Explanation of Significant Differences
KRY Site
Kalispell, Montana

Prepared By:

Montana Department of Environmental Quality
Remediation Division
Helena, Montana

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TABLE OF CONTENTS

Section Page

1.0 INTRODUCTION TO THE SITE AND STATEMENT OF PURPOSE....1
1.1 Site Name and Location....1
1.2 Status of ROD Implementation....1
1.3 Evaluating Changes to the ROD....3
1.4 Changes to the ROD....4
1.5 Documenting Post-ROD Changes....5
1.6 Affirmation of Statutory Determination....5

2.0 SUMMARY OF SITE HISTORY, CONTAMINATION & SELECTED REMEDY....6
2.1 Site History....6
2.1.1 Kalispell Pole & Timber....6
2.1.2 Reliance Refining Company....6
2.1.3 Yale Oil Corporation....6
2.2 KRY Site Contamination....6
2.2.1 Groundwater....7
2.2.2 Soil....7
2.2.3 Surface Water & River Sediments....8
2.3 Selected Remedy....8
2.3.1 Site-Wide Elements....8
2.3.2 Soil....9
2.3.3 Groundwater....10

3.0 BASIS FOR THE ESD AND DESCRIPTIONS OF SIGNIFICANT DIFFERENCES....11
3.1 Offsite Disposal of Petroleum-Contaminated Soils....11
3.2 Buried Sawdust....13
3.2.1 Collection of Additional Data....14
3.2.2 Determination That Buried Sawdust Can Be Left In-Place....16
3.3 Correlation-Based Cleanup Level for PCP in Subsurface Soils....18
3.3.1 Development of a Total PCP vs. SPLP PCP Correlation....18
3.3.2 Application of the Correlation-Based Cleanup Level....19
3.4 Updated Toxicity Information for Dioxins/Furans....19
3.5 Updated Toxicity Equivalence Reference....21

4.0 PUBLIC PARTICIPATION....23

5.0 ADMINISTRATIVE RECORD REFERENCES....24

List of Figures

1 Site Location Map
2 Vicinity Map

List of Appendices

A Cost Estimates
B Figures from *Work Plan for Methane Investigation*
C Tables and figures from *KRY Site Sawdust Investigation Report Rev 1*
D Tables and figures from *KRY Site Methane Investigation Report*
E Table from *October 2011 Groundwater Monitoring Report KRY Site*
F Tables and figures from *Memorandum: Results of KRY Site Sample Collection for Total PCP/SPLP PCP Correlation Revision 1*
G Dioxins/Furans Subsurface Soil Cleanup Level Spreadsheet

Acronyms and Abbreviations

ARM	Administrative Rules of Montana
bgs	Below ground surface
BNSF	BNSF Railway Company
CalEPA	California Environmental Protection Agency
CEC	Cation exchange capacity
cm/sec	Centimeters per second
COC	Contaminant of concern
DAF	Dilution attenuation factor
DEQ	Montana Department of Environmental Quality
DNRC	Montana Department of Natural Resources and Conservation
DO	Dissolved oxygen
DTSC	California Department of Toxic Substances Control
EPA	U.S. Environmental Protection Agency
ERCLs	Environmental requirements, criteria, and limitations
ESD	Explanation of Significant Difference
GMHR	Gascoyne Materials Handling & Recycling, LLC
IC	Institutional control
IRIS	Integrated Risk Information System
KPT	Kalispell Pole and Timber
KRY Site	Kalispell Pole and Timber (KPT), Reliance Refining Company (Reliance), and Yale Oil Corporation (Yale Oil) Facilities
LDR	Land disposal restriction
LEL	Lower explosive limit
LTU	Land-treatment unit
MCA	Montana Code Annotated
mg/kg	Milligrams per kilogram (parts per million)
MNA	Monitored natural attenuation
ng/kg	Nanograms per kilogram (parts per trillion)
NDCC	North Dakota Century Code
OME	Ontario Ministry of the Environment
ORP	Oxidation reduction potential
PAH	Polycyclic aromatic hydrocarbon
PCP	Pentachlorophenol

pg/L	Picograms per liter (parts per quadrillion)
ppmv	Parts per million by volume
RCRA	Resource Conservation and Recovery Act
ROD	Record of Decision
SSCL	Site-specific cleanup level
SPLP	Synthetic Precipitation Leaching Procedure
SVOC	Semi-volatile organic compounds
TEF	Toxicity equivalence factor
TEQ	Toxicity equivalence quotient
TOC	Total organic carbon
TPH	Total petroleum hydrocarbons
ug/L	Micrograms per liter (parts per billion)
UCL	Upper confidence limit
UEL	Upper explosive limit
VOC	Volatile organic compound
WHO	World Health Organization

1.0 INTRODUCTION TO THE SITE AND STATEMENT OF PURPOSE

1.1 SITE NAME AND LOCATION

The Kalispell Pole & Timber (KPT), Reliance Refining Company (Reliance), and Yale Oil Corporation (Yale Oil) Facilities (collectively referred to as the KRY Site) are located on the northeastern edge, but outside the city limits, of the City of Kalispell in the community of Evergreen in Flathead County, Montana (Township 28 North, Range 21 West, Sections 5 and 8) (see Figure 1). The surficial boundaries of the KRY Site generally extend from the Stillwater River on the north and west, Highway 2 and the BNSF Railway Company (BNSF) railroad line on the east, Montclair Drive on the south, and Whitefish Stage Road on the west. The actual KRY Site boundaries are based on the extent of contamination, and groundwater contamination is known to extend to the southeast outside of these general boundaries and across Highway 2 and covers approximately 75 acres. The fenced area north of the junction of the mainline and spurline railroad tracks and adjacent to (east of) the railroad tracks is also part of the KRY Site. The KRY Site is adjacent to the Stillwater River and includes a residential area (see Figure 2). The Montana Department of Environmental Quality (DEQ) issued the Record of Decision (ROD) on June 30, 2008. In that ROD, DEQ determined that the facilities comprised one facility and would be addressed comprehensively as one facility, the KRY Site (DEQ 2008).

1.2 STATUS OF ROD IMPLEMENTATION

In judicial orders dated November 5, 2007, and February 10, 2009, the Montana First Judicial District Court (Court) found BNSF liable for cleanup of the KPT and Reliance facilities. After DEQ issued the ROD, BNSF sued DEQ and, in December 2011, the Court ruled in DEQ's favor, finding that the ROD was issued in compliance with Montana law and that BNSF was required to implement it. With the Court's affirmation of DEQ's remedy selection in the ROD, BNSF is implementing the cleanup selected in the ROD under the oversight of DEQ.

Several additional entities signed Consent Decrees with DEQ and are participating in portions of the selected remedy. Montana Mokko, Inc., the Montana Department of Natural Resources and Conservation (DNRC), Stillwater Forest Products, Inc., and Swank Enterprises have agreed to provide access to DEQ and parties conducting DEQ-approved actions to implement the remedy and these parties must also record and abide by land use restrictions affecting their respective properties. Klingler Lumber Company, Inc. also signed a settlement agreement with DEQ that has similar access and land use restriction requirements. In addition, DNRC and Swank Enterprises agreed to reimburse DEQ and parties conducting DEQ-approved remedial actions for a percentage of the cleanup costs.

The following is a summary of DEQ's selected remedy for the KRY Site, as identified in the ROD (DEQ 2008):

- Free product extraction and disposal: The selected remedy for less viscous free product on the groundwater in the western and eastern portions of the KRY Site utilizes recovery methods such as trenches or recovery wells, and offsite disposal of the recovered product.

- Chemical oxidation of groundwater: In-situ chemical oxidation is the selected remedy for treatment of dissolved-phase pentachlorophenol (PCP) and dioxins/furans-contaminated groundwater.

- Excavation and offsite disposal: Excavation of soil down to the water table to allow for recovery of free product in the groundwater, possibly using booms or skimming devices, is the selected remedy for more-viscous free product in the eastern portion of the KRY Site. Recovered product will be recycled, if possible. Visible sludge in soil will be excavated and recycled in an asphalt batch plant, or as industrial fuel. Characterization sampling for disposal purposes and a treatability study to determine if the sludge is appropriate for use in an asphalt batch plant may be required during the design phase. Lead-contaminated soils will be excavated and stabilized, if necessary, and disposed of offsite.

- Excavation, ex-situ treatment, and backfill: Excavation of contaminated soils followed by treatment in a land treatment unit (LTU) (equipped with a liner and leachate collection system, if necessary) is the selected remedy for soils contaminated with PCP (by itself, or in combination with dioxins/furans), petroleum hydrocarbons, and polynuclear aromatic hydrocarbons (PAHs). The PCP-contaminated media is from process residuals, preservative drippage, and spent formulations from a wood treating process that used chlorophenolic formulations as defined in 40 CFR Part 261, part of the Resource Conservation and Recovery Act (RCRA). Therefore, DEQ determined that the PCP at the KRY Site is F032 listed hazardous waste. Therefore, upon excavation, PCP-contaminated soils must be handled as an FO32 listed hazardous waste; therefore, more than one LTU will be constructed to ensure proper segregation of PCP-contaminated soils and compliance with RCRA requirements. Once treated, soils will be available for use as backfill material onsite, although clean fill may also be brought in to allow for more rapid redevelopment of the KRY Site.

- Soil Barriers: The soils contaminated with dioxins/furans only (no PCP) are not FO32 listed hazardous waste. Therefore, excavated soils contaminated with dioxins/furans only will be consolidated and capped in an onsite repository. In addition, if the dioxins/furans-contaminated soils treated in the LTU are unable to be treated to at or below dioxins/furans site-specific cleanup levels (SSCLs), those soils will also be included in the repository and capped. Institutional controls in the form of restrictive covenants, engineering controls, and long-term maintenance are needed to ensure the repository is not compromised.

- Monitored Natural Attenuation for Petroleum and Metals: High concentrations of petroleum hydrocarbons and metals (arsenic, iron, and manganese) in groundwater exist near the source areas on the eastern and western portions of the KRY Site. This contamination is closely tied to the presence and breakdown of petroleum hydrocarbons and sludge in soils and free product on the groundwater, which creates chemical conditions that allow metals to be removed from soil, at which point they become dissolved in groundwater. The selected remedy relies on removal of the free product and overlying petroleum-contaminated soils to remove the source of contamination, at which point concentrations of dissolved petroleum hydrocarbons and metals attributable to these sources will decrease through natural

processes. In addition, the ROD provided for additional evaluation of the effects of buried sawdust present on the northwestern portion of the KRY Site which may also contribute to metals in groundwater.

- Institutional Controls: The selected remedy relies on institutional controls in the form of land use restrictions (restrictive covenants) and a controlled groundwater area. Land use will be restricted to commercial/industrial use and no additional wells, with the exception of those installed as part of the remedial action, will be installed within or adjacent to the KRY Site through a controlled groundwater area and restrictive covenants.

- Engineering controls: Engineering controls such as fencing will be necessary during implementation of the remedy, in order to protect workers and onsite businesses from open excavations and/or heavy equipment, as well as to restrict access to the LTUs, stockpiled soils, and the onsite repository. Dust suppression activities will also be utilized during implementation of the remedy.

- Long-Term Monitoring: Monitoring is necessary to evaluate the effectiveness of the remedy and to ensure that adjacent residential, commercial, and public water supply wells do not become contaminated. At a minimum, monitoring of selected wells will be conducted on a semi-annual basis for the first five years and at a reduced frequency thereafter, until SSCLs are achieved.

BNSF completed the lead-contaminated soil excavation and offsite disposal portion of the ROD remedy in November 2010. BNSF began implementing the chemical oxidant treatment of the PCP and dioxins/furans-contaminated groundwater around the former wood treating area under a DEQ-approved work plan in late summer 2011. After a short winter break, BNSF began injection work in early March 2012 and continued injections into early summer 2012 as required under the DEQ-approved work plan. Additional injections may be necessary after implementation of the remainder of the remedy.

BNSF completed additional investigations to gather information necessary for completion of remedial design between October 2009 and August 2011. Throughout 2011 and into early 2012, BNSF prepared the engineering design documents that identify the plan for excavation, handling, and treatment of contaminated soils, as well as the recovery of more viscous free product from the water table. These documents were prepared under the oversight of DEQ. The final design report was approved by DEQ on May 24, 2012.

1.3 EVALUATING CHANGES TO THE ROD

In the ROD, DEQ indicated that it would follow the procedures outlined in the U.S. Environmental Protection Agency's (EPA) Guide to Preparing Superfund Proposed Plans, Records of Decisions, and Other Remedy Selection Decision Documents (Guide) (EPA 1999) if DEQ determined that changes to the ROD were necessary or appropriate. The Guide provides various options for documenting changes to the ROD, depending on the nature of the modification. Specifically, options include preparing a memorandum to the file, an explanation of significant difference (ESD), or a ROD amendment.

Section 7.0 of the Guide discusses how to evaluate and categorize post-ROD information. The Guide directs the lead agency (in this case, DEQ) to evaluate:

(1) Scope – whether the change alters the scope of the remedy;
(2) Performance – whether the change alters the performance; and
(3) Cost – whether there are significant changes to cost estimates in the ROD.

