT SAMPLED TO 3" IN DEPTH, TOO ROCKY/HARD BELOW TO REACH 3-6" DEPTH

Black Pine Mine 6/13/11

1725 Location TSP-9
18" outfall.
CMP culvert
0.19' deep
3.75 fps

1730 Collected water sample TSP-9.

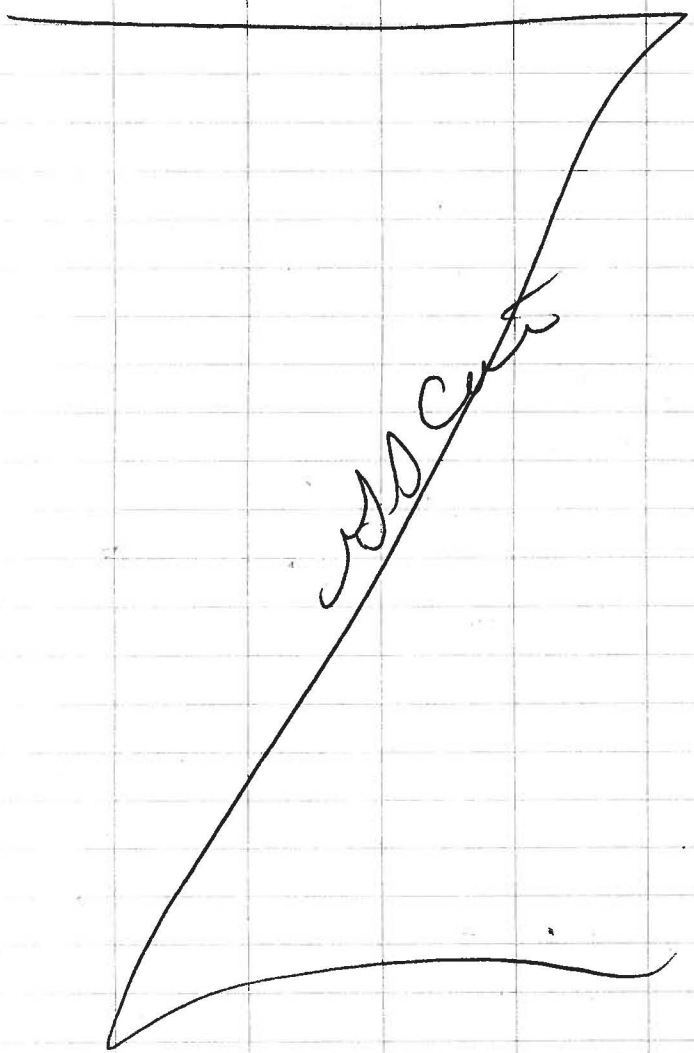
temp 10.9°C
cond 34 µs/cm²
DO = 82.9% ; 9.15 mg/L
pH = 6.65

1745 Collected Field blank for Mercury. "FIELD BLANK 1"

1800 Left for Comb Mine to check outfall.
Very little water noted.
Not enough to sample.
Called KH - We will check in morning.

6/13/11 Black Pine Mine

1845 Left site.



6/14/11 Black Pine Mine

0900 Arrived on site. LD + James heading to Outfalls at Comb. Mine. GC/AS to Comb. Mill to perform salt test. Outfall #1 + 3, some water, but no flow.

0950 FS on-site.

Salt slug injection:

Starting point - bridge crossing creek.

Added 5 lbs of salt to 3 gallons of stream water.

Will measure out distance of ~100 m.

Creek width 3-5 in.

end point: 406' downstream

Dumped @ 10:08

peak - 65 µs/cm @ 10:13

time = 5 min

80' per min

6/14/11 Black Pine Mine

Bob – regional office

Sonny – OSC for project

Safety concern: shaft opening.

sediment: bed load sampling desired

Note from Bob:

pump house on Cries Mill – may have been pumped from Tim Smith underground.

Comb. Mine – road drainage to N of site –

near historic site CPS-3.

– reclaimed area near ponds

Black Pine Mine 6/14/11

1345 arrived at TSP-6

1350 collected water sample TSP-6.

1355 Collected sediment sample BP-TS-SD-03-00.

Brown sandy silt w/ organic matter. Veg.

WQ Parameters

temp = 10.2°C

cond = 31 µs/cm²

DO = 89% ; 9.99 mg/L

pH = 7.48

Dist (ft)	Depth (ft)	Vel (fps)
1.9	Ø	Ø
2.2	0.32	1.46
2.5	0.35	1.97
2.8	0.53	2.10
3.1	0.73	1.85
3.4	0.75	1.75
3.7	0.80	1.55
4.0	0.83	1.45
4.3	0.80	1.73
4.6	0.78	2.00
4.9	0.80	1.74
5.2	0.65	1.74
5.5	0.50	1.69
5.8	0.50	1.37
6.1	0.40	0.71
6.4	0.40	0.38
6.7	0.40	0.33
7.0	0.35	0.12
7.3	0.25	Ø
7.6	0.25	Ø
7.9	0.25	Ø
8.2	Ø	Ø
~~8.5~~		

6/14/11 Beach Pre Mine

1420 Arrived at CML-SW-05

1425 Collected sediment sample BP-CML-SD-05-00 from side channel; no deposits in creek.

brown silty gravel.

DIST (ft)	DEPTH (ft)	VEL (fps)
2.0	Ø	Ø
2.5	0.10	Ø
3.0	0.15	Ø
3.5	0.20	Ø
4.0	0.25	Ø
~~4.5~~	0.25	~~0.10~~ 0.01
5.0	0.10	0.02
5.5	0.50	0.14
6.0	0.70	1.37
6.5	0.65	3.20
7.0	0.65	2.52
7.5	0.92	3.24
8.0	1.10	3.12
8.5	~~0.85~~ 1.05	~~2.72~~
9.0	1.05	3.52
9.5	1.05	4.87
10.0	1.40	5.40
10.5	1.20	5.14
11.0	1.45	5.27
11.5	1.35	6.35
12.0	1.25	5.89
12.5	1.25	4.70
13.0	1.00	4.87
13.5	0.80	3.69
14.0	Ø	Ø

6/14/11 Black Pine Mine

1451 Arrived at location SW-13.
Moved location downstream approximately ~~50~~ 40 additional feet from TS drainage because water entering L. Willow Creek was not completely mixed.

~~Depth~~

Dist (ft)	Depth (ft)	Vel (fps)
1.0	∅	∅
1.5	∅	∅
2.0	0.70	1.70
2.5	0.85	1.80
3.0	1.15	1.58
3.5	1.20	2.64
4.0	1.15	3.40
4.5	1.22	3.19
5.0	1.45	3.03
5.5	1.43	3.58
6.0	1.55	4.14
6.5	1.45	4.16
7.0	1.50	4.23
7.5	1.25	4.50
8.0	1.25	3.70
8.5	1.25	3.36
9.0	1.15	3.32
9.5	1.15	3.33
10.0	1.25	3.26
10.5	1.20	2.66
11.0	1.15	2.50
11.5	0.85	2.62
12.0	0.75	2.48
12.5	0.63	2.42
13.0	0.65	1.58
13.5	0.35	0.16
~~14.0~~		
13.7	∅	∅

Black Pine Mine 6/14/11

1555 Arrived at GWL-SW-19

Dist (ft)	Depth (ft)	Velocity (fps)
0	∅	∅
1	0.05	∅
2	0.10	∅
3	0.15	∅
4	0.23	0.76
5	0.55	1.67
6	0.60	2.25
7	0.55	2.04
8	0.65	2.61
9	0.83	2.91
10	0.90	3.50
11	1.07	4.08
12	1.05	4.60
13	1.10	4.65
14	0.95	6.06
15	1.22	5.14
16	1.10	3.80
17	0.90	2.01
18	0.40	1.30
19	0.10	0.15
~~20~~		
19.8	∅	∅

6/14/11 Black Pine Mine

1625 Arrived at SW-4

1630 Collected sediment sample BP-CML-SD-~~05~~-00 4 gr

Dist. ~~Depth~~ (ft)	Depth (ft)	Velocity (fps)
2	Ø	Ø
3	1.20	2.85
4	0.84	3.70
5	1.05	4.65
6	1.00	5.10
7	0.95	4.27
8	1.05	4.62
9	0.80	3.09
10	0.55	5.12
11	0.60 gr	4.54
12	0.52	3.34
13	0.75	3.59
14	1.00	2.73
15	1.10	2.00
16	0.45	2.90
17	0.75	1.01
18	0.50	1.44
19	0.25	0.97
20	Ø	Ø