Once this evaluation is complete, DEQ determines whether the change is non-significant or minor, significant, or fundamental.

Non-significant or minor changes usually arise during design and construction, when modifications are made to the functional specifications of the remedy to address issues such as performance optimization or new technical issues. This type of change does not have a significant impact on the scope, performance, or cost of the remedy. Examples provided in the Guide include a small increase in the volume of soil requiring treatment; a change in the location of an onsite landfill; or changes to the groundwater monitoring schedule.

Significant changes generally involve a change to a component of a remedy that does not fundamentally alter the overall cleanup approach. Examples provided in the Guide include a large increase in volume; changing from an onsite landfill to an offsite landfill; a contingency remedy; changes in legal requirements that impact SSCLs or make the remedy no longer protective; a revision to land use; a change in secondary treatment; or requiring additional institutional controls.

Fundamental changes involve an appreciable change in the scope, performance, or cost of the ROD remedy and could come from a number of changes that together result in a fundamental change. Examples provided in the Guide include changes in the primary treatment method including those that result in a significant cost increase or decrease; a change from containment to treatment with a cost increase; invoking a technical impracticability waiver; or a volume decrease that changes the primary treatment method.

1.4 CHANGES TO THE ROD

DEQ has identified five revisions to the ROD which are being addressed in this document:

1. BNSF has requested that DEQ allow off-site treatment of the petroleum-contaminated soils on the eastern portion of the KRY Site rather than onsite treatment as provided for in the ROD. This request is based upon changes to the volume estimates brought about by post-ROD remedial design sampling. See Section 3.1.

2. The ROD provided for additional evaluation of the effects of buried sawdust present on the northwestern portion of the KRY Site. BNSF evaluated groundwater, soil gas, and indoor air during post-ROD remedial design sampling. The results demonstrate that the sawdust can remain in place with the placement of appropriate institutional controls and long-term monitoring. See Section 3.2.

3. The ROD identified an alternate approach for meeting the leaching to groundwater-based SSCLs based upon use of the synthetic precipitation leaching procedure (SPLP). During ROD implementation, BNSF used the SPLP approach and further proposed a correlation-based leaching to groundwater cleanup level. See Section 3.3.

4. The ROD identified an uncertainty associated with the risk analysis as it related to dioxins/furans because of EPA's delay in releasing updated dioxins/furans toxicity information. Since that time, EPA has released the updated dioxins/furans toxicity information and DEQ has determined it is appropriate to incorporate that updated toxicity information for evaluation of the non-carcinogenic health effects for dioxins/furans. See Section 3.4.

5. The ROD provided that the toxicity equivalence approach found in the World Health Organization (WHO) 1998 toxicity equivalence factors (TEFs) be used when calculating a toxicity equivalence quotient (TEQ) for dioxins/furans in groundwater and identified the use of the 2005 WHO TEFs for calculating a TEQ in soil. However, since that time, EPA has indicated that the 2005 WHO TEFs should be used for all media and DEQ is using that approach in its administration and oversight of CECRA facilities. See Section 3.5.

1.5 DOCUMENTING POST-ROD CHANGES

As discussed in Section 1.3, DEQ evaluated whether the changes identified in Section 1.4 are non-significant or minor, significant, or fundamental. DEQ has determined that the changes are significant in that they generally involve a change to a component of a remedy; however, these changes do not fundamentally alter the overall cleanup approach. All of the changes discussed in Section 1.4 fall within the Guide examples of significant changes such as changing from an onsite landfill to an offsite landfill and requiring additional institutional controls, both of which were evaluated in the ROD.

The Guide indicates that significant changes can be documented through an ESD. This document will provide additional information on changes that have resulted in the remedy and the basis or rationale for those changes.

1.6 AFFIRMATION OF STATUTORY DETERMINATIONS

After reviewing the identified changes to the selected remedy, DEQ has determined that the remedy is protective of public health, safety, and welfare and the environment, complies with applicable or relevant state and federal environmental requirements, criteria, and limitations (ERCLs), mitigates risk, is effective in the short- and long-term, is practicable and implementable, uses treatment and resource recovery technologies, and is cost-effective.

2.0 SUMMARY OF SITE HISTORY, CONTAMINATION, AND SELECTED REMEDY

2.1 SITE HISTORY

2.1.1 Kalispell Pole & Timber

KPT is a former wood treating operation that operated from approximately 1945 to 1990. Soils and groundwater were contaminated from spills or leaks of diesel-based wood treating oil that contained PCP and dioxins/furans from the treatment vats and aboveground storage tanks as well as drippage from treated wood. Contaminants include PCP, dioxins/furans, PAHs, and petroleum hydrocarbons, including free product. Groundwater is also contaminated with dissolved metals associated with the breakdown of petroleum hydrocarbons and free product (DEQ 2008). A detailed discussion of the history, regulatory events, investigations, and interim actions related to the KPT Facility can be found in the ROD.

2.1.2 Reliance Refining Company

Reliance is a former oil refinery that operated from 1924 to the 1960s. The surficial portion of Reliance encompasses approximately seven acres. Onsite disposal of sludge, leaks of sludge and oil from aboveground storage tanks, and releases of petroleum products from the operations of the refinery and the railroad contaminated the soil with petroleum hydrocarbons and some metals, notably lead. Groundwater beneath Reliance is contaminated with petroleum hydrocarbons, including free product, PCP, dioxins/furans, and PAHs. Groundwater is also contaminated with dissolved metals associated with the breakdown of petroleum hydrocarbons and free product (DEQ 2008). A detailed discussion of the history, regulatory events, investigations, and interim actions related to the Reliance Facility can be found in the ROD.

2.1.3 Yale Oil Corporation

Yale Oil is a former petroleum bulk plant and product refinery that operated from 1938 to 1978. The surficial portion of Yale Oil encompasses approximately two acres. Leaks and possible spills from aboveground storage tanks contaminated onsite soils. Thermal desorption, using a permitted unit, was conducted on the soils to remove petroleum hydrocarbon contamination. However, groundwater beneath Yale Oil is contaminated with low-levels of PCP, dioxins/furans, and petroleum hydrocarbons (DEQ 2008). A detailed discussion of the history, regulatory events, investigations, and interim actions related to the Yale Oil Facility can be found in the ROD.

2.2 KRY SITE CONTAMINATION

Details of the KRY Site contamination prior to implementation of the selected remedy are found in the ROD (DEQ 2008) and are summarized in the following sections.

2.2.1 Groundwater

As described in the ROD, groundwater at the KRY Site is contaminated with semi-volatile organic compounds (SVOCs) including PCP and PAHs, dioxins/furans, volatile organic compounds (VOCs), petroleum hydrocarbons, and metals at levels greater than the SSCLs. The highest levels of PCP (detected at a maximum concentration of 16,300 micrograms per liter (ug/L)), dioxins/furans (maximum concentration of 1,346 picograms per liter (pg/L)), and SVOCs (for instance naphthalene, detected at a maximum concentration of 178 ug/L) in groundwater at the KRY Site were found to be associated with the western portion of the KRY Site. Lower levels of PCP, dioxins/furans, and SVOCs were found in other areas of the KRY Site. The extent of the contamination in the shallow (20-30 feet below ground surface (bgs)) groundwater has generally been determined. However, the eastern edge of groundwater contamination is not well defined in the deeper (100+ feet bgs) groundwater near the Town Pump on Highway 2 East. The highest levels of petroleum contamination (for instance C5-C8 aliphatics, detected at a maximum concentration of 8,550 ug/L) at the KRY Site were found within the source areas on the eastern and western portions of the KRY Site. Lower levels were found in the southeastern portion of the KRY Site. The highest levels of metals contamination (for instance, iron and manganese detected at maximum concentrations of 18,990 ug/L and 12,570 ug/L, respectively) were found within the source area on the eastern portion of the KRY Site. Lower levels were found in other areas of the KRY Site (DEQ 2008).

As described in the ROD, a large area of free product floats on the groundwater on the eastern and western portions of the KRY Site and free product thicknesses are generally less than one foot. The free product present at the KRY Site consists of petroleum hydrocarbons and wood treating fluids, which were mixed with petroleum hydrocarbons. The free product on the western portion of the KRY Site is light brown in color with a strong chemical odor. Some of the free product on the eastern portion of the KRY Site is dark-brown to black in color, extremely viscous (almost tarlike) and has a strong petroleum odor. The remainder of the free product on the eastern portion of the KRY Site is similar to that on the western portion (DEQ 2008).

2.2.2 Soil

As described in the ROD, surface and subsurface soils at the KRY Site are contaminated with SVOCs (for instance naphthalene, detected at a maximum concentration of 260 milligrams per kilogram (mg/kg)) including PCP (maximum concentration of 6,900 mg/kg) and PAHs (for instance benzo(b)fluoranthene, detected at a maximum concentration of 5.47 mg/kg), dioxins/furans (maximum concentration of 171,510 nanograms per kilogram (ng/kg)), VOCs (for instance ethylbenzene, detected at a maximum concentration of 83 mg/kg), petroleum hydrocarbons (for instance C19-C36 aliphatics, detected at a maximum concentration of 402,000 mg/kg), and metals, most notably lead (maximum concentration of 44,300 mg/kg) (DEQ 2008). As previously discussed, BNSF completed the lead-contaminated soil excavation and offsite disposal portion of the ROD remedy in November 2010.

Petroleum sludge is also present on the eastern portion of the KRY Site. The ROD indicated that the sludge is not classified as a RCRA hazardous waste based on sample results available at that

time (DEQ 2008). However, post-ROD sampling has identified that some of the sludge contains FO32 hazardous waste and BNSF will handle and dispose of the sludge accordingly.

An isolated area of buried sawdust exists in the vicinity of monitoring well KRY-103A, located in the northwestern corner of the KRY Site. Based on the well log for monitoring well KRY-103A, the sawdust extends to a depth of approximately 14 feet in this area. A summary of post-ROD sawdust investigations is provided in Section 3.2.

2.2.3 Surface Water and River Sediments

As described in the ROD, the KRY Site has not impacted surface water or river sediments and no additional investigation or cleanup of the river is necessary as part of the remedial action (DEQ 2008).

2.3 SELECTED REMEDY

DEQ selected a combination of alternatives to cleanup soil and groundwater and address free product and sludge in the ROD (DEQ 2008). These include free product recovery methods (such as trenches or recovery wells) for less viscous free product on groundwater and excavation for more viscous free product, chemical oxidation for treatment of the dissolved organic-contaminants of concern (COCs) plume in groundwater, monitored natural attention (MNA) for inorganics and petroleum in groundwater, excavation of contaminated soils combined with ex-situ treatment (LTU for PCP and petroleum-contaminated soils, stabilization of lead-contaminated soils) and offsite disposal (lead contaminated soils and sludge in soils), capping (dioxins/furans-contaminated soils repository), institutional controls, and long-term monitoring. Engineering controls (fencing and dust control measures) and air monitoring will be included as necessary during implementation of the remedy (DEQ 2008).

2.3.1 Site-Wide Elements

<u>Long-Term Monitoring</u>
The selected remedy includes monitoring site media during remedy construction and long-term operation and maintenance. Long-term monitoring will include sampling and analysis of groundwater wells to confirm the satisfactory performance of the remedy; ensure protection of public health, safety, and welfare, and the environment during remedy implementation; verify attainment of SSCLs; confirm achievement of remedial action objectives; and verify compliance with ERCLs. The plan will also include operation of the LTU, measurement of free product thickness, and inspection and maintenance of the dioxin repository cap, fencing and vegetation (DEQ 2008).

<u>Institutional Controls</u>
DEQ will petition the Montana Department of Natural Resources and Conservation (DNRC) to establish a controlled groundwater area under Sections 85-2-501, et seq., Montana Code Annotated (MCA), for the KRY Site. The basis of the petition will be that excessive groundwater withdrawals would cause contaminant migration and that water quality within the groundwater

area is not suited for a specific beneficial use. Control provisions will remain until SSCLs are met within the KRY Site (DEQ 2008).

The selected remedy includes a requirement that the property owners of the contaminated properties and properties where engineered components of the remedy have been or will be constructed restrict property use through the placement of restrictive covenants under Section 75-10-727, MCA, satisfactory to DEQ. Restrictive covenants prohibiting residential use and groundwater use are also required until DEQ determines they are no longer needed to ensure protection of human health. Changes to local zoning regulations may also be proposed. Finally, the remedy calls for capping of the dioxins/furans-contaminated soils in an onsite repository. Once the repository is complete, it will be surveyed and appropriate restrictions will be placed on the repository property to restrict access, development, excavation of contaminants, or excavation or use of the capped soil necessary to ensure the integrity of the cover (DEQ 2008).

2.3.2 Soil

As identified in the ROD, some of the contaminated soil and sludge contains FO32 hazardous waste that requires special handling and treatment. The selected remedy requires excavation of soils contaminated with PCP (and co-located dioxins/furans), dioxins/furans (where not co-located with PCP), and petroleum hydrocarbons (DEQ 2008).