Taken ~ 8' downstream of bridge

Black Pine Mine 6/14/11

1724 Arrived at CML-SW-4.

DIST (ft)	DEPTH (ft)	VEL (fps)
~~2~~	Ø	Ø
3	0.90	2.83
4	0.92	2.62
5	0.85	3.57
6	0.70	4.28
7	1.10	4.60
8	1.00	4.70
9	1.00	4.40
10	1.00	3.86
11	0.95	3.51
12	0.90	3.04
13	0.80	3.32
14	0.80	2.80
15	0.75	2.76
16	0.70	2.28
17	0.70	2.11
18	0.65	0.58
19	0.45	Ø
gr ~~20~~ 19.7	Ø	Ø

6/14/11 Black Pine Mine

1745 Arrived at CML-SW-15.

GPS point

Dist. (ft)	Depth (ft)	Vel (fps)
2	ø	ø
3	0.15	1.16
4	0.80	3.56
5	0.70	4.34
6	0.42	6.09
7	0.25	2.94
8	0.10	3.97
9	0.22	2.36
10	0.25	3.30
11	0.25	2.34
12	0.33	3.23
13	0.35	3.29
14	0.63	2.27
15	0.78	3.24
16	0.80	3.51
17	0.80	~~3.51~~ 3.85 gm
18	1.05	3.71
19	1.25	4.40
20	1.25	4.39
21	1.25	4.94
22	1.05	4.83
23	1.15	2.90
24	0.60	1.49
25	ø	ø

Black Pine Mine 6/14/11

1825 Arrived at CML-SW-03.
Will collect water/sed samples tomorrow.

Dist (ft)	Depth (ft)	Velocity (fps)
~~3.9~~ 4.2	ø	ø
~~4.2~~ 4.5	0.25	1.48
~~4.5~~ 4.8	0.33	1.43
~~4.8~~ 5.1	0.45	2.85
~~5.1~~ 5.4	0.50	2.88
~~5.4~~ 5.7	0.25	3.14
~~5.7~~ 6.0	0.10	1.99
6.0 6.3	0.05	0.48
~~6.3~~ 6.6	0.20	0.50
~~6.6~~ 6.9	0.50	1.04
6.9 7.2	0.60	1.24
~~7.2~~ 7.5	0.55	1.97
~~7.5~~ 7.8	0.50	2.76
~~7.8~~ 8.1	0.40	0.88
~~8.1~~ 8.4	0.40	1.05
~~8.4~~ 8.7	ø	ø

1830 gm Observed drainage at mine area - not being collected in correct ditch. Took photos and notified KH.

1945 Left site.

BB

6/15/11 Black Pine Mine

0745 Arrived onsite.
Water level at bridge at mark left yesterday (w/in ~~+2~~ 1 cm)

Held daily tailgate.
JJ/LD will sample locations SW-2 + SW-16.
GC/AS will start at Mill gulch and then complete COCs + pack coolers.

0820 Collected water sample BP-CML-SW-03.
0825 Collected sediment sample BP-CML-SD-03-00.
light brown clayey gravel. very limited amounts, stream is rocks with veg. mat. Sediment found near edge of stream.

Black Pine Mine 6/15/11

Water Quality

Temp = 5.5°C
cond = 39 us/cm
DO = 84.5% ; 10.65 mg/L
pH = 7.06

1050 FINISHED CALIBRATING YSI 556 MULTI-METER, CALIBRATED PH USING 7 + 10 BUFFERS; METER READS 7 BUFFER @ 7.02
CHECKED CONDUCTIVITY, 84 µS/cm STD = 84 µS/cm - OK
CALIBRATED DO @ 100% SATURATION USING LOCAL BAROMETRIC PRESSURE

Synoptic sampling will start at ~~12:39~~ 1235.

AS/JJ Team 1
GC/LD Team 2

1239 Sample CML-SW-13
WQ Parameters
temp 6.40°C
cnd. 0.020 mS/cm
DO 71.7%, 8.84 mg/L
pH 6.83

6/15/11 Black Pine Mine
1320 Sample CML-SW-04

Water Quality
temp: 6.68°C
cond: 0.023 ms/cm
DO: 71.7% ; 8.77 mg/L
pH: 6.63

1335 Sample CML-SW-15
Field dup QC-2 @ 1339

water Quality

temp: 7.36°C
cond: 0.025 ms/cm
DO: 72.2% ; 8.69 mg/L
pH: 6.69

trib entering creek from the west just above SW-16

Black Pine Mine 6/15/11

1409 Collected sample CML-SW-16

Water Quality
temp = 7.86°C
Cond = 0.024 ms/cm
DO = 71.2% ; 8.46 mg/L
pH = 6.61

1451 collected sample CML-SW-10

Water Quality
temp 7.49°C
Cond 0.024 ms/cm
DO 71.3 % ; 8.55 mg/L
pH 6.49

1520 Collected sample CML-SW-08.

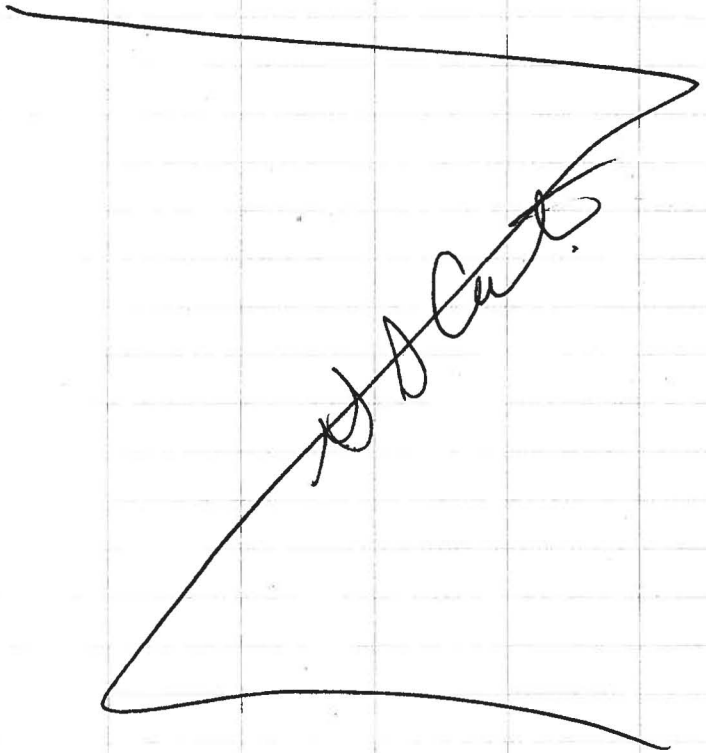
Water Quality
temp 7.40°C
Cond 0.025 ms/cm
DO 70.9% ; 8.53 mg/L
pH 6.54

6/15/11 Black Pine Mine

1530 Collected 11 Hg sample for CML-SW-18.

1620 Arrived back at vehicles.

1730 Left site.



6/16/11 Black Pine Mine

0815 GC/AS arrived at site.
0915 Arrived at N part of tailings impoundment near SW-09.
Sample collected from center of stream (exposed to air)
1" brown sand w/ silt orangish thin layer on surface. no odor.
0920 Collected sample CML-SD-13-00
0925 Arrived at next location - SE part of impoundment, near access road. Sediment collected in slough connected with location SD-13.
0930 Collected sediment sample CML-SD-13-00.
orangish brown silty fine to med sand.
Collected along edge of stream.

0950 Arrived at tailings Impoundment south of CML-SW-10.
Bank cut 6-7' along east side.
0955 Sample CML-SD-15-00 collected from slough/tailings at creek.
0-4" H tan ~~clay~~ silty clay. "Peanut butter-like" consistancy. no odor.
1025 Arrived at location ~150-200' upstream of CML-SW-11.
1030 Collected sediment CML-SD-16-00
H brown silty sand.
DK brown thin layer on surface (maybe organic)
1040 Collected sediment sample CML-SD-17-00
Side channel upstream of CML-SW-02.
H. orangish brown sand w/

silt. some organic matter (grass, wood, veg).
1055 Back at Vehicle. Will complete COCs and pack samples for shipment.
1230 Left site. Will drop-off samples in Missoula for FedEx delivery.
1430 Delivered samples

Black Pine Mine 8-16-11

800 - organize supplies, unpack equipment calibrate meters

1000 - Meet Boland Drilling - Chris & Steve at Sunshine station, head to site.

1040 - Arrive @ Repository location BP-RY-SB-06, located in central portion of repository. H&S meeting

1100 Begin drilling at this location. Drillers will use 2' split spoon sampler (3") for continuous sampling. Waste rock scattered throughout surface soils in this area.

1345 - drill rig breaks down @ 26' bgs. radiator potentially overheated. Will need to let it cool down to assess damages.

1420 - no hoses damaged, appears radiator overheated. Added Radiator fluid, started drill, everything appears to be functioning normal

1520 - drill rig overheated @ 28' will wait to attempt 28' to 30' sample.

@ 30' END OF BORING, TIGHT FORMATION

BP-RY-SB-06 8-16-11

PREVENTS ADVANCING TO DEEPER DEPTHS. CONTINUES TO OVERHEAT.

1545 - Complete boring BP-RY-06. Begin to complete as monitoring well. Confirm .010 slot & 10/20 filter pack sand. well will be set @ 13' & screened from 3'-13' bgs. see logs for completion details bgs, location

1700 - Monitoring well @ BP-RY-06 set & completed. no water present. Pack up equipment head back to hotel BH to location BP-RY-07, downgradient from Repository. Decon augers

1730 - Drillers offsite. BH & KH visit Tim Smith Buildings for asbestos survey. metal, wood glass & aluminum frame windows present no samples for asbestos collected,

1750 - BH & KH visit Lewis Shaft for Asbestos survey. 3 samples of fiberglass insulation

BPM 8-16-11

Silver coated backing paper collected 2 from N building & 1 from S building. Samples will be called:

BP-PACM-01 → N Bldg
BP-PACM-02 → N Bldg
BP-PACM-03 → S Bldg

only additional material that is suspect is roof patching material @ vent on S. building.

1815 - leave site for Hotel.
1845 - End of Day

Sample names changed to:

BP-HM-ASB-01 → N
BP-HM-ASB-02 → N
BP-HM-ASB-03 → S

Black Pine Mine 8-17-11

700 - leave for site.
730 - Arrive onsite w/ Boland Drilling, Chris & Steve.
- HAVE HEALTH & SAFETY MEETING
800 - Begin drilling boring BP-RY-07 located at toe of repository to NW, 15' N of overhead Power lines.
815 - collect soil sample BP-RY-07-00 surface layer.
850 - collect soil sample BP-RY-07-10 from clayey gravelly SILT layer.
955 - Drill Rig overheats at 22' bgs. formation too tight to continue augering. Will collect 2 more split spoons to 26' bgs & set monitoring well from 5' bgs to 13' bgs. Screen for 3-13' bgs.
1130 - complete MW install @ BP-RY-07.
- move to location BP-RY-08.
- Decon augers
1200 - Begin drilling @ location BP-RY-08.
1210 - collect surface soil sample BP-RY-08-00.
- collect enough soil for agricultural testing.
1236 - collect Geotech Sample from 8 to 10 feet. 1' layer of silty gravel w large chunks on bedrock assumed schist. Refusal @ 10'.

8/17/11 continued.

~~Kevin collected destructive samp~~ KTH

1245 - confirm refusal - will set well @ 10' screen from 3-10' bgs.

1415 - complete well install @ BP-RY-08. Drillers decon auger & pack up.

1430 - Drillers leave site. BH waits for Pace Pick up.

1518 - BH checks Total well depths & DTW if ~~applicable~~ BH present.

~~BP-RY-06 BH~~

well	TD	DTW
BP-RY-06	15.91'	DRY
BP-RY-07	16.01'	DRY
BP-RY-08	12.91'	DRY

1600 - BH leaves site.

1630 - end of day

8-17-11

8/17/11 continued

KEVIN COLLECTED 4 destructive Sample for RCRA down at Combination Mill AOC. Collected 1 brick and 1 wood sample at the historic mill and 1 brick and 1 wood at the Mills located east of SF Lower Willow Creek. Labeled them BP-CM-RCRA-01-04. see Kevin's notebook for more detailed notes.

8.17.11

APPENDIX M

PHOTO LOG

APPENDIX M. PHOTO LOG - RECLAMATION INVESTIGATION

BLACK PINE MINE

Photo Key: 1 	Photo Key: 2
Date: 6/22/2011	Date: 6/22/2011
Photo Key: 3 	Photo Key: 4
BPM surface water/sediment sampling 06-12-11 through 06-15-11	BPM surface water/sediment sampling 06-12-11 through 06-15-11
Date: 6/22/2011	Date: 6/22/2011

APPENDIX M. PHOTO LOG - RECLAMATION INVESTIGATION

BLACK PINE MINE

Photo Key: 5	Photo Key: 6
BPM surface water/sediment sampling 06-12-11 through 06-15-11	BPM surface water/sediment sampling 06-12-11 through 06-15-11
Date: 6/22/2011	Date: 6/22/2011
Photo Key: 7	Photo Key: 8
BPM surface water/sediment sampling 06-12-11 through 06-15-11	BPM surface water/sediment sampling 06-12-11 through 06-15-11
Date: 6/22/2011	Date: 6/22/2011

APPENDIX M. PHOTO LOG - RECLAMATION INVESTIGATION

BLACK PINE MINE

Photo Key: 9	Photo Key: 10
BPM surface water/sediment sampling 06-12-11 through 06-15-11	BPM surface water/sediment sampling 06-12-11 through 06-15-11
Date: 6/22/2011	Date: 6/22/2011
Photo Key: 11	Photo Key: 12
BPM surface water/sediment sampling 06-12-11 through 06-15-11	BPM surface water/sediment sampling 06-12-11 through 06-15-11
Date: 6/22/2011	Date: 6/22/2011

APPENDIX M. PHOTO LOG - RECLAMATION INVESTIGATION

BLACK PINE MINE

Photo Key: 13	Photo Key: 14
BPM surface water/sediment sampling 06-12-11 through 06-15-11	BPM surface water/sediment sampling 06-12-11 through 06-15-11
Date: 6/22/2011	Date: 6/22/2011
Photo Key: 15	Photo Key: 16
BPM surface water/sediment sampling 06-12-11 through 06-15-11	BPM surface water/sediment sampling 06-12-11 through 06-15-11
Date: 6/22/2011	Date: 6/22/2011

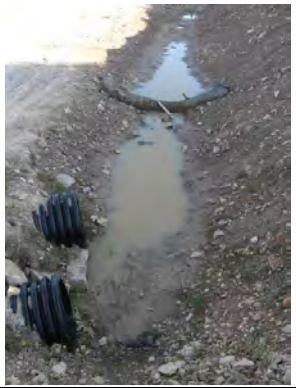
APPENDIX M. PHOTO LOG - RECLAMATION INVESTIGATION

BLACK PINE MINE

Photo Key: 17	Photo Key: 18
BPM surface water/sediment sampling 06-12-11 through 06-15-11	BPM surface water/sediment sampling 06-12-11 through 06-15-11
Date: 6/22/2011	Date: 6/22/2011
Photo Key: 19	Photo Key: 20
BPM surface water/sediment sampling 06-12-11 through 06-15-11	BPM surface water/sediment sampling 06-12-11 through 06-15-11
Date: 6/22/2011	Date: 6/22/2011

APPENDIX M. PHOTO LOG - RECLAMATION INVESTIGATION

BLACK PINE MINE

Photo Key: 21	Photo Key: 22
BPM surface water/sediment sampling 06-12-11 through 06-15-11	BPM surface water/sediment sampling 06-12-11 through 06-15-11
Date: 6/22/2011	Date: 6/22/2011
Photo Key: 23	Photo Key: 24 
BPM surface water/sediment sampling 06-12-11 through 06-15-11	BPM surface water/sediment sampling 06-12-11 through 06-15-11
Date: 6/22/2011	Date: 6/22/2011

APPENDIX M. PHOTO LOG - RECLAMATION INVESTIGATION

BLACK PINE MINE

Photo Key: 25	Photo Key: 26
BPM surface water/sediment sampling 06-12-11 through 06-15-11	BPM surface water/sediment sampling 06-12-11 through 06-15-11
Date: 6/22/2011	Date: 6/22/2011
Photo Key: 27	Photo Key: 28
BPM surface water/sediment sampling 06-12-11 through 06-15-11	BPM surface water/sediment sampling 06-12-11 through 06-15-11
Date: 6/22/2011	Date: 6/22/2011