Soils contaminated with PCP (and co-located dioxins/furans) will be treated to meet SSCLs through bioremediation in an onsite LTU that meets all RCRA requirements. Dioxins/furans may not be effectively treated to SSCLs through bioremediation. If, after treatment, soils still contain dioxins/furans above SSCLs, the treated soil will be placed in the onsite dioxins/furans soils repository and capped. Soils contaminated with dioxins/furans (not co-located with PCP) will also be placed into the onsite dioxins/furans soils repository and capped (DEQ 2008).

The ROD indicates that soils contaminated with petroleum hydrocarbons and contaminated soils excavated as part of the free product excavation on the eastern portion of the KRY Site will be placed in a separate onsite LTU (DEQ 2008). Please see Section 3.1 for additional discussion of the remedy for petroleum-contaminated soils.

As previously discussed, in November 2010, BNSF completed the ROD remedy for the lead-contaminated soils on the eastern portion of the KRY Site. This included stabilization of soils containing high concentrations of lead to reduce toxicity and leachability, followed by excavation and offsite disposal.

Petroleum sludge is present throughout the eastern portion of the KRY both at the surface and at depth. Sludge material that is mixed with debris and therefore not able to be recycled will be disposed of at an offsite facility. Some stabilization or solidification may be required. Sludge material that is intermixed with soil that cannot be recycled will be treated along with other petroleum contamination in an LTU. Other sludge will be recycled (DEQ 2008).

2.3.3 Groundwater

As identified in the ROD, the selected remedy requires free product removal, active treatment of the groundwater plume to speed up the cleanup process, and MNA.

A heavier, more viscous product is present on the eastern portion of the KRY Site and the remaining product at the KRY Site is a lighter, less viscous product that contains an F032 hazardous waste. The selected remedy will utilize free product recovery methods, including but not limited to, trenches or recovery wells to remove the lighter, less viscous free product from the groundwater in the western portion of the KRY Site. Once recovered, the product determined to contain PCP through sampling will be disposed of as a hazardous waste. The more viscous free product in the eastern portion of the KRY Site will be excavated along with contaminated soils to ensure adequate removal of the source. Product remaining on the groundwater after excavation will be recovered, possibly using booms or skimming devices in the open excavation. The product that does not contain PCP, as confirmed through sampling, will be disposed of through a used oil recycler (DEQ 2008).

Removal of the free product and overlying contaminated soil will significantly decrease the petroleum concentrations in groundwater through time. The selected remedy for groundwater contaminated with petroleum hydrocarbons relies on excavation of contaminated soils and removal of free product on groundwater to eliminate the source of the dissolved-phase petroleum contamination followed by MNA (DEQ 2008).

In addition, high levels of iron, manganese, and arsenic exist in the groundwater near the source areas at the KRY Site. These high levels of metals are likely due to the breakdown of free product and petroleum contaminated soils in these areas. Another area of high concentrations of iron and manganese exists in the vicinity of well KRY-103A, on the northwestern edge of the KRY Site. These increased concentrations may be related to the presence of buried sawdust in this area. For the eastern portion of the KRY Site, the selected remedy relies on excavation of the contaminated soils, the more viscous free product, and the sludge to remove the source of the petroleum contamination. MNA will then be used to remedy the metals issue in groundwater over time. For the remainder of the KRY Site, excavation of contaminated soils and free product removal, followed by MNA to remove the source of the petroleum contamination, will decrease the high concentrations of metals in groundwater over time. For the sawdust area, sampling of the soil gas in the sawdust area for methane and further characterization of a reducing environment are included as part of the remedy. Based upon the results of the sampling, DEQ will determine what actions are necessary. Regular sampling as part of the long-term groundwater monitoring program will track the decline in the petroleum and metals concentrations in groundwater at the KRY Site (DEQ 2008).

As identified in the ROD, the selected remedy also expands the in-situ chemical oxidation system. The oxidant will be injected into the groundwater throughout the PCP and dioxins/furans plumes, including injections into the deeper portion of the aquifer to address contamination at depth. If PCP concentrations consistently exceed Montana's water quality standard for PCP, then the chemical oxidation system will be expanded to treat contaminated groundwater in the deeper portion of the aquifer in the northern portion of the KRY Site. If dissolved petroleum

contamination is present in this area, the chemical oxidation system will also be effective in treating that contamination (DEQ 2008). As discussed in Section 1.2, BNSF began injecting the chemical oxidant to treat the PCP and dioxins/furans-contaminated groundwater in late summer 2011 through early summer 2012. Additional injections may be necessary after implementation of the remainder of the remedy.

Long-term monitoring will include sampling of some of the following: existing monitoring wells, additional wells that may be installed as part of remedial design or remedy, and existing nearby residential or commercial wells. DEQ will determine the appropriate sampling locations and frequency during remedial design. Should detections of contaminants occur in residential or commercial wells at levels at or in excess of SSCLs, DEQ will require immediate resampling of the well. Should the initial detected concentration be verified, DEQ will require immediate connection of the residence or business to the public water supply provided through the Evergreen Water District (DEQ 2008).

3.0 BASIS FOR THE ESD AND DESCRIPTIONS OF SIGNIFICANT DIFFERENCES

3.1 OFFSITE DISPOSAL OF PETROLEUM-CONTAMINATED SOILS

The ROD required excavation and treatment of petroleum hydrocarbon-contaminated soils in an onsite petroleum-only LTU. However, BNSF conducted sampling to support remedial design in the fall of 2009 and winter of 2010 which indicated that the volume of soil exceeding SSCLs was less than estimated in the ROD at approximately 8,300 bank cubic yards, or approximately 10,375 cubic yards. A bank cubic yard is equal to 27 cubic feet (3 feet x 3 feet x 3 feet) of soil in place; once excavated and loaded, the original 1 bank cubic yard of soil expands to approximately 1.25 cubic yards of soil. As a result of this sampling and the associated cost differences, BNSF submitted a technical memorandum (AECOM 2012a) to DEQ proposing to transport the excavated petroleum-contaminated soils to the Gascoyne Materials Handling & Recycling, LLC (GMHR) facility in Gascoyne, North Dakota, where it would be treated in an LTU. The technical memorandum provided details about the GMHR facility, how the soils would be treated, and identified the rationale to support the offsite transport and treatment of petroleum-contaminated soils from the KRY Site, including cost estimates. In July 2012, BNSF identified a project-specific reduced rail transportation rate for shipment of contaminated soils (BNSF 2012). As a result, the cost estimate for shipment and treatment of petroleum contaminated soils in the GMHR LTU was revised to reflect the reduced transportation costs (AECOM 2013).

DEQ has evaluated the information submitted by BNSF regarding the GMHR facility, as well as the cost estimates for onsite treatment in an LTU and offsite treatment in an LTU. After its evaluation, DEQ has determined that treatment of the KRY Site petroleum-contaminated soils in an offsite LTU is essentially equivalent to the ROD requirement for onsite treatment, but at a lesser cost. Cost savings are estimated at approximately $281,610, as summarized in Table 1. These costs do not include restoration costs because restoration is common to both onsite and

offsite options. Since these estimates were developed for comparative purposes, no contingencies were included in the cost estimates. While the ROD soil volume estimates were reported in cubic yards, both the cost estimate for the treatment of petroleum-contaminated soils in an onsite LTU and the cost estimate for treatment in an offsite LTU rely on the reduced volume estimates from the post-ROD design investigations and are measured in bank cubic yards. Therefore, even though the revised cost estimates use different units from those identified in the ROD, the difference has no impact on the overall cost difference since the cost estimates being compared both use the same bank cubic yard volume of soil. Detailed cost estimates are included in Appendix A.

Table 1: Onsite versus Offsite Petroleum LTU Cost Comparison

Offsite Hydrocarbon LTU*		**Onsite Hydrocarbon LTU****	
Item Description	**Cost**	**Item Description**	**Cost**
Load soil to railcars	$164,091	LTU construction	$310,541
Transportation	$370,832	Soil screening	$28,635
Soil Disposal	$239,123	Load soil to LTU	$31,042
Import & place clean backfill	$224,550	LTU operation	$742,959
		Load out treated soils	$128,375
		LTU closure	$38,655
Total	**$998,596**	**Total**	**$1,280,207**

* Source is AECOM 2013
** Source is AECOM 2012a

The GMHR facility is permitted in North Dakota and operates in compliance with the North Dakota Solid Waste Management and Land Protection Act (Ch. 23-29 North Dakota Century Code [NDCC]) and Solid Waste Management Rules (Art. 33-20 NDCC). The GMHR LTU is permitted for 120 acres, but is currently only utilizing approximately 40 acres for LTU operations. The GMHR LTU is underlain by approximately 60 feet of competent silty clay with a permeability of 1.9 x10-7 centimeters per second (cm/sec).

The GMHR facility's LTU operating procedures include treatment of impacted soil within the LTU to a concentration of 100 milligrams per kilogram (mg/kg) total petroleum hydrocarbons (TPH) using windrows. GMHR performs nutrient blending with the impacted soil utilizing manure from nearby feedlots, fertilizer from railcar cleaning operations and straw. A compost machine turns the soil in windrows every one to two weeks during the treatment season. Soil is typically treated during two to three treatment seasons depending on the TPH concentrations and presence of lighter-end or heavier-end petroleum hydrocarbons. Once the soil meets treatment standards, it is used as daily cover within GMHR's onsite landfill.

GMHR has an internal system for tracking soil by windrow based on its origination and will be required to prepare a letter to BNSF, as the entity implementing the remedy, once the soil has been treated to the permit requirements.

The design of the GMHR LTU meets or exceeds DEQ's requirements for the KRY Site onsite LTU and the treatment methodology is similar to what would be required for operation of an

onsite LTU. Additionally, the ability to track the treatment of the contaminated soils and document when treatment is complete will allow similar documentation as would occur with an onsite LTU. No additional or different ERCLs are identified for the treatment of petroleum-contaminated soils in an offsite LTU because DEQ already identified transportation-related ERCLs related to offsite remedies in Appendix A of the ROD (DEQ 2008). Therefore, DEQ has determined that the protectiveness and ERCLs criteria will be met with this revised approach.

There are also other identified project advantages:

- Management of the petroleum-contaminated soil at an offsite facility will better accommodate the uncertainties with the current hydrocarbon impacted soil volume. While historical data exists that shows exceedances of ROD SSCLs, sampling in 2009 and 2010 did not identify exceedances in the same areas. Therefore, there is some uncertainty to the actual volume of soil requiring treatment in the petroleum LTU, which leads to uncertainty on the required size of the LTU. If the LTU size is overestimated, the capital costs to construct the LTU may be inaccurate and incurred costs may be unnecessary.
- The GMHR LTU is serviced by a railroad spur, which will allow rail transportation of the petroleum contaminated soil from the rail spur at the KRY Site directly to GMHR. BNSF has agreed to reduce its transportation costs for this project by at least 20% on shipments to Gascoyne.
- Eliminating the construction of the onsite petroleum LTU will free up space during construction (approximately 2-3 acres) for other uses (i.e., material storage areas, contractor laydown areas, etc.).
- The estimated lifetime for the onsite LTU is approximately 12 years; therefore, elimination of the onsite LTU will allow the property to be available for other usage or redevelopment sooner. BNSF estimates that excavation and offsite disposal will be complete by 2014.
- Odors, dust and noise from the onsite petroleum LTU will be eliminated thus reducing overall impacts associated with the LTUs at the KRY Site since there will only be one LTU.

Therefore, the ROD requirement for treatment of the petroleum-contaminated soils in an onsite LTU is replaced with treatment of the petroleum-contaminated soils in an offsite LTU.

3.2 BURIED SAWDUST

The ROD required collection of additional information on the reduction/oxidation potential and soil gas in the sawdust area before a determination could be made of whether the material can be left in place. The ROD also stated that, based upon the results of the sampling, DEQ would determine what actions are necessary, if any.

The decomposition of the buried sawdust in the northwestern portion of the KRY Site has the potential to create reducing geochemical conditions which can cause the metals naturally occurring in the soil to be mobilized and become dissolved in the groundwater at concentrations

in excess of SSCLs (Ontario Ministry of the Environment (OME) 2004). Additionally, the decomposition of the sawdust material is likely to produce biogenic methane (AECOM 2011a). Methane is lighter than air, colorless, odorless, non-carcinogenic, flammable, and potentially explosive when it is present at concentrations in excess of 50,000 parts per million by volume (ppmv) in the presence of oxygen in the breathing zone (California Department of Toxic Substances Control [DTSC] 2005).

The concentration level at which a gas, like methane, has the potential to explode is called the explosive limit. The potential for a gas to explode is determined by its lower explosive limit (LEL) and upper explosive limit (UEL). Methane is explosive between its LEL of 5% by volume (50,000 ppmv) and its UEL of 15% by volume (150,000 ppmv). At concentrations below its LEL and above its UEL, methane is not explosive. Methane can create explosive conditions if allowed to collect in confined spaces, such as utility rooms, in overlying buildings, or manholes (ATSDR 2001).