APPENDIX M. PHOTO LOG - RECLAMATION INVESTIGATION

BLACK PINE MINE

Photo Key: 29	Photo Key: 30
BPM surface water/sediment sampling 06-12-11 through 06-15-11	BPM surface water/sediment sampling 06-12-11 through 06-15-11
Date: 6/22/2011	Date: 6/22/2011
Photo Key: 31	Photo Key: 32
BPM surface water/sediment sampling 06-12-11 through 06-15-11	BPM surface water/sediment sampling 06-12-11 through 06-15-11
Date: 6/22/2011	Date: 6/22/2011

APPENDIX M. PHOTO LOG - RECLAMATION INVESTIGATION

BLACK PINE MINE

Photo Key: 33	Photo Key: 34
BPM surface water/sediment sampling 06-12-11 through 06-15-11	BPM surface water/sediment sampling 06-12-11 through 06-15-11
Date: 6/22/2011	Date: 6/22/2011
Photo Key: 35	Photo Key: 36
BPM surface water/sediment sampling 06-12-11 through 06-15-11	BPM surface water/sediment sampling 06-12-11 through 06-15-11
Date: 6/22/2011	Date: 6/22/2011

APPENDIX M. PHOTO LOG - RECLAMATION INVESTIGATION

BLACK PINE MINE

Photo Key: 37	Photo Key: 38
BPM surface water/sediment sampling 06-12-11 through 06-15-11	BPM surface water/sediment sampling 06-12-11 through 06-15-11
Date: 6/22/2011	Date: 6/22/2011
Photo Key: 39	Photo Key: 40
BPM surface water/sediment sampling 06-12-11 through 06-15-11	BPM surface water/sediment sampling 06-12-11 through 06-15-11
Date: 6/22/2011	Date: 6/22/2011

APPENDIX M. PHOTO LOG - RECLAMATION INVESTIGATION

BLACK PINE MINE

Photo Key: 41	Photo Key: 42
BPM surface water/sediment sampling 06-12-11 through 06-15-11	BPM surface water/sediment sampling 06-12-11 through 06-15-11
Date: 6/22/2011	Date: 6/22/2011
Photo Key: 43	Photo Key: 44
BPM surface water/sediment sampling 06-12-11 through 06-15-11	BPM surface water/sediment sampling 06-12-11 through 06-15-11
Date: 6/22/2011	Date: 6/22/2011

APPENDIX M. PHOTO LOG - RECLAMATION INVESTIGATION

BLACK PINE MINE

Photo Key: 45	Photo Key: 46
BPM surface water/sediment sampling 06-12-11 through 06-15-11	BPM surface water/sediment sampling 06-12-11 through 06-15-11
Date: 6/22/2011	Date: 6/22/2011
Photo Key: 47	Photo Key: 48
BPM surface water/sediment sampling 06-12-11 through 06-15-11	BPM surface water/sediment sampling 06-12-11 through 06-15-11
Date: 6/22/2011	Date: 6/22/2011

APPENDIX M. PHOTO LOG - RECLAMATION INVESTIGATION

BLACK PINE MINE

Photo Key: 50	Photo Key: 51
BPM surface water/sediment sampling 06-12-11 through 06-15-11	BPM surface water/sediment sampling 06-12-11 through 06-15-11
Date: 6/22/2011	Date: 6/22/2011
Photo Key: 52	Photo Key: 53
BPM surface water/sediment sampling 06-12-11 through 06-15-11	BPM surface water/sediment sampling 06-12-11 through 06-15-11
Date: 6/22/2011	Date: 6/22/2011

APPENDIX M. PHOTO LOG - RECLAMATION INVESTIGATION

BLACK PINE MINE

Photo Key: 54	Photo Key: 55
BPM surface water/sediment sampling 06-12-11 through 06-15-11	BPM surface water/sediment sampling 06-12-11 through 06-15-11
Date: 6/22/2011	Date: 6/22/2011
Photo Key: 56	Photo Key: 57
BPM surface water/sediment sampling 06-12-11 through 06-15-11	BPM surface water/sediment sampling 06-12-11 through 06-15-11
Date: 6/22/2011	Date: 6/22/2011

APPENDIX M. PHOTO LOG - RECLAMATION INVESTIGATION

BLACK PINE MINE

Photo Key: 58	Photo Key: 59
BPM surface water/sediment sampling 06-12-11 through 06-15-11	BPM surface water/sediment sampling 06-12-11 through 06-15-11
Date: 6/22/2011	Date: 6/22/2011
Photo Key: 60	Photo Key: 61
BPM surface water/sediment sampling 06-12-11 through 06-15-11	BPM surface water/sediment sampling 06-12-11 through 06-15-11
Date: 6/22/2011	Date: 6/22/2011

APPENDIX M. PHOTO LOG - RECLAMATION INVESTIGATION

BLACK PINE MINE

Photo Key: 62	Photo Key: 63
BPM surface water/sediment sampling 06-12-11 through 06-15-11	BPM surface water/sediment sampling 06-12-11 through 06-15-11
Date: 6/22/2011	Date: 6/22/2011
Photo Key: 64	Photo Key: 65
BPM surface water/sediment sampling 06-12-11 through 06-15-11	BPM surface water/sediment sampling 06-12-11 through 06-15-11
Date: 6/22/2011	Date: 6/22/2011

APPENDIX M. PHOTO LOG - RECLAMATION INVESTIGATION

BLACK PINE MINE

Photo Key: 66	Photo Key: 67
BPM surface water/sediment sampling 06-12-11 through 06-15-11	BPM surface water/sediment sampling 06-12-11 through 06-15-11
Date: 6/22/2011	Date: 6/22/2011
Photo Key: 68	Photo Key: 69
BPM surface water/sediment sampling 06-12-11 through 06-15-11	BPM surface water/sediment sampling 06-12-11 through 06-15-11
Date: 6/22/2011	Date: 6/22/2011

APPENDIX M. PHOTO LOG - RECLAMATION INVESTIGATION

BLACK PINE MINE

Photo Key: 70	Photo Key: 71
BPM surface water/sediment sampling 06-12-11 through 06-15-11	BPM surface water/sediment sampling 06-12-11 through 06-15-11
Date: 6/22/2011	Date: 6/22/2011
Photo Key: 72	Photo Key: 73
BPM surface water/sediment sampling 06-12-11 through 06-15-11	BPM surface water/sediment sampling 06-12-11 through 06-15-11
Date: 6/22/2011	Date: 6/22/2011

APPENDIX M. PHOTO LOG - RECLAMATION INVESTIGATION

BLACK PINE MINE

Photo Key: 74	Photo Key: 75
BPM surface water/sediment sampling 06-12-11 through 06-15-11	BPM surface water/sediment sampling 06-12-11 through 06-15-11
Date: 6/22/2011	Date: 6/22/2011
Photo Key: 76	Photo Key: 77
BPM surface water/sediment sampling 06-12-11 through 06-15-11	BPM surface water/sediment sampling 06-12-11 through 06-15-11
Date: 6/22/2011	Date: 6/22/2011

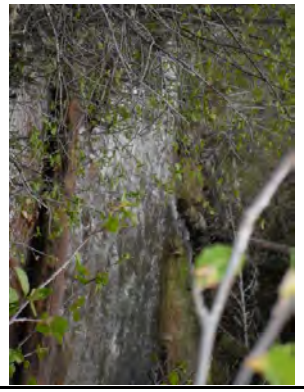
APPENDIX M. PHOTO LOG - RECLAMATION INVESTIGATION

BLACK PINE MINE

Photo Key: 78	Photo Key: 79
BPM surface water/sediment sampling 06-12-11 through 06-15-11	BPM surface water/sediment sampling 06-12-11 through 06-15-11
Date: 6/22/2011	Date: 6/22/2011
Photo Key: 80	Photo Key: 81
BPM surface water/sediment sampling 06-12-11 through 06-15-11	BPM surface water/sediment sampling 06-12-11 through 06-15-11
Date: 6/22/2011	Date: 6/22/2011

APPENDIX M. PHOTO LOG - RECLAMATION INVESTIGATION

BLACK PINE MINE

Photo Key: 82 	Photo Key: 83 
BPM surface water/sediment sampling 06-12-11 through 06-15-11	BPM surface water/sediment sampling 06-12-11 through 06-15-11
Date: 6/22/2011	Date: 6/22/2011
Photo Key: 84 	Photo Key: 85
BPM surface water/sediment sampling 06-12-11 through 06-15-11	BPM surface water/sediment sampling 06-12-11 through 06-15-11
Date: 6/22/2011	Date: 6/22/2011

APPENDIX M. PHOTO LOG - RECLAMATION INVESTIGATION

BLACK PINE MINE

Photo Key: 86 	Photo Key: 87
BPM surface water/sediment sampling 06-12-11 through 06-15-11	BPM surface water/sediment sampling 06-12-11 through 06-15-11
Date: 6/22/2011	Date: 6/22/2011
Photo Key: 88 	Photo Key: 89
BPM surface water/sediment sampling 06-12-11 through 06-15-11	BPM surface water/sediment sampling 06-12-11 through 06-15-11
Date: 6/22/2011	Date: 6/22/2011

APPENDIX M. PHOTO LOG - RECLAMATION INVESTIGATION

BLACK PINE MINE

Photo Key: 90	Photo Key: 91
BPM surface water/sediment sampling 06-12-11 through 06-15-11	BPM surface water/sediment sampling 06-12-11 through 06-15-11
Date: 6/22/2011	Date: 6/22/2011
Photo Key: 92	Photo Key: 93
BPM surface water/sediment sampling 06-12-11 through 06-15-11	BPM surface water/sediment sampling 06-12-11 through 06-15-11
Date: 6/22/2011	Date: 6/22/2011

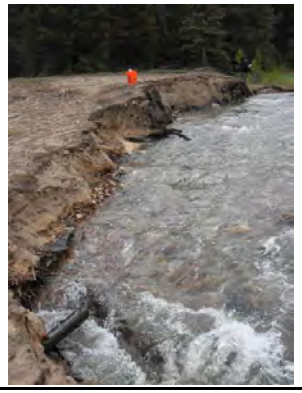
APPENDIX M. PHOTO LOG - RECLAMATION INVESTIGATION

BLACK PINE MINE

Photo Key: 94	Photo Key: 95
BPM surface water/sediment sampling 06-12-11 through 06-15-11	BPM surface water/sediment sampling 06-12-11 through 06-15-11
Date: 6/22/2011	Date: 6/22/2011
Photo Key: 96	Photo Key: 97
BPM surface water/sediment sampling 06-12-11 through 06-15-11	BPM surface water/sediment sampling 06-12-11 through 06-15-11
Date: 6/22/2011	Date: 6/22/2011

APPENDIX M. PHOTO LOG - RECLAMATION INVESTIGATION

BLACK PINE MINE

Photo Key: 98 	Photo Key: 99
BPM surface water/sediment sampling 06-12-11 through 06-15-11	BPM surface water/sediment sampling 06-12-11 through 06-15-11
Date: 6/22/2011	Date: 6/22/2011
Photo Key: 100	Photo Key: 101
BPM surface water/sediment sampling 06-12-11 through 06-15-11	BPM surface water/sediment sampling 06-12-11 through 06-15-11
Date: 6/22/2011	Date: 6/22/2011

APPENDIX M. PHOTO LOG - RECLAMATION INVESTIGATION

BLACK PINE MINE

Photo Key: 102	Photo Key: 103
BPM surface water/sediment sampling 06-12-11 through 06-15-11	BPM surface water/sediment sampling 06-12-11 through 06-15-11
Date: 6/22/2011	Date: 6/22/2011
Photo Key: 104	Photo Key: 105
BPM surface water/sediment sampling 06-12-11 through 06-15-11	BPM surface water/sediment sampling 06-12-11 through 06-15-11
Date: 6/22/2011	Date: 6/22/2011

APPENDIX M. PHOTO LOG - RECLAMATION INVESTIGATION

BLACK PINE MINE

Photo Key: 106	Photo Key: 107
BPM surface water/sediment sampling 06-12-11 through 06-15-11	BPM surface water/sediment sampling 06-12-11 through 06-15-11
Date: 6/22/2011	Date: 6/22/2011
Photo Key: 108	Photo Key: 109
Combination Mine Primary Adit	Combination Mine Primary Adit
Date: 7/15/2011	Date: 7/15/2011

APPENDIX M. PHOTO LOG - RECLAMATION INVESTIGATION

BLACK PINE MINE

Photo Key: 110	Photo Key: 111
Combination Mine Primary adit	Combination Mine Primary adit
Date: 7/15/2011	Date: 7/15/2011
Photo Key: 112	Photo Key: 113
Combination Mine Primary adit	Inside storage building at Lewis Shaft
Date: 7/15/2011	Date: 7/15/2011

APPENDIX M. PHOTO LOG - RECLAMATION INVESTIGATION

BLACK PINE MINE

Photo Key: 114 Inside storage building at Lewis Shaft Date: 7/15/2011	Photo Key: 115 Inside storage building at Lewis Shaft Date: 7/15/2011
Photo Key: 116 Inside storage building at Lewis Shaft Date: 7/15/2011	Photo Key: 117 Inside storage building at Lewis Shaft Date: 7/15/2011

APPENDIX M. PHOTO LOG - RECLAMATION INVESTIGATION

BLACK PINE MINE

Photo Key: 118 	Photo Key: 119
Inside storage building at Lewis Shaft	Inside storage building at Lewis Shaft
Date: 7/15/2011	Date: 7/15/2011
Photo Key: 120 	Photo Key: 121
Inside storage building at Lewis Shaft	Inside storage building at Lewis Shaft
Date: 7/15/2011	Date: 7/15/2011

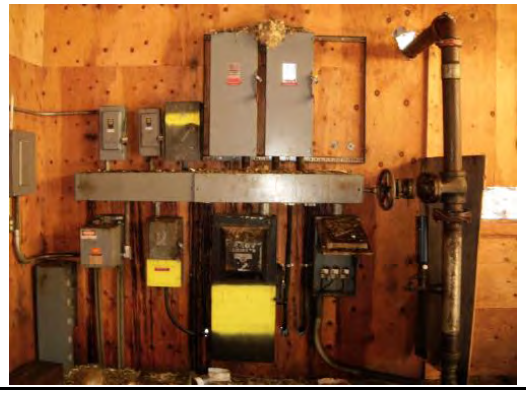
APPENDIX M. PHOTO LOG - RECLAMATION INVESTIGATION

BLACK PINE MINE

Photo Key: 122	Photo Key: 123
Building on Tim Smith pad	Building on Tim Smith pad
Date: 7/15/2011	Date: 7/15/2011
Photo Key: 124	Photo Key: 125
	Inside larger building at Tim Smith
Date: 7/15/2011	Date: 7/15/2011

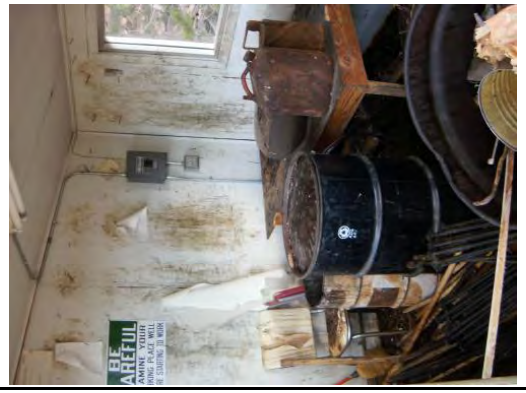
APPENDIX M. PHOTO LOG - RECLAMATION INVESTIGATION

BLACK PINE MINE

Photo Key: 126 	Photo Key: 127
Inside larger building at Tim Smith	Inside building at Tim Smith pad
Date: 7/15/2011	Date: 7/15/2011
Photo Key: 128	Photo Key: 129
Building on Tim Smith pad	Building on Tim Smith pad
Date: 7/15/2011	Date: 7/15/2011

APPENDIX M. PHOTO LOG - RECLAMATION INVESTIGATION

BLACK PINE MINE

Photo Key: 130	Photo Key: 131
Building on Tim Smith pad	Inside building on Tim Smith pad
Date: 7/15/2011	Date: 7/15/2011
Photo Key: 132 	Photo Key: 133
Inside building on Tim Smith pad	Inside building on Tim Smith pad
Date: 7/15/2011	Date: 7/15/2011