At any site with methane, there is a potential for methane to accumulate within nearby structures, or migrate through utility trenches or the sand or gravel sub-base beneath paved roads or buildings (DTSC 2005). However, as shown on Figure 1-2 of the AECOM *Work Plan for Methane Investigation* (see Appendix B), there are no underground utilities or other conduits for methane migration (paved roads with sub-base or other below ground conduits) within the sawdust area (AECOM 2011a).

To comply with the requirements for collection of additional information in the ROD and to further determine the potential extent of methane associated with the buried sawdust, BNSF conducted additional sampling and monitoring as outlined in the following sections.

3.2.1 Collection of Additional Data

<u>Soil Gas Sampling for Methane</u>

As described in the KRY Site Sawdust Investigation Report Rev 1, Kalispell, Montana dated April 2011 (AECOM 2011), BNSF installed four soil gas sampling points (VP-1 through VP-4) in four directions approximately 100 feet from well KRY-103A because that well was identified as having the greatest thickness of sawdust of any well installed on the northwestern portion of the KRY Site. BNSF sampled the vapor points for the first time shortly after installation in October 2009 and then quarterly thereafter (see results tables and associated figure 2-1 in Appendix C). The highest measured values were reported in soil vapor point locations VP-1 and VP-3. Soil vapor point location VP-4 consistently had the lowest reported methane concentration but showed a considerable increase in methane concentrations between October 2009 and July 2010. LEL concentrations in all four vapor point locations listed above are generally high, with VP-1-09 and VP-3-09 consistently having LEL concentrations greater than 100 percent. After evaluation of these results, DEQ required additional sampling to determine the extent of methane impacts, including potential receptors.

As discussed in the KRY Site Methane Investigation Report Kalispell, Montana dated December 2011 (AECOM 2011b), in October 2011, BNSF installed 17 semi-permanent soil vapor

monitoring points in the sawdust area to evaluate the extent of methane impacts and determine potential receptors. Methane was not detected in the ambient air in the vicinity of any of the soil vapor points. The percent LEL values ranged from zero to 73 percent LEL with 11 of the monitoring points at 100 percent or greater of the LEL. Based on these results, BNSF converted seven of the semi-permanent soil vapor monitoring points into permanent soil vapor monitoring points. BNSF collected geotechnical soil samples during soil vapor monitoring point installations at the site to support later evaluation of methane mitigation measures, if necessary. There were no utilities identified in the methane investigation area that could act as preferential flow paths for methane migration. The closest identified utility line is a private power line located to the west of the scale house building providing power to a temporary above ground office building and another line southeast of the large warehouse building (see Appendix B). Other utilities near the methane investigation area were above ground. Results from the October 2011 monitoring event are included in Appendix D.

Building Survey and Indoor Air Monitoring for Methane

As described in the KRY Site Methane Investigation Report Kalispell, Montana dated December 2011 (AECOM 2011b), in October 2011, BNSF identified three buildings as potential receptors for subsurface methane and BNSF planned to survey and monitor the buildings. Of these three buildings, one was found to be a small open air structure, and therefore the building survey and monitoring were not conducted. However, for the remaining buildings, a large warehouse and a small scale house, BNSF completed a full building survey. The building survey consisted of recording construction characteristics including sub-slab presence and construction, size of building, floor plan, heating, ventilation, and air conditioning systems, presence of a crawl space or basement, presence of floor pits or drains, appearance of cracks in flooring, drains from bathrooms or sinks, presence of moisture on the floor, and presence of any other structures that would connect the air beneath the structure with air in the working area. BNSF also conducted ambient monitoring in the two buildings using a handheld combustible gas meter. Data was recorded from 10 locations within the large warehouse and from four locations within the scale house building. One sample location within the warehouse returned a value of 0.1 percent methane by volume, which is within the instrument accuracy range of ±0.3% for methane readings up to 5%. No methane was detected at any of the other sample locations in either building, indicating that there are no current risks to onsite workers from methane. The buildings surveyed are identified in Appendix D.

Characterization of Oxidation/ Reduction Potential (ORP)

BNSF collected groundwater samples in October 2009 to allow further characterization of a reducing environment, as required by the ROD. As discussed in the KRY Site Sawdust Investigation Report Rev 1, Kalispell, Montana dated April 2011 (AECOM 2011), groundwater samples were collected from existing wells in the northwestern portion of the KRY Site (KRY-103A, KRY-100A, KRY-105A, and KRY-101A), and samples were collected from the drill stem from boring locations VP-1-09, VP-2-09, VP-3-09, and VP-4-09 using screened point samplers. All groundwater samples were analyzed for dissolved methane, total iron and manganese, and dissolved iron and manganese as well as the following field parameters: temperature, pH, specific conductivity, dissolved oxygen (DO), and ORP. Methane concentrations ranged from not-detected to 287 µg/L in well KRY-103A. Dissolved iron exceeded SSCLs for groundwater

in vapor points VP-1-09 and VP-3-09, well KRY-100A, and in well KRY-103A. Dissolved manganese exceeded SSCLs in vapor point VP-3-09 and in wells KRY-100A and KRY-103A. Field parameter measurements of DO and ORP generally show reducing conditions in this area of the site with low DO measurements and negative ORP measurements. Vapor points VP-1-09 and VP-2-09, and well KRY-105A exhibit the least reducing conditions on site with positive ORP measurements. A data summary table and figure identifying well locations are provided in Appendix C.

BNSF conducted additional groundwater sampling during the semi-annual sampling event in October 2011, as reported in the October 2011 Groundwater Monitoring Report KRY Site – Kalispell, Montana dated January 2012 (AECOM 2012b). BNSF sampled seven wells throughout the KRY Site (both eastern and western portions) for total and dissolved iron, as well as total and dissolved manganese. Total iron and manganese concentrations were consistently highest on the western portion of the site in and adjacent to the sawdust area, as were dissolved manganese concentrations. Dissolved iron was not detected in any well. Two other areas of the KRY Site (outside of the identified sawdust area) had elevated total iron or total/dissolved manganese concentrations, but these areas are in or adjacent to areas of identified free product plumes. Data is identified in Appendix E.

3.2.2 Determination That Buried Sawdust Can Be Left In Place

After evaluation of the additional information on the reduction/oxidation potential and soil gas in the sawdust area, DEQ has determined that, as a result of the degradation of the buried sawdust material, reduced conditions and high levels of methane in soil vapor are present. Based upon the results of the sampling, DEQ has determined that the sawdust can remain in place provided that the following actions occur:

<u>Placement of Institutional Controls (ICs)</u>

ICs in the form of groundwater use restrictions and land use restrictions were identified as site-wide elements in the ROD. The ROD requires land use restrictions in the form of restrictive covenants prohibiting residential use and a prohibition on groundwater use until DEQ determines they are no longer needed to ensure protection of human health. However, DEQ requires additional restrictive covenants for the sawdust area to prohibit building construction over the sawdust area and to limit excavation in the sawdust area due to the high methane concentrations in soil vapor. DEQ recognizes that utility trenches and paved roads with sand or gravel sub-base can be gas migration pathways. However, as shown on Figure 1-2 of the *Work Plan for Methane Investigation* (see Appendix B), there are no underground utilities or other conduits for methane migration (paved roads with sub-base or other below ground conduits) within the sawdust area (AECOM 2011a). The additional restrictive covenants will also ensure that these utilities or other conduits are not installed in this area. It is unlikely that buildings could be erected on top of the buried sawdust regardless of the restrictive covenants due to the lack of structural integrity associated with the sawdust; therefore, the sawdust area would not be a desirable building location.

Long-Term Monitoring

The ROD identified long-term monitoring during remedy construction and long-term operation and maintenance as a site-wide element.

- Groundwater: For the sawdust area, DEQ requires that existing monitoring wells in the vicinity of the sawdust area and any newly constructed wells be included in the long-term groundwater monitoring plan and sampled for metals. Existing industrial use wells serving the Glacier Stone property must also be included in the long-term monitoring plan and sampled for metals as these wells supply water to the buildings currently used, including restrooms, and have the potential to be used for drinking water.

- Soil Gas and Indoor Air: For the sawdust area, DEQ requires that existing soil gas points and, to the extent necessary soil gas points were removed as a result of construction activities, newly installed soil gas points, be included in the long-term monitoring plan. The soil gas points will be sampled for methane, carbon dioxide, and oxygen using a hand held gas meter. For the buildings closest to the sawdust area (previously identified as a large warehouse and a small scale house), DEQ requires indoor air monitoring with a handheld gas meter be included in the long-term monitoring plan. Soil gas monitoring will help determine the progress of sawdust degradation and, once concentrations begin to steadily decline, may indicate when the coordinated indoor air monitoring may be reduced or discontinued. Certain regulations from the Montana Solid Waste Act can be used to evaluate the results of indoor air monitoring. Specifically, ARM 17.50.1106 specifies the concentration of methane gas generated by a solid waste facility cannot exceed 25 percent of the LEL for methane in facility structures, excluding gas control or recovery system components. While the buried sawdust may not constitute a solid waste management facility, the buried sawdust is considered "solid waste" under § 75-10-203(11)(a), MCA. Therefore, ARM 17.50.1106 is considered a relevant ERCL, consistent with § 75-10-721, MCA, which must be considered when evaluating the results of the indoor air monitoring of the methane.

The degradation of the buried sawdust material that is producing the methane soil vapor and creating chemical conditions, which allow metals to be removed from the soil, and then become dissolved in groundwater, will naturally decrease through time. Placement of ICs and air monitoring for methane, as discussed above will ensure current and future protection of onsite workers and other potential receptors. Regular sampling as part of the long-term monitoring program will measure the decline in the methane concentrations in soil vapor and in metals concentrations in groundwater at the KRY Site. As described in the ROD, should detections of contaminants occur in drinking water wells at levels at or in excess of SSCLs, DEQ will require immediate resampling of the well. Should the initial detected concentration be verified, DEQ will require immediate connection of the residence or business to the public water supply provided through the Evergreen Water District.

No additional or different alternatives analysis is necessary for this remedy to address the buried sawdust as ICs and long term monitoring were already identified in the ROD. Land uses are not expected to change as a consequence of the determination to leave the sawdust in place. Land use is expected to remain industrial and commercial in the northwestern portion of the KRY Site.

Institutional controls in the form of restrictive covenants will ensure that the sawdust area is restricted to commercial/industrial use and to preclude the construction of buildings or placement of utilities within the sawdust area (which is likely to be unsuitable for building construction in any case). Groundwater use will be restricted by institutional controls described in the ROD and these restrictions will remain in effect until SSCLs are achieved, which will minimize migration of contaminated groundwater that could occur by pumping adjacent or nearby groundwater. After groundwater SSCLs are achieved, groundwater will again be available for unrestricted use. The timeframe for achieving groundwater SSCLs throughout the plume is uncertain but these levels are expected to be met within 50 years, and DEQ's determination that the buried sawdust can remain in place does not change this estimate.

3.3 CORRELATION-BASED CLEANUP LEVEL FOR PCP IN SUBSURFACE SOILS

The ROD (Section 7.1.1.2.1) identified use of the SPLP (also known as EPA Method 1312) as an alternate approach for determining compliance with remediation goals for contaminants with a leaching to groundwater risk. As stated in the ROD (DEQ 2008), "once the site-specific human health cleanup levels and land disposal restriction (LDR) requirements are met, DEQ will allow the option of collecting an appropriate number of samples to have analyzed for SPLP in order to determine a leachate concentration. If the samples demonstrate that leachate concentrations do not pose a leaching to groundwater risk when compared to the appropriate groundwater cleanup level with a site-specific dilution attenuation factor (DAF) of 30 (DEQ 2008c), then DEQ will allow the soil to be removed from the LTU even if the leaching to groundwater cleanup level has not been met."

3.3.1 Development of a Total PCP versus SPLP PCP Correlation

BNSF developed a total PCP versus SPLP PCP correlation for subsurface soils at the KRY Site in 2012 in order to arrive at a total PCP concentration that was representative of the SPLP-based leaching to groundwater criteria of 30 µg/L (which is the 1 ug/L groundwater standard for PCP with the site-specific DAF of 30 applied). The details of the sampling and development of the correlation are provided in Memorandum: Results of KRY Site Sample Collection for Total PCP/SPLP PCP Correlation Revision 1 dated July 2012 (AECOM 2012). The subsurface soil investigation consisted of 30 samples (plus three duplicates) collected from various depths within nine test pits. BNSF performed soil sieving to remove cobbles and gravel from the samples and to homogenize the soil. All samples were analyzed for total PCP by EPA Method 8270D and SPLP PCP by EPA Method 1312 (both slightly modified as described in the DEQ-approved work plan). Samples also were analyzed for total organic carbon, grain size analysis, soil pH, cation exchange capacity, and alkalinity. See Appendix F for a summary of the results.