APPENDIX M. PHOTO LOG - RECLAMATION INVESTIGATION

BLACK PINE MINE

Photo Key: 134	Photo Key: 135
Inside building at Tim Smith pad	Inside storage building on Tim Smith pad
Date: 7/15/2011	Date: 7/15/2011
Photo Key: 136	Photo Key: 137
Inside storage building at Tim Smith pad	Tim Smith Adit No. 1
Date: 7/15/2011	Date: 7/15/2011

APPENDIX M. PHOTO LOG - RECLAMATION INVESTIGATION

BLACK PINE MINE

Photo Key: 138	Photo Key: 139
	Tim Smith pad
Date: 7/15/2011	Date: 7/15/2011
Photo Key: 140	Photo Key: 141
Tim Smith adit and "blower"	Fuel storage tank at Tim Smith
Date: 7/15/2011	Date: 7/15/2011

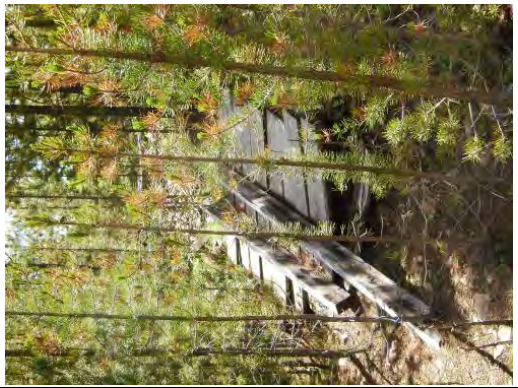
APPENDIX M. PHOTO LOG - RECLAMATION INVESTIGATION

BLACK PINE MINE

Photo Key: 142	Photo Key: 143
Fuel storage tank at Tim Smith	Tim Smith pad
Date: 7/15/2011	Date: 7/15/2011
Photo Key: 144	Photo Key: 145
Tim Smith waste rock	Tim Smith No. 2 Adite
Date: 7/15/2011	Date: 7/15/2011

APPENDIX M. PHOTO LOG - RECLAMATION INVESTIGATION

BLACK PINE MINE

Photo Key: 146	Photo Key: 147
Tim Smith No. 2 Adit dump	Tim Smith Adit No. 2
Date: 7/15/2011	Date: 7/15/2011
Photo Key: 148 	Photo Key: 149
Tim Smith Adit No. 2	Tim Smith Adit No. 2
Date: 7/15/2011	Date: 7/15/2011

APPENDIX M. PHOTO LOG - RECLAMATION INVESTIGATION

BLACK PINE MINE

Photo Key: 150	Photo Key: 151
Tim Smith Adit No. 2	Mine structure
Date: 7/15/2011	Date: 7/15/2011
Photo Key: 152	Photo Key: 153
Mine structure	Mine structure
Date: 7/15/2011	Date: 7/15/2011

APPENDIX M. PHOTO LOG - RECLAMATION INVESTIGATION

BLACK PINE MINE

Photo Key: 154	Photo Key: 155
Ventilation opening	Mine structure
Date: 7/15/2011	Date: 7/15/2011

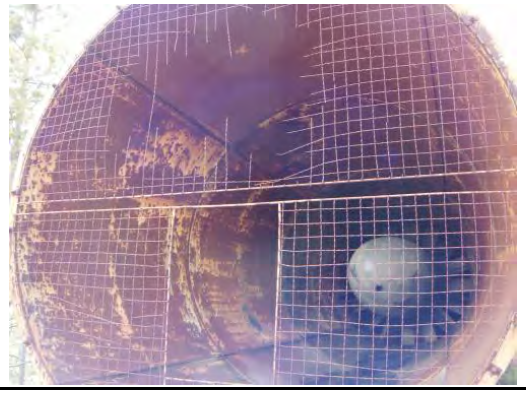
APPENDIX M. PHOTO LOG - RECLAMATION INVESTIGATION

BLACK PINE MINE

Photo Key: 156	Photo Key: 157
Mine Structure	
Date: 7/15/2011	Date: 7/15/2011
Photo Key: 158	Photo Key: 159
Date: 7/15/2011	Date: 7/15/2011

APPENDIX M. PHOTO LOG - RECLAMATION INVESTIGATION

BLACK PINE MINE

Photo Key: 160 	Photo Key: 161
Date: 7/15/2011	Date: 7/15/2011
Photo Key: 162 	Photo Key: 163
Entrance to Lewis Shaft	
Date: 7/15/2011	Date: 7/15/2011

APPENDIX M. PHOTO LOG - RECLAMATION INVESTIGATION

BLACK PINE MINE

Photo Key: 164

Date: 7/15/2011

Photo Key: 165

Date: 7/15/2011

Photo Key: 166

Date: 7/15/2011

Photo Key: 167

Date: 7/15/2011

APPENDIX M. PHOTO LOG - RECLAMATION INVESTIGATION

BLACK PINE MINE

Photo Key: 168	Photo Key: 169
	Inside pulley building
Date: 7/15/2011	Date: 7/15/2011
Photo Key: 170	Photo Key: 171
Pulley building	
Date: 7/15/2011	Date: 7/15/2011

APPENDIX M. PHOTO LOG - RECLAMATION INVESTIGATION

BLACK PINE MINE

Photo Key: 172	Photo Key: 173
Date: 7/15/2011	Date: 7/15/2011
Photo Key: 174	Photo Key: 175
Date: 7/15/2011	Date: 7/15/2011

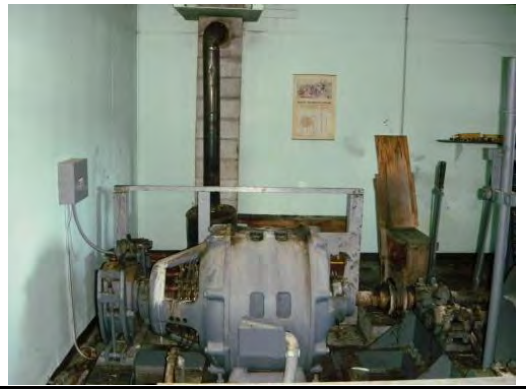
APPENDIX M. PHOTO LOG - RECLAMATION INVESTIGATION

BLACK PINE MINE

Photo Key: 176

Date: 7/15/2011

Photo Key: 177



Date: 7/15/2011

Photo Key: 178

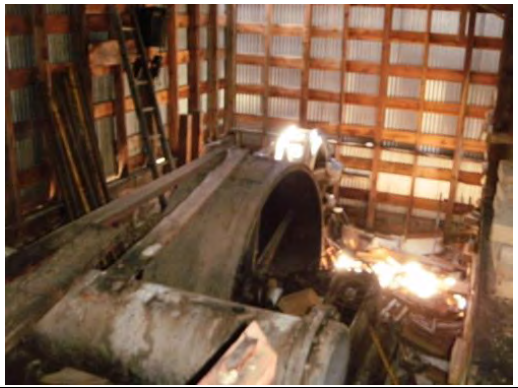
Date: 7/15/2011

Photo Key: 179

Date: 7/15/2011

APPENDIX M. PHOTO LOG - RECLAMATION INVESTIGATION

BLACK PINE MINE

Photo Key: 180	Photo Key: 181
Date: 7/15/2011	Date: 7/15/2011
Photo Key: 182 	Photo Key: 183
Date: 7/15/2011	Date: 7/15/2011

APPENDIX M. PHOTO LOG - RECLAMATION INVESTIGATION

BLACK PINE MINE

Photo Key: 184

Date: 7/15/2011

Photo Key: 185

Date: 7/15/2011

Photo Key: 191

Date: 7/15/2011

Photo Key: 192

Storage building near Lewis Shaft

Date: 7/15/2011

APPENDIX M. PHOTO LOG - RECLAMATION INVESTIGATION

BLACK PINE MINE

Photo Key: 193	Photo Key: 194
Storage building near Lewis Shaft	Pulley at Lewis Shaft
Date: 7/15/2011	Date: 7/15/2011
Photo Key: 195	Photo Key: 196
Storage building near Lewis Shaft	Conveyor drive unit
Date: 7/15/2011	Date: 7/15/2011

APPENDIX M. PHOTO LOG - RECLAMATION INVESTIGATION

BLACK PINE MINE

Photo Key: 200	Photo Key: 201
Utility path to pond from corridor north of waste rock dump.	CPS-1 and auxillary sumps and electrical vaults.
Date: 8/5/2011	Date: 8/5/2011
Photo Key: 202	Photo Key: 203
CPS-1 and auxillary sumps and electrical vaults.	CPS-1 and auxillary sumps and electrical vaults.
Date: 8/5/2011	Date: 8/5/2011