BNSF's evaluation of the correlation between total and SPLP PCP was conducted using only the samples where PCP was detected both in the total analysis and the SPLP analysis (see Appendix F for a summary of the dual detect data). None of the information about additional parameters sampled (pH, cation exchange capacity (CEC), total organic carbon (TOC), grain size, etc.) was used, because these parameters were not shown to have a significant and consistent influence on the PCP concentrations. BNSF completed a statistical analysis of the data with the software

package Stata. The relationship between the total PCP and SPLP PCP dual detection results and the calculated 95% confidence intervals around the regression (displayed as the gray region) are shown in Appendix F. The final correlated total PCP cleanup level for subsurface soil is 6.8 mg/kg (AECOM 2012).

3.3.2 Application of the Correlation-Based Cleanup Level

This ESD incorporates the correlation-based leaching to groundwater SSCL for PCP in subsurface soil in place of the ROD identified SPLP leachate-based approach. The correlation-based SSCL was calculated after collection and analysis of subsurface soil samples for total and SPLP PCP.

The final correlated subsurface soil total PCP SSCL negates the need for use of the SPLP-based approach for PCP. Therefore, DEQ will allow the use of this correlated SSCL of 6.8 mg/kg in place of the modeled leaching-based SSCL for PCP in subsurface soils of 0.43 mg/kg for all remedial design documents and associated assumptions. A correlation-based SSCL was not calculated for surface soils; therefore, the modeled leaching-based PCP surface soil SSCL of 12 mg/kg will continue to be used. However, the correlated total PCP SSCL for subsurface soil may be used in place of the leaching to groundwater-based SSCL for PCP in surface soil identified in the ROD (12 mg/kg), as it would also be protective of leaching from surface soils.

No additional or different analysis is necessary for the correlation-based total PCP subsurface soil SSCL as the basis for the correlation, the SPLP approach, was already identified in the ROD. In addition, it is equally protective because the basis for the correlation, the SPLP approach, was already identified in the ROD. The development and approval of the correlation-based PCP subsurface soil SSCL resulted in a reduction in the size of the area of excavation, a reduction in the size of the PCP LTU, and will reduce the overall timeframe for operation of the LTU due to the reduced volume of soil (AECOM 2012). These in turn reduce the overall costs for remedy implementation and may lessen the impact to nearby property owners (AECOM 2012).

3.4 UPDATED TOXICITY INFORMATION FOR DIOXINS/FURANS

This ESD incorporates EPA's updated toxicity information for evaluation of the non-carcinogenic health effects for dioxins/furans released after the ROD was issued.

In Section 7.1.2 (Evaluation of Uncertainties) of the ROD, DEQ identified that non-cancer health effects from dioxins/furans were not evaluated in the risk analysis because standard, non-cancer toxicity criteria for dioxins/furans were not currently available and the EPA dioxin reassessment, which outlines alternative approaches, had not yet been finalized. However, in February 2012, new non-carcinogenic toxicity information (an oral reference dose) was added to the Integrated Risk Information System (IRIS) database for dioxins/furans (EPA 2012a and IRIS 2013). This toxicity information allows for quantifiable calculation of non-cancer risk-based SSCLs for dioxins/furans.

Based on this information, it was necessary for DEQ to ensure that the SSCLs for dioxins/furans identified in the ROD are protective of human health. Therefore, DEQ calculated non-carcinogenic risk-based SSCLs for dioxin for each media for which it was identified as a COC: surface soil (residential exposure and commercial/industrial exposure), and subsurface soil (construction worker/excavation exposure). DEQ calculated these revised SSCLs after re-evaluation of the non-carcinogenic compounds in each media (surface and subsurface soil) to ensure that the total hazard index (ingestion or inhalation) for compounds with the same target organs or critical effects does not exceed one for any organ or effect. Since the critical effects for both ingestion and inhalation of dioxins/furans are not shared by any other identified COCs, the entire hazard quotient of one was applied to both the ingestion and inhalation exposures for dioxins/furans (EPA 2012a and CalEPA 2001). EPA has updated its approach for calculating inhalation risk since the ROD was issued and DEQ is incorporating this updated approach into the KRY Site SSCLs (EPA 2009a). In addition, EPA updated exposure factors in the October 2011 EPA Exposure Factors Handbook and DEQ is also incorporating these updated exposure factors into the KRY Site SSCLs (EPA 2011). Therefore, while DEQ utilized the same site-specific assumptions and general EPA equations as were previously used for calculating the non-carcinogenic dioxins/furans SSCLs in the ROD, there were some changes made to the overall approach to calculate the dioxins/furans SSCLs in accordance with current risk assessment approaches.

An evaluation of the newly calculated non-carcinogenic dioxins/furans SSCLs compared to the ROD SSCLs that were based solely on carcinogenic health effects, indicated that both the residential and commercial/industrial surface soil carcinogenic SSCLs identified in the ROD are still protective of human health. However, the newly calculated dioxins/furans subsurface soil SSCL based upon non-carcinogenic health effects associated with the construction worker/excavation exposure are lower than the ROD carcinogenic SSCL level of 850 nanograms per kilogram (ng/kg). Therefore, the ROD SSCL is no longer protective of human health. As a result, DEQ has determined that the revised non-carcinogenic subsurface soil SSCL of 470 ng/kg will replace the ROD SSCL for subsurface soil to ensure protection of human health. The spreadsheet, including assumptions, used to calculate the non-carcinogenic subsurface soil dioxins/furans SSCL are included in Appendix G.

As described above, the approach used in calculating the revised dioxins/furans subsurface soil SSCL is the same as that used in the ROD except for the use of the updated approach for calculating inhalation risk and exposure factors and the new non-carcinogenic toxicity information. The development of the revised subsurface SSCL for dioxins/furans has some impact on the overall remedy implementation since much of the excavation of dioxins/furans-contaminated soils was conducted in the first field season of remedy implementation. As a result, many confirmation samples have already been collected, compared to the ROD subsurface soil SSCL for dioxins/furans, and ultimately approved by DEQ. With this revised SSCL, DEQ asked BNSF to reevaluate confirmation samples associated with recent cleanup work and historical samples used to determine the extent of dioxins/furans contamination to determine if there were areas that exceed the revised SSCL. As a result of this evaluation, DEQ has determined that two individual samples associated with one excavation area contain concentrations of dioxins/furans that are no longer protective of human health (BNSF, 2013). For most excavation areas, BNSF collected a minimum of 10 dioxins/furans samples to allow the

calculation of a 95% upper confidence limit (UCL), if necessary, which was then compared to the SSCLs. In most cases, the UCL was not calculated because all of the individual samples met the ROD SSCLs. However, for some excavation areas where individual samples exceeded the ROD SSCLs, a 95% UCL was calculated and so long as the 95% UCL was below the ROD SSCLs, DEQ was able to approve the samples and determine excavation was complete for that excavation area. For Area 34C (see figures in Appendix H), two individual samples exceeded the ROD SSCLs, but the 95% UCL did not. However, the 95% UCL for Area 34C does exceed the revised dioxins/furans subsurface soil SSCL, and therefore the two individual samples with exceedances were identified in this reevaluation. Both of the samples exceeding the revised SSCL are associated with one sidewall of Area 34C, and both locations are beneath or within the sidewall/berm of the PCP LTU that was constructed in the first construction season.

Since the two locations identified as having exceedances of the revised SSCL are located within the engineered PCP LTU, they will not be accessible to any receptors until the LTU is removed at the completion of all soil treatment activities. Additionally, each lift of soil from the comingled PCP and dioxins/furans cell of the PCP LTU may need to be placed into the dioxins/furans repository due to the likelihood of remaining post-treatment exceedances of dioxins/furans SSCLs. BNSF's remedial design for ROD implementation already identified the need for a temporary repository cap until such time as all soils were treated in the LTU. Consistent with that previous remedial design, BNSF and DEQ identified two options for addressing these identified exceedances of the revised SSCL once the PCP LTU is closed: excavation and consolidation in the dioxins/furans repository, and extension of the currently designed dioxins/furans repository cap to cover the identified exceedances. Both options will mitigate the overall risk to human health and the environment associated with the contaminated soils and both are consistent with the overall remedy selected in the ROD. BNSF provided cost estimates for the two options which indicate that the identified increased cost of Option 1: Additional Excavation and Consolidation in the Repository is approximately $51,000 (BNSF 2013). BNSF identified the increased cost of Option 2: Expansion of the Repository Cover over Area 34C as approximately $17,500 (BNSF 2013). The area of expansion is approximately 0.06 acres in size and is located on BNSF's property. Detailed cost estimates associated with these two options are provided in Appendix H. Given the identified costs and the fact that either option is consistent with the ROD, DEQ has determined that extension of the repository cap slightly to the north of the currently designed location is appropriate to address the remaining dioxins/furans exceedances.

3.5 UPDATED TOXICITY EQUIVALENCE REFERENCE

This ESD incorporates an updated reference for the toxicity equivalence approach for dioxins/furans in groundwater to allow consistency in application of the approach for soil and groundwater.

When the ROD was issued in 2008, the DEQ-7 standards document (DEQ, 2006) used the World Health Organization (WHO) 1998 toxicity equivalence factors (TEFs) when calculating a toxicity equivalence quotient (TEQ) for dioxins/furans in groundwater. However, updated WHO

TEFs from 2005 were available and the ROD required use of those TEFs for calculating the dioxins/furans TEQ in soil.

In December 2010, EPA released its document Recommended Toxicity Equivalence Factors (TEFs) for Human Health Risk Assessments of 2,3,7,8-Tetrachlorodibenzo-p-dioxin and Dioxin-Like Compounds, which specified that the WHO 2005 TEFs be used for human health risk assessments (EPA 2010). Therefore, DEQ requires that the WHO 2005 TEFs be used for calculating the dioxins/furans TEQ for both soil and groundwater at the KRY Site.

There is no impact to the implementation or outcomes of the remedy as a result of this change as it merely revises the TEFs used in calculating the dioxins/furans TEQ for water samples to be consistent with those used in calculating the TEQ for soil samples. It does not change the SSCLs or the manner in which the remedy must be implemented.

4.0 PUBLIC PARTICIPATION

DEQ has determined that these changes to the ROD are significant but not fundamental. There are no changes in the scope of the remedy and the remedial components (offsite treatment versus onsite treatment, the use of institutional controls, and long-term monitoring) were already screened and evaluated in the ROD. Therefore, EPA's Guide indicates that public comment on this ESD is not necessary (EPA 1999). In addition, public comment is not required by CECRA. However, because of previous public interest in the KRY Site, DEQ published a notice of public comment on this ESD in the Kalispell Daily Interlake and on DEQ's website. DEQ also sent notice of the public comment period directly to the liable persons at the KRY Site and other interested parties. In addition, copies of the ESD were made publically available at the information repositories and on DEQ's website. Upon completion of the public comment period and receipt of comments, DEQ reviewed and considered all comments, compiled a responsiveness summary of public comments received, and made changes to the ESD in response to public comments as well as minor editorial changes to the ESD prior to issuing the final ESD. Copies of the responsiveness summary document are publically available at the information repositories and on DEQ's website. The administrative record that contains all of the documents related to the selection of the final remedy for the KRY Site (see Section 14.0 of the ROD), including those noted in Section 6 of this ESD, is located at:

Montana Department of Environmental Quality
Remediation Division
Hazardous Waste Site Cleanup Bureau
1100 North Last Chance Gulch
Helena, MT 59601
Telephone: (406) 841-5000

A partial compilation of the administrative record can be found on DEQ's website at http://deq.mt.gov/StateSuperfund/kpt.mcpx and at:

Flathead County Library
247 1st Avenue East
Kalispell, MT 59901
Telephone: (406) 758-5820

5.0 ADMINISTRATIVE RECORD REFERENCES

DEQ cited, relied upon, or considered the following documents in developing this ESD. It does not include legal citations such as those found in the MCA, ARM, United States Code, and Code of Federal Regulations (CFR). In addition, references identified in the ROD (DEQ 2008) are incorporated herein as part of this ESD administrative record.