APPENDIX M. PHOTO LOG - RECLAMATION INVESTIGATION

BLACK PINE MINE

Photo Key: 204	Photo Key: 205
CPS-1 and auxillary sumps and electrical vault	Drain from waste rock dump entering pond.
Date: 8/5/2011	Date: 8/5/2011
Photo Key: 206	Photo Key: 207
Beginning of french drain near southernmost culvert.	Path of french drain along road.
Date: 8/5/2011	Date: 8/5/2011

APPENDIX M. PHOTO LOG - RECLAMATION INVESTIGATION

BLACK PINE MINE

Photo Key: 208	Photo Key: 209
Path of french drain along road.	Path of french drain entering pond area
Date: 8/5/2011	Date: 8/5/2011
Photo Key: 210	Photo Key: 211
Path of french drain entering pond	Path of french drain entering pond area.
Date: 8/5/2011	Date: 8/5/2011

APPENDIX M. PHOTO LOG - RECLAMATION INVESTIGATION

BLACK PINE MINE

Photo Key: 212 Lewis Shaft Date: 8/5/2011	Photo Key: 213 End of French Drain - entering pond - on east side of road below waste rock dump at Combination Mine. Date: 8/5/2011
Photo Key: 214 Lewis Shaft Date: 8/5/2011	Photo Key: 215 Looking down Lewis Shaft Date: 8/5/2011

APPENDIX M. PHOTO LOG - RECLAMATION INVESTIGATION

BLACK PINE MINE

Photo Key: 216	Photo Key: 217
Elevator at Lewis Shaft	Looking down the Lewis Shaft
Date: 8/5/2011	Date: 8/5/2011
Photo Key: 218	Photo Key: 219
Inside entrance to Lewis Shaft	Ventilation fan inside entrance to Lewis Shaft
Date: 8/5/2011	Date: 8/5/2011

APPENDIX M. PHOTO LOG - RECLAMATION INVESTIGATION

BLACK PINE MINE

Photo Key: 220

Entrance to Lewis Shaft

Date: 8/5/2011

Photo Key: 221

Staked utility line from manhole at toe of waste rock dump to pond

Date: 8/5/2011

Photo Key: 245

auxillary adit at Combination Mine

Date: 8/5/2011

Photo Key: 246

Utility corridor to auxillary adit at Combination Mine

Date: 8/5/2011

APPENDIX M. PHOTO LOG - RECLAMATION INVESTIGATION

BLACK PINE MINE

Photo Key: 254	Photo Key: 255
Utility corridor north of waste rock dump	Road Cut sample location
Date: 8/5/2011	Date: 5/19/2011
Photo Key: 256	Photo Key: 257
South Removal Area Drainage (SRAD). No water to sample	CPSW-2 sample location
Date: 5/19/2011	Date: 5/19/2011

APPENDIX M. PHOTO LOG - RECLAMATION INVESTIGATION

BLACK PINE MINE

Photo Key: 258	Photo Key: 259
CPSW-1 sample location	CPS-2 sample location
Date: 5/19/2011	Date: 5/19/2011
Photo Key: 260	Photo Key: 261
North Removal Area Drainage (NRAD). No water to sample	CPS-7A sample location
Date: 5/19/2011	Date: 5/19/2011

APPENDIX M. PHOTO LOG - RECLAMATION INVESTIGATION

BLACK PINE MINE

Photo Key: 262	Photo Key: 265
CPS-8 sample location	Road cut sample location
Date: 5/19/2011	Date: 5/19/2011
Photo Key: 266	Photo Key: 273
Inside CPS-1, overflow and electrical conduit	Well CMMW-4
Date: 5/5/2011	Date: 5/5/2011

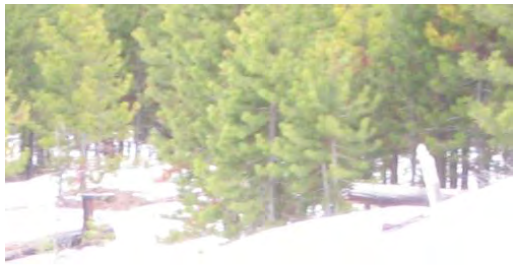
APPENDIX M. PHOTO LOG - RECLAMATION INVESTIGATION

BLACK PINE MINE

Photo Key: 298 	Photo Key: 299
Well CMMW-6, groundwater sample location	Well CMMW-1, groundwater sample location
Date: 5/5/2011	Date: 5/5/2011
Photo Key: 300 	Photo Key: 301
Wells CMMW-8 and CMMW-9, groundwater sample locations	Well CMMW-3, groundwater sample location
Date: 5/5/2011	Date: 5/5/2011

APPENDIX M. PHOTO LOG - RECLAMATION INVESTIGATION

BLACK PINE MINE

Photo Key: 302 	Photo Key: 303
well CMMW-4, groundwater sample location	CML-SW-08 sample location
Date: 5/5/2011	Date: 6/14/2011
Photo Key: 304	Photo Key: 305
CML-SW-10 sample location	CML-SW-12. No water at location
Date: 6/14/2011	Date: 6/13/2011

APPENDIX M. PHOTO LOG - RECLAMATION INVESTIGATION

BLACK PINE MINE

Photo Key: 306	Photo Key: 307
Site for CML-SW-12. No water at location	Site for CML-SW-12. No water at location
Date: 6/13/2011	Date: 6/13/2011
Photo Key: 308	Photo Key: 309
Former assay house site	Combination Mill
Date: 6/14/2011	Date: 6/14/2011

APPENDIX M. PHOTO LOG - RECLAMATION INVESTIGATION

BLACK PINE MINE

Photo Key: 310	Photo Key: 311
Combination Mill	Combination Mill
Date: 6/14/2011	Date: 6/14/2011
Photo Key: 312	Photo Key: 313
Combination Mill	Combination Mill impoundment area
Date: 6/14/2011	Date: 6/14/2011

APPENDIX M. PHOTO LOG - RECLAMATION INVESTIGATION

BLACK PINE MINE

Photo Key: 314

Combination Mill impoundment area

Date: 6/14/2011

Photo Key: 315

Combination Mill impoundment area. South pond

Date: 6/14/2011

Photo Key: 316

MCSP-1 sample location

Date: 6/13/2011

Photo Key: 317

Mill Gulch Creek. Taken from location of CML-SW-12 which has no water.

Date: 6/14/2011

APPENDIX M. PHOTO LOG - RECLAMATION INVESTIGATION

BLACK PINE MINE

Photo Key: 318	Photo Key: 319
CML-SW-08	Tributary near CML-SW-16
Date: 6/14/2011	Date: 6/14/2011
Photo Key: 320	Photo Key: 321
Tributary near CML-SW-16. Distinct color difference	CMN-SS-14
Date: 6/14/2011	Date: 7/14/2011

APPENDIX M. PHOTO LOG - RECLAMATION INVESTIGATION

BLACK PINE MINE

Photo Key: 322	Photo Key: 323
Staking location at RY-SS-01	CML-SD-19. Tailings approx. 1 ft thick, distinct clay layer below.
Date: 7/11/2011	Date: 7/13/2011
Photo Key: 324	Photo Key: 325
Mercury vapor analysis with the Jerome 431-X	Excavating CMN-SS-05
Date: 7/14/2011	Date: 7/14/2011

APPENDIX M. PHOTO LOG - RECLAMATION INVESTIGATION

BLACK PINE MINE

Photo Key: 326	Photo Key: 327
	CMN-SS-05. Middle excavation
Date: 8/10/2011	Date: 7/14/2011
Photo Key: 328	Photo Key: 329
CMN-SS-05	CMN-SS-05. Cover ranged from 4 - 6 ft thick.
Date: 7/14/2011	Date: 7/14/2011

APPENDIX M. PHOTO LOG - RECLAMATION INVESTIGATION

BLACK PINE MINE

Photo Key: 330	Photo Key: 331
Excavating at CMN-SS-05	CMN-SS-05
Date: 7/14/2011	Date: 7/14/2011
Photo Key: 332	Photo Key: 333
post-excavation at CMN-SS-05	Excavating CMN-SS-06
Date: 7/14/2011	Date: 7/14/2011