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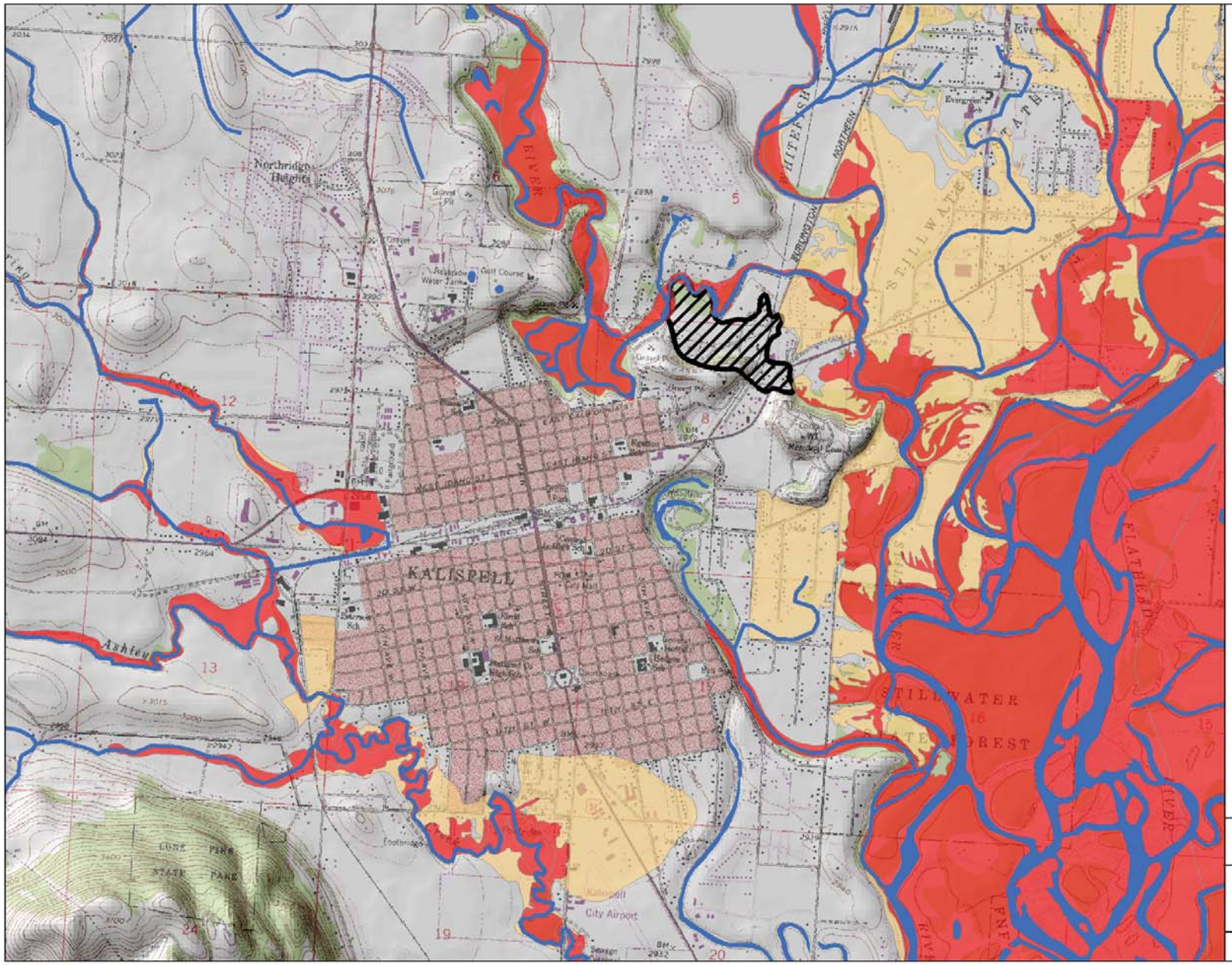
FIGURES



N

Legend

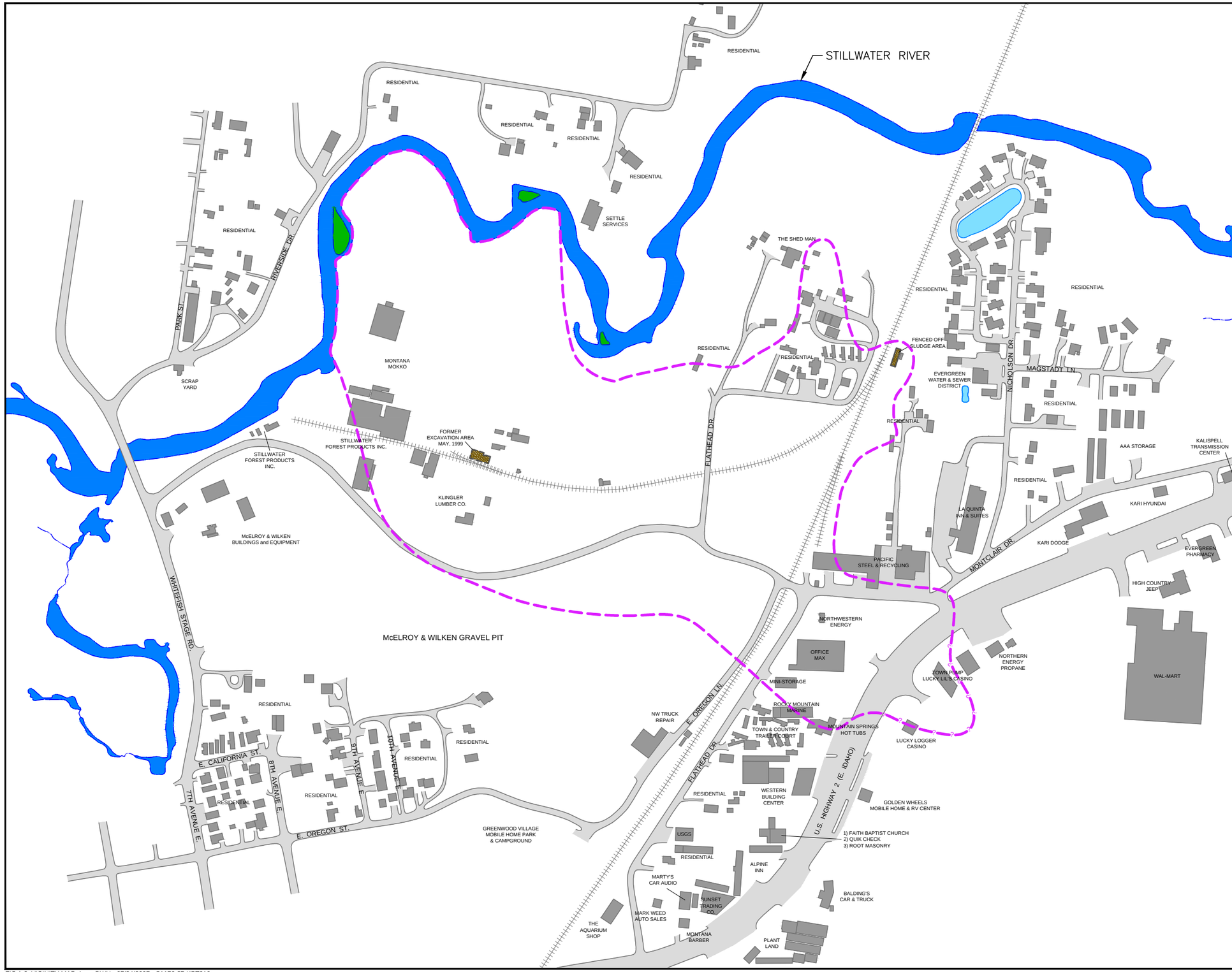
- Approximate Facility Boundary
- FEMA Mapped Floodplains
  - 100 Year Floodplain
  - 500 Year Floodplain

Source:
Floodplains from Federal Emergency Management Agency DFIRM GIS data, 2007.

0 1,000 2,000 3,000 4,000 5,000 Feet

KALISPELL POLE & TIMBER, RELIANCE, and YALE OIL FACILITIES
KALISPELL, MONTANA

FIGURE 1
SITE LOCATION MAP



N

Legend

- Building
- Approximate KRY Site Boundary
- Pond
- River
- Island
- Road
- Railroad

Note:
Base Figure From DEQ/TtEMI RI,
Modified by Trihydro Corporation.

Source:
NRIS and USGS Aerial Photo-Kalispell Area (2004)
Photo-Kalispell Area (2004)
USDA FSA NAIP Aerial Photo-Kalispell Area (2005)

400 0 400 Feet

KRY SITE
KALISPELL, MONTANA

FIGURE 2
VICINITY MAP

FIG 1-2_VICINITY MAP.dwg - DWH - 07/24/2007 - S1176-37-KPT010

APPENDIX A

PROJECT:	**KRY HC OFF-SITE DISPOSAL**	ESTIMATOR: **TMK**		SHT 1 OF	**SHT 11**
JOB NO.:	**60147138**				
CLIENT:	**BNSF**			TEMPLATE RELEASE	3.00
LOCATION:	**KALISPELL, MT**	DATE: 12-Mar-13	TIME: 03:54 PM	DATED	0-Jan-00

ESTIMATE SUMMARY - CAPITAL COSTS

ITEM DESCRIPTION	DETAIL SHEET	BIDFORM QUANTITY	UNIT	LABOR	INT. EQUIP	EXT. EQUIP	FUEL	REPAIRS	SUPPLIES	MATERIAL	SUBS	TRAVEL	UNIT COSTS	TOTAL COSTS	UNIT PRICE	TOTAL PRICE
TOTAL FIXED OVERHEADS	SHT 6	1	LS	0	0	0	0	0	0		0	0	0.00	0	0.00	0
VARIABLE JOBSITE OVERHEADS	SHT 7	1	WEEKS	0	0	0	0	0	0		0	0	0.00	0	0.00	0
LOAD SOIL TO RAILCARS	SHT 8	8,300	BCY	66,727	0	26,919	14,700	3,450	24,966	0	0	0	16.48	136,762	19.77	164,091
RAIL TRANSPORT	SHT 9	167	CARS	0	0	0	0	0	0	370,832	0	0	2,220.55	370,832	2,220.55	370,832
SOIL DISPOSAL	SHT 10	8,300	BCY	0	0	0	0	0	0	239,100	0	0	28.81	239,100	28.81	239,123
IMPORT AND PLACE CLEAN BACKFILL	SHT 11	15,000	TNS	19,769	0	16,725	10,080	1,760	138,150	0	0	0	12.43	186,484	14.97	224,550
SUBTOTAL				86,496	0	43,644	24,780	5,210	163,116	609,932	0	0		933,178		
WEATHER FACTOR USED IN CALCS =		5.00%		4,325	0	2,182			8,156			0		14,663		
TOTAL ESTIMATE				90,821	0	45,826	24,780	5,210	171,272	609,932	0	0		947,841		

947,841 <=== ESTIMATE CHECK

MARK-UP SUMMARY	COST	MARK-UP %'AGE	MARK-UP	TOTAL
LABOR	90,821	15.00%	13,623	104,444
INTERNAL EQUIPMENT	0	15.00%	0	0
EXTERNAL EQUIPMENT	45,826	15.00%	6,874	52,700
FUEL	24,780	15.00%	3,717	28,497
REPAIRS	5,210	15.00%	782	5,992
SUPPLIES	171,272	15.00%	25,691	196,963
TRAVEL	0	15.00%	0	0
MATERIALS	609,932	0.00%	0	609,932
SUBS	0	15.00%	0	0
BONDS	0	0.00%	0	0
TOTALS	947,841		50,686	998,528

0	<= SPEC. TAX	@	0.00%
0	<= BONDS	@	0.00%
0	<= SPEC. INS	@	0.00%

SUBTOTAL ESTIMATED PRICE		998,596
CONTINGENCY	0%	0
TOTAL ESTIMATE		998,596

AECOM.2013. Email regarding revised cost estimate for offsite transport/treatment of petroleum soils from the KRY site. From Ann Colpitts (AECOM) to Moriah Bucy (DEQ). March 13.

PROJECT:	**KRY HC OFF-SITE DISPOSAL**	DATE:	12-Mar-13	**SHT 2 OF SHT 11**
JOB NO.:	**60147138**			
CLIENT:	**BNSF**	TIME:	03:55 PM	
LOCATION:	**KALISPELL, MT**			
		ESTIMATOR:	**TMK**	

ESTIMATOR NOTES:

Estimate for off-site disposal of the hydrocarbon impacted soil exceeding regulatory limits at the Gascoyne facility in North Dakota.
This is an incremental estimate for comparison to on-site treatment of hydrocarbon impacted soil therefore common tasks such as excavation, jobsite supervision, etc. are not included.
Assumes no difference in duration for the overall project as a result of constructing the hydrocarbon LTU or off-site disposal.
Rail transport costs and disposal costs have been included as a Material with no markup by a contractor assuming direct pay by the Owner
No contingency has been added to this estimate since it is for comparative purposes only

PROJECT:	**KRY HC OFF-SITE DISPOSAL**	DATE:	12-Mar-13	**SHT 3a OF**	**SHT 11**
JOB NO.:	**60147138**				
CLIENT:	**BNSF**	TIME:	03:55 PM		
LOCATION:	**KALISPELL, MT**				

WEEKLY WORK HOUR BASIS: ESTIMATOR: TMK

1) PROJECT BASED ON WORKING 60 HOURS PER WEEK.
2) RATES ARE BASED ON LABOR RATES FROM MEANS

SUBSISTENCE AND TRAVEL COST CALCULATIONS: **AMOUNTS APPLIED TO THE FIRST 40 HOURS OF WORK**

S&T CLASS	GENERAL DESCRIPITON	TRAVEL BASIS (WKS/TRP)	TRAVEL COST (PER TRIP)	LODGING COST (PER NIGHT)	SUBSISTENCE COST (PER WEEK)	HOURLY COSTS TRAVEL	LODGING	SUBSISTENCE	TOTALS
FULL TIME PERSONNEL:									
S1	TRAVEL BY AIR	3	$500	$80.00	$210	$4.17	$12.67	$5.25	$22.09
S2	TRAVEL BY AUTO (DISTANT)	3	$200	$80.00	$210	$1.67	$12.67	$5.25	$19.59
S3	TRAVEL BY AUTO (LOCAL)	3				$0.00	$0.00	$0.00	$0.00
S4						#DIV/0!	#DIV/0!	$0.00	#DIV/0!
S5						#DIV/0!	#DIV/0!	$0.00	#DIV/0!
SITE HIRE PERSONNEL:									
H1	TRAVEL BY AIR	1	$0	$0.00	$0	$0.00	$0.00	$0.00	$0.00
H2	TRAVEL BY AUTO (DISTANT)	1	$0	$0.00	$0	$0.00	$0.00	$0.00	$0.00
H3	TRAVEL BY AUTO (LOCAL)	1				$0.00	$0.00	$0.00	$0.00
H4						#DIV/0!	#DIV/0!	$0.00	#DIV/0!
H5						#DIV/0!	#DIV/0!	$0.00	#DIV/0!