APPENDIX M. PHOTO LOG - RECLAMATION INVESTIGATION

BLACK PINE MINE

Photo Key: 334

CMN-SS-06. Waste rock approx 1.5 ft thick. Cover approx. 0.5 ft

Date: 7/14/2011

Photo Key: 335

CMN-SS-04

Date: 7/14/2011

Photo Key: 336

CMN-SS-04. Approximately 1.5 feet of cover. Waste rock layer 2-5 ft thick

Date: 7/14/2011

Photo Key: 337

Excavator at CMN-SS-04

Date: 7/14/2011

APPENDIX M. PHOTO LOG - RECLAMATION INVESTIGATION

BLACK PINE MINE

Photo Key: 338 	
Date: 8/10/2011	Date:

APPENDIX M. PHOTO LOG - RECLAMATION INVESTIGATION

BLACK PINE MINE

	CMN-SS-10
Date: 8/10/2011	Date: 7/14/2011
CMN-SS-14	CMN-SS-14
Date: 7/14/2011	Date: 7/14/2011

APPENDIX M. PHOTO LOG - RECLAMATION INVESTIGATION

BLACK PINE MINE

Test pit 2, spoil pile.	Test pit 1. Sampling soils
Date: 7/12/2011	Date: 7/12/2011
Test pit 2.	Test pit 1, Backfilled.
Date: 7/12/2011	Date: 7/12/2011

APPENDIX M. PHOTO LOG - RECLAMATION INVESTIGATION

BLACK PINE MINE

Test pit 1. beginning of excavation

Date: 7/12/2011

Test pit 1. Digging is very hard.

Date: 7/12/2011

Test pit 1. Digging is hard, shallow bedrock.

Date: 7/12/2011

Test pit 1. Spoil piles.

Date: 7/12/2011

APPENDIX M. PHOTO LOG - RECLAMATION INVESTIGATION

BLACK PINE MINE

Test pit 1, spoile piles digging is very hard. south side of test pit.

Date: 7/12/2011

Test pit 1, completed south side of test pit.

Date: 7/12/2011

Test pit 1 completed.

Date: 7/12/2011

Test pit 2 Backfilled.

Date: 7/12/2011

APPENDIX M. PHOTO LOG - RECLAMATION INVESTIGATION

BLACK PINE MINE

Test pit 2 backfilled

Date: 7/12/2011

Test pit 3 Spoil Pile. Material from bottom of test pit.

Date: 7/12/2011

Test pit 3, spoil pile from bottom of pit.

Date: 7/12/2011

Test pit 3, full depth of test pit. north side of pit.

Date: 7/12/2011

APPENDIX M. PHOTO LOG - RECLAMATION INVESTIGATION

BLACK PINE MINE

Test pit 3, side wall photo of north side of test pit.

Date: 7/12/2011

Test pit 3 Side wall photo

Date: 7/12/2011

Test pit 3 Final Depth, east end of test pit sidewall.

Date: 7/12/2011

Test pit 3. Heavely forested area north of test pit. spoil pile from final buck of material from test pit.

Date: 7/12/2011

APPENDIX M. PHOTO LOG - RECLAMATION INVESTIGATION

BLACK PINE MINE

Test pit 3 Final Depth. Sidewall of north end of test pit.

Date: 7/12/2011

Test pit 3 Topsoil in pit

Date: 7/12/2011

Test pit 3 spoil pile and North west side wall of pit.

Date: 7/12/2011

Test pit 4 west end of test pit at final depth

Date: 7/12/2011

APPENDIX M. PHOTO LOG - RECLAMATION INVESTIGATION

BLACK PINE MINE

Test pit 4 Sidewall photo

Date: 7/12/2011

Test pit 4 Spoil Pile, The dark material is from the last bucket.

Date: 7/12/2011

Test pit 4 Sidewall photo of seep at 3 foot

Date: 7/12/2011

Test pit 4 sidewall photo

Date: 7/12/2011

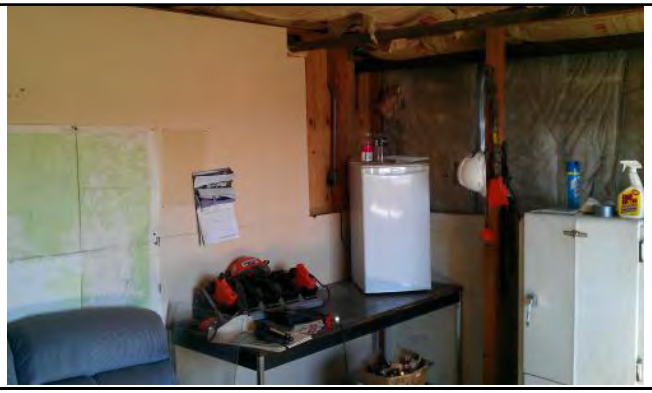
APPENDIX M. PHOTO LOG - RECLAMATION INVESTIGATION

BLACK PINE MINE

Test pit 5 Completed excavation prior to backfill	Test pit 5
Date: 7/12/2011	Date: 7/12/2011
Test pit 5 Spoil Pile	Hazardous Materials Inventory
Date: 7/12/2011	Date: 8/15/2011

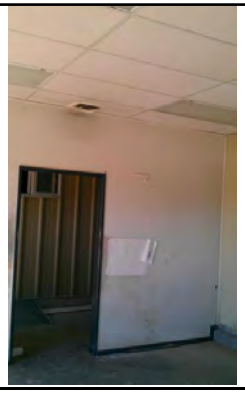
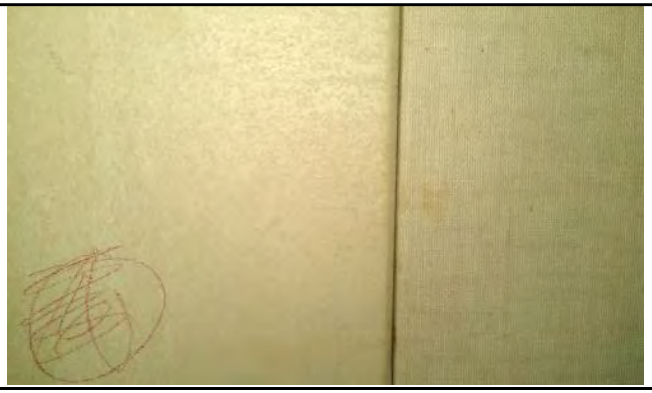
APPENDIX M. PHOTO LOG - RECLAMATION INVESTIGATION

BLACK PINE MINE

	
Hazardous Materials Inventory	Hazardous Materials Inventory
Date: 8/15/2011	Date: 8/15/2011
Hazardous Materials Inventory	Hazardous Materials Inventory
Date: 8/15/2011	Date: 8/15/2011

APPENDIX M. PHOTO LOG - RECLAMATION INVESTIGATION

BLACK PINE MINE

	
Hazardous Materials Inventory	Hazardous Materials Inventory
Date: 8/15/2011	Date: 8/15/2011
	
Hazardous Materials Inventory	Hazardous Materials Inventory
Date: 8/15/2011	Date: 8/15/2011

APPENDIX M. PHOTO LOG - RECLAMATION INVESTIGATION

BLACK PINE MINE

Hazardous Materials Inventory	Hazardous Materials Inventory
Date: 8/15/2011	Date: 8/15/2011
Hazardous Materials Inventory	Hazardous Materials Inventory
Date: 8/15/2011	Date: 8/15/2011

APPENDIX M. PHOTO LOG - RECLAMATION INVESTIGATION

BLACK PINE MINE

Hazardous Materials Inventory	Hazardous Materials Inventory
Date: 8/15/2011	Date: 8/15/2011
Hazardous Materials Inventory	Hazardous Materials Inventory
Date: 8/15/2011	Date: 8/15/2011

APPENDIX M. PHOTO LOG - RECLAMATION INVESTIGATION

BLACK PINE MINE

Hazardous Materials Inventory	Hazardous Materials Inventory
Date: 8/15/2011	Date: 8/15/2011
Hazardous Materials Inventory	Hazardous Materials Inventory
Date: 8/15/2011	Date: 8/15/2011

APPENDIX M. PHOTO LOG - RECLAMATION INVESTIGATION

BLACK PINE MINE

Surface water sampling	Surface water sampling
Date: 7/12/2011	Date: 7/12/2011
Surface water sampling	Surface water sampling
Date: 7/12/2011	Date: 7/12/2011