TAX AND INSURANCE CALCULATIONS:

	DESCRIPTION	LOCAL HOURLY	CORE HOURLY	UNION HOURLY	SERVICES SALARIED	CONSTRUCTION SALARIED	REMARKS
*	Federal Unemployment Tax %	0.16%	0.16%	0.16%	0.13%	0.07%	= Average Federal Unemployment Tax Rate applied to all wages paid.
*	State Unemployment Tax %	1.12%	1.09%	1.37%	0.95%	0.66%	= Average State Unemployment Tax Rate applied to all wages paid.
*	FICA %	8.70%	8.70%	8.70%	7.40%	6.50%	= Average Social Security Tax applied to all wages paid.
	Workmans Compensation %	26.60%	26.60%	26.60%	26.60%	26.60%	= Average Workmen's Compensation Rate for all states.
	PTO / Holidays %	0.00%	4.76%	8.67%	9.70%	11.37%	= Average rate applied to base wage to cover vacation/holiday costs.
	Medical Insurance %	0.00%	5.41%	0.00%	6.62%	4.94%	= Average rate applied to base wage to cover hospitalization, disability, and life insurance costs.
	401 (k) %	0.00%	0.28%	0.00%	0.57%	0.66%	= Corporate Match for 401(k)
	Union H & W (Services Union only	0.00%	0.00%	20.57%	0.00%	0.00%	= Health and Welfare for Internal Union. TO BE USED ON SERVICES PROJECTS ONLY.
	STRAIGHT %	36.58%	47.00%	66.07%	51.97%	50.80%	= Total burden applied to all straight time wages paid.
*	OVERTIME %	9.98%	9.95%	10.23%	8.48%	7.23%	= Total burden applied to all overtime wages paid.
	PAYROLL BURDEN DESIGNATION TO INSERT ON SHEET 3b, COLUMN J.	**LH**	**CH**	**UH**	**SS**	**CS**	

PROJECT: **KRY HC OFF-SITE DISPOSAL** DATE: 12-Mar-13 **SHT 3b OF** **SHT 11**
JOB NO.: **60147138**
CLIENT: **BNSF** TIME: 03:55 PM
LOCATION: **KALISPELL, MT**
ESTIMATOR: TMK

Caution: If any of the Descriptions listed in Column B are changed on this sheet, those identical changes MUST be made on Sheet 7 as applicable. If this is not done, when attempting to "Calculate" the estimate, a "Circular Reference" message will be received.

Labor Location: Missoula, MT Location Factor: 0.963

WAGE RATE TABLE

	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R
	ESCAL			<==FRINGES==>		<===BURDEN CALCULATION===>			<==OTHER ADD ONS==>		STRAIGHT HOURLY		PREMIUM HOURLY		AVG HOURLY	@ 60 HRS
	FACTOR	SUB & TRVL	BASE	TAXABLE	NON-TAXABLE	BURDEN	ST BURDEN	OT BURDEN		SUB &	BARE	TOTAL	BARE	TOTAL	BARE	TOTAL
DESCRIPTION	MULTIPLIER	CLASS	WAGE	VACATION	OTHER	DESIGNATION	%	%		TRAVEL	HOURLY	HOURLY	HOURLY	HOURLY	HOURLY	HOURLY
******* LOCAL HOURLY*******																
70 FIELD FORMAN (L)	1.00	H1	$33.80			LH	36.58%	9.98%		$0.00	$33.80	$46.17	$50.70	$64.75	$39.43	$52.36
71 LIGHT OPERATOR (L)	1.00	H1	$39.77			LH	36.58%	9.98%		$0.00	$39.77	$54.32	$59.66	$76.19	$46.40	$61.61
72 MEDIUM OPERATOR (L)	1.00	H1	$41.36			LH	36.58%	9.98%		$0.00	$41.36	$56.49	$62.04	$79.23	$48.25	$64.07
73 HEAVY OPERATOR (L)	1.00	H1	$42.76			LH	36.58%	9.98%		$0.00	$42.76	$58.40	$64.14	$81.91	$49.88	$66.24
74 TRUCK DRIVER (L)	1.00	H1	$31.92			LH	36.58%	9.98%		$0.00	$31.92	$43.60	$47.89	$61.16	$37.24	$49.45
75 COMMON LABORER (L)	1.00	H1	$31.88			LH	36.58%	9.98%		$0.00	$31.88	$43.54	$47.81	$61.06	$37.19	$49.38
76 SKILLED WORKER (L)	1.00	H1	$41.02			LH	36.58%	9.98%		$0.00	$41.02	$56.03	$61.54	$78.59	$47.86	$63.55
77 MECHANIC(L)	1.00	H1	$41.36			LH	36.58%	9.98%		$0.00	$41.36	$56.49	$62.04	$79.23	$48.25	$64.07
78 OILER (L)	1.00	H1	$36.88			LH	36.58%	9.98%		$0.00	$36.88	$50.37	$55.32	$70.66	$43.03	$57.14
79 CLERK (L)	1.00	H1	$9.51			LH	36.58%	9.98%		$0.00	$9.51	$12.99	$14.27	$18.23	$11.10	$14.74
80 ELECTRICIAN (L)	1.00	H1	$47.19			LH	36.58%	9.98%		$0.00	$47.19	$64.45	$70.78	$90.40	$55.05	$73.10
81 PIPE FITTER (L)	1.00	H1	$49.98			LH	36.58%	9.98%		$0.00	$49.98	$68.26	$74.97	$95.75	$58.31	$77.42
82 STRUCT STEEL WORKER (L)	1.00	H1	$45.16			LH	36.58%	9.98%		$0.00	$45.16	$61.69	$67.75	$86.52	$52.69	$69.96
83	1.00					LH	36.58%	9.98%		$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00
*******CORE HOURLY*******																
85 FIELD FOREMAN(C)	1.00					CH	47.00%	9.95%		$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00
86 MECHANIC(C)	1.00					CH	47.00%	9.95%		$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00
87 KEY OPERATOR	1.00					CH	47.00%	9.95%		$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00
88 KEY LABORER	1.00					CH	47.00%	9.95%		$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00
89 GRADE CHECKER (C)	1.00					CH	47.00%	9.95%		$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00
90	1.00					CH	47.00%	9.95%		$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00
*******SERVICES DIVISION UNION HOURLY*******																
92 FOREMAN (SU)	1.00					UH	66.07%	10.23%		$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00
93 EQUIPMENT OPERATOR (SU)	1.00					UH	66.07%	10.23%		$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00
94 LABORER (SU)	1.00					UH	66.07%	10.23%		$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00
95	1.00					UH	66.07%	10.23%		$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00
*******FULL TIME EXEMPT*******																
97 PROJECT MANAGER	1.00	S1	$48.15			CS	50.80%	7.23%		$22.09	$48.15	$94.70	$0.00	$0.00	$32.10	$63.13
98 SUPERINTENDENT	1.00	S1	$44.54			CS	50.80%	7.23%		$22.09	$44.54	$89.25	$0.00	$0.00	$29.69	$59.50
99 PROJ. ENGINEER	1.00	S1	$33.71			CS	50.80%	7.23%		$22.09	$33.71	$72.92	$0.00	$0.00	$22.47	$48.61
100 H&S OFFICER	1.00	S1	$27.78			CS	50.80%	7.23%		$22.09	$27.78	$63.99	$0.00	$0.00	$18.52	$42.66
101	1.00					CS	50.80%	7.23%		$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00
*******FULL TIME NON-EXEMPT*******																
103 AST. PROJ. ENG.	1.00	S1	$29.26			CS	50.80%	7.23%		$22.09	$29.26	$66.21	$29.26	$31.37	$29.26	$54.60
104 FIELD ENGINEER	1.00	S1	$29.26			CS	50.80%	7.23%		$22.09	$29.26	$66.21	$29.26	$31.37	$29.26	$54.60
105 ENGINEER TECH.	1.00	S1	$22.51			CS	50.80%	7.23%		$22.09	$22.51	$56.04	$22.51	$24.14	$22.51	$45.41
106 H&S TECHNICIAN	1.00	S1	$18.52			CS	50.80%	7.23%		$22.09	$18.52	$50.02	$18.52	$19.86	$18.52	$39.96
107	1.00					CS	50.80%	7.23%		$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00
*******CORE FULL TIME HOURLY*******																
109 OFFICE MANAGER (C)	1.00					CH	47.00%	9.95%		$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00
110 CLERK (C)	1.00					CH	47.00%	9.95%		$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00
111	1.00					CH	47.00%	9.95%		$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00

PROJECT: **KRY HC OFF-SITE DISPOSAL** DATE: 12-Mar-13 USE TAX RATE =======> 6.25% SHT 4 OF **SHT 11**
JOB NO.: **60147138** FINAL BUY ON EQUIPMENT ========> 0.00% **(NEGATIVE NUMBER)**
CLIENT: **BNSF** TIME: 03:55 PM
LOCATION: **KALISPELL, MT** LOCATION FACTOR: 0.988
ESTIMATOR: TMK HOURLY FUEL RATE IS BASED
UPON PAYING $3.50 PER GALLON.

EQUIPMENT RENTAL RATES

RENTAL RATE BASIS 176 HOURS PER MONTH
ESTIMATED EQUIPMENT USEAGE 176 HOURS PER MONTH
OVER-USE HOURS FACTOR 0.6 TIMES BASE RATE

EQUIPMENT ADJUSTMENT FACTORS:

DAILY	D	1.81
MONTHLY	M	1.00
WEEKLY	W	1.44

DESCRIPTION	TYPE		F MONTHLY RENTAL	G USE TAX PLUS FINAL BUY	H HOURLY RENTAL 176 HR/MO	I HOURLY FUEL RATE	J HOURLY REPAIRS RATE	K PERIOD USAGE D,W,M	L ADJUSTMENT FACTOR APPLIED
******** INTERNAL EQUIPMENT ********									
129				1.00	$0.00	$0.00	$0.00		0.00
130				1.00	$0.00	$0.00	$0.00		0.00
131				1.00	$0.00	$0.00	$0.00		0.00
******** EXTERNAL EQUIPMENT ********									
133 CAT D8 DOZER	DOZER	300 HP	$13,832	1.06	$83.50	$38.50	$10.00	M	1.00
134 CAT D6 DOZER	DOZER	185 HP	$9,534	1.06	$57.56	$21.00	$8.00	M	1.00
135 CAT D6LGP DOZER	LGP DOZER	185 HP	$11,918	1.06	$71.95	$21.00	$8.00	M	1.00
136 CAT D5 DOZER	DOZER	115 HP	$6,373	1.06	$38.47	$15.75	$6.00	M	1.00
137 CAT D5LGP DOZER	LGP DOZER	115 HP	$7,966	1.06	$48.09	$15.75	$6.00	M	1.00
138 CAT D4 DOZER	DOZER	80 HP	$3,335	1.06	$20.13	$12.25	$5.00	M	1.00
139 CAT 385 EXCAVATOR	EXCAVATOR	180,000 LB	$22,823	1.06	$137.78	$63.00	$17.00	M	1.00
140 CAT 345 EXCAVATOR	EXCAVATOR	100,000 LB	$14,030	1.06	$84.70	$38.85	$9.00	M	1.00
141 CAT 330 EXCAVATOR	EXCAVATOR	76,000 LB	$10,473	1.06	$63.22	$30.45	$6.00	M	1.00
142 CAT 325 EXCAVATOR	EXCAVATOR	60,000 LB	$8,324	1.06	$50.25	$24.85	$5.00	M	1.00
143 CAT 320 EXCAVATOR	EXCAVATOR	47,000 LB	$6,224	1.06	$37.58	$18.55	$4.50	M	1.00
144 CAT 315 EXCAVATOR	EXCAVATOR	37,000 LB	$5,558	1.06	$33.55	$12.25	$4.00	M	1.00
145 CAT 312B EXCAVATOR	EXCAVATOR	28,000 LB	$4,767	1.06	$28.78	$7.88	$3.50	M	1.00
146 CAT 385 EXC W/PRCESSR	EXCAVATOR WITH PROCESSOR		$34,234	1.06	$206.67	$63.00	$20.00	M	1.00
147 CAT 345 EXC W/LANG TOOL	EXCAVATOR WITH LANG TOOL		$25,000	1.06	$150.92	$38.85	$12.00	M	1.00
148 CAT 385 EXC W/BREAKER	EXCAVATOR WITH BREAKER		$29,344	1.06	$177.15	$63.00	$23.00	M	1.00
149 CAT 345 EXC W/BREAKER	EXCAVATOR WITH BREAKER		$20,550	1.06	$124.06	$38.85	$15.00	M	1.00
150 CAT 330 EXC W/BREAKER	EXCAVATOR WITH BREAKER		$14,104	1.06	$85.14	$30.45	$12.00	M	1.00
151 CAT 330 EXC W/THUMB	EXCAVATOR WITH THUMB		$12,597	1.06	$76.05	$30.45	$9.00	M	1.00
152 CAT 963 TRACK LOADER	TRACK LOADER	2.50 LCY	$9,263	1.06	$55.92	$21.00	$9.00	M	1.00
153 CAT 953 TRACK LOADER	TRACK LOADER	2.00 LCY	$7,435	1.06	$44.88	$19.25	$7.00	M	1.00
154 CAT 933 TRACK LOADER	TRACK LOADER	1.00 LCY	$3,582	1.06	$21.62	$12.25	$7.00	M	1.00
155 CAT 966 WHEEL LOADER	WHEEL LOADER	5.00 LCY	$8,052	1.06	$48.61	$26.25	$6.00	M	1.00
156 CAT 950 WHEEL LOADER	WHEEL LOADER	4.00 LCY	$5,064	1.06	$30.57	$19.25	$5.00	M	1.00
157 CAT 924 WHEEL LOADER	WHEEL LOADER	2.50 LCY	$3,335	1.06	$20.13	$10.50	$5.00	M	1.00
158 CAT 657E SCRAPER	SCRAPER TANDE ıl PWR	44.00 LCY	$32,308	1.06	$195.04	$115.50	$13.00	M	1.00
159 CAT 627G SCRAPER	SCRAPER TANDE ıl PWR	22.00 LCY	$15,018	1.06	$90.66	$64.75	$11.00	M	1.00
160 CAT 623G SCRAPER	SCRAPER ELEVATING	23.00 LCY	$18,871	1.06	$113.92	$42.00	$10.00	M	1.00
161 CAT 613C SCRAPER	SCRAPER ELEVATING	11.00 LCY	$9,658	1.06	$58.30	$22.75	$9.00	M	1.00
162 WATER WAGON OH	WATER TANKER	6,000 GAL	$7,163	1.06	$43.24	$24.50	$8.00	M	1.00
163 CAT 16H GRADER	MOTOR GRADER	285 HP	$12,350	1.06	$74.56	$29.75	$6.00	M	1.00
164 CAT 14H GRADER	MOTOR GRADER	220 HP	$9,238	1.06	$55.77	$24.50	$5.00	M	1.00
165 CAT 140H GRADER	MOTOR GRADER	185 HP	$4,866	1.06	$29.38	$17.50	$4.00	M	1.00
166 CAT 120H GRADER	MOTOR GRADER	140 HP	$4,199	1.06	$25.35	$15.75	$3.00	M	1.00
167 CAT 740 OH TRUCK	ARTICULATED TRUCK	42 TON	$14,524	1.06	$87.68	$30.10	$7.00	M	1.00
168 CAT 730 OH TRUCK	ARTICULATED TRUCK	32 TON	$10,374	1.06	$62.63	$21.35	$6.00	M	1.00
169 CAT 725 OH TRUCK	ARTICULATED TRUCK	26 TON	$11,856	1.06	$71.57	$19.25	$5.00	M	1.00
170 CAT 824G COMPACTOR	SOIL COMPACTOR	63,000 LB	$12,548	1.06	$75.75	$52.50	$7.00	M	1.00
171 CAT 814F COMPACTOR	SOIL COMPACTOR	48,000 LB	$10,176	1.06	$61.43	$28.00	$5.00	M	1.00
172 CAT CS531D COMPACTOR	VIBRATORY ROLLER	84 INCH	$5,829	1.06	$35.19	$14.00	$3.00	M	1.00
173 CAT CS433E COMPACTOR	VIBRATORY ROLLER	50 INCH	$4,915	1.06	$29.67	$15.75	$2.50	M	1.00
174 TRENCH COMPACTOR	TRENCH COMPACTOR	24 INCH	$1,482	1.06	$8.95	$7.00	$1.00	M	1.00
175 CAT 446B BACKHOE	BACKHOE LOADER	20,000 LB	$4,644	1.06	$28.03	$14.00	$5.00	M	1.00

176	CAT 428D BACKHOE	BACKHOE LOADER		17,000 LB	$2,841	1.06	$17.15	$10.50	$4.00	M	1.00
177	CAT 416D BACKHOE	BACKHOE LOADER		15,000 LB	$2,594	1.06	$15.66	$10.50	$2.00	M	1.00
178	CAT 246 SKID STEER LOADER	1/2 CY	72 INCH	80 HP	$2,050	1.06	$12.38	$8.40	$4.00	M	1.00
179	CAT 216 SKID STEER LOADER	1/3 CY	66 INCH	50 HP	$1,284	1.06	$7.75	$5.95	$3.00	M	1.00
180	CAT CT18 HYDRO HAMMER	2000 FT-LB SKID STEE R ATTACHMENT			$1,581	1.06	$9.54	$0.00	$2.00	M	1.00
181	TRACTOR TRAILER	FLAT BED			$2,470	1.06	$14.91	$14.00	$3.00	M	1.00
182	CRANE, LATICE BOOM 80'	CRAWLER MOUNTED		350 TON	$36,161	1.06	$218.30	$17.50	$18.00	M	1.00
183	CRANE, LATICE BOOM 70'	CRAWLER MOUNTED		200 TON	$23,712	1.06	$143.15	$15.75	$14.00	M	1.00
184	CRANE, LATICE BOOM 60'	CRAWLER MOUNTED		100 TON	$18,772	1.06	$113.33	$14.00	$12.00	M	1.00
185	CRANE, HYDRAULIC 150 TN	TRUCK MOUNTED		150 TON	$19,958	1.06	$120.48	$14.00	$16.00	M	1.00
186	CRANE, HYDRAULIC 100 TN	TRUCK MOUNTED		100 TON	$13,634	1.06	$82.31	$10.50	$13.00	M	1.00
187	CRANE, HYDRAULIC 40 TN	TRUCK MOUNTED		40 TON	$7,138	1.06	$43.09	$8.75	$10.00	M	1.00
188	PORTABLE WATER TOWER			10,000 GAL	$1,803	1.06	$10.89	$0.00	$1.00	M	1.00
189	TANDEM DUMP TRUCK 16 TN			16 TON	$2,865	1.06	$17.30	$14.00	$2.00	M	1.00
190	TANDEM DUMP TRUCK 25 TN			25 TON	$4,174	1.06	$25.20	$15.75	$3.00	M	1.00
191	PICKUP TRUCK				$637	1.06	$3.85	$5.25	$1.00	M	1.00
192	LOWBOY TRUCK			75 TON	$1,976	1.06	$11.93	$17.50	$2.00	M	1.00
193	VAC TANKER TRUCK			5,000 GAL	$3,829	1.06	$23.11	$10.50	$5.00	M	1.00
194	AERIAL LIFT TRUCK			80 FT BOOM	$6,546	1.06	$39.51	$5.25	$1.00	M	1.00
195	TELESCOPIC BOOMLIFT 60 FT			60 FT BOOM	$4,347	1.06	$26.24	$5.25	$1.00	M	1.00
196	TELESCOPIC BOOMLIFT 40 FT			40 FT BOOM	$2,865	1.06	$17.30	$5.25	$1.00	M	1.00
197	BOOM FORKLIFT, 8000 LB			16 FT	$3,952	1.06	$23.86	$7.00	$2.00	M	1.00
198	TRACTOR W/ROME OFFSET DISC			14 FT WIDTH	$2,000	1.06	$12.07	$0.00	$1.00	M	1.00
199	ROLL OFF BOX				$741	1.06	$4.47	$0.00	$0.00	M	1.00
200	AIR COMPRESSOR 750 CFM			750 CFM	$2,100	1.06	$12.67	$14.00	$4.00	M	1.00
201	AIR COMPRESSOR 450 CFM			450 CFM	$1,457	1.06	$8.80	$10.50	$3.00	M	1.00
202	AIR COMPRESSOR 250 CFM			250 CFM	$934	1.06	$5.64	$7.00	$2.00	M	1.00
203	LIGHT TOWER W/GEN			4000 WATT	$874	1.06	$5.28	$10.50	$1.00	M	1.00
204	100 KW GENERATOR, DIESEL			100 KW	$1,161	1.06	$7.01	$17.50	$3.00	M	1.00
205	20 KW GENERATOR, DIESEL			20 KW	$667	1.06	$4.03	$7.00	$2.00	M	1.00
206	5 KW GENERATOR, GASOLINE			5 KW	$136	1.06	$0.82	$3.50	$1.00	M	1.00
207	6" TRASH PUMP		1,500 GP ıl MAX		$1,581	1.06	$9.54	$14.00	$3.00	M	1.00
208	3" TRASH PUMP		250 GPM MAX		$474	1.06	$2.86	$10.50	$2.00	M	1.00
209	2" TRASH PUMP		130 GPM MAX		$459	1.06	$2.77	$7.00	$1.00	M	1.00
210	STEAM CLEANER				$563	1.06	$3.40	$3.50	$1.00	M	1.00
211	BAKER TANK RENTAL			20,000 GAL	$988	1.06	$5.96	$0.00	$0.00	M	1.00
212	OXY & ACET CUTTING TORCH				$222	1.06	$1.34	$0.00	$1.00	M	1.00
213	WATER TRUCK			5,000 GAL	$4,644	1.06	$28.03	$3.50	$3.00	M	1.00
214	FLAT BED TRUCK				$1,136	1.06	$6.86	$14.00	$3.00	M	1.00
215	CHIPPER			600 HP	$3,977	1.06	$24.01	$59.50	$4.00	M	1.00
216	ROCK CRUSHING UNIT			250 HP	$17,000	1.06	$102.63	$24.50	$5.00	M	1.00
217	TRACTOR W/ BRUSH HOG				$500	1.06	$3.02	$0.00	$6.00	M	1.00
218	WATER TANK			10,000 GAL	$400	1.06	$2.41	$0.00	$1.00	M	1.00
219											

PROJECT: **KRY HC OFF-SITE DISPOSAL**
JOB NO.: **60147138**
CLIENT: **BNSF**
LOCATION: **KALISPELL, MT**

DATE: 12-Mar-13
TIME: 03:56 PM
ESTIMATOR: **TMK**

SHT 5 OF SHT 11

SALES TAX RATE ON MAT'LS=======> 6.25%
SALES TAX RATE ON SUPPLIES=====> 6.25%
FINAL BUY ON MATERIALS==========> 0.00% **(NEGATIVE NUMBER)**
FINAL BUY ON SUBS================> 0.00% **(NEGATIVE NUMBER)**

SUMMARY OF MATERIAL AND SUBCONTRACT PRICES USED IN CURRENT ESTIMATE

B	E	F	G	H	I	J	L	N	O
DESCRIPTION	QUANTITY	UNIT	QUOTED UNIT PRICE	SALES TAX PLUS FINAL BUY	UNIT PRICE WITH TAX	TOTAL PRICE	PLUGGED - P QUOTED - Q	NO. OF QUOTES RECEIVED	PRICE DIFF. BETWEEN LOW & SECOND
		PERMANENT MATERIAL PRICES							
399 RAIL TRANSPORT		CAR	$2,034.00	1.00	$2,034.00	$0.00			
400 RAILCAR SITE MOVEMENT		CAR	$186.55	1.00	$186.55	$0.00			
401 SOIL DISPOSAL		TON	$15.00	1.06	$15.94	$0.00			
402				1.06	$0.00	$0.00			
403				1.06	$0.00	$0.00			
404				1.06	$0.00	$0.00			
405				1.06	$0.00	$0.00			
406				1.06	$0.00	$0.00			
407				1.06	$0.00	$0.00			
408				1.06	$0.00	$0.00			
		MAJOR SUPPLY PRICES:							
411 CRUSHED AGGREGATE		TNS	$15.00	1.06	$15.94	$0.00	P		
412 CONCRETE		CY	$97.00	1.06	$103.06	$0.00	Q		
413 REBAR		TNS	$900.00	1.06	$956.25	$0.00	P		
414 FORM MATERIALS		EA	$500.00	1.06	$531.25	$0.00	P		
415 SILT FENCE		LF	$0.21	1.06	$0.22	$0.00	Q		
416 CONSTRUCTION FENCE		LF	$0.36	1.06	$0.38	$0.00	Q		
417 DEBRIS DISPOSAL - NON HAZ		TNS	$20.00	1.06	$21.25	$0.00	P		
418 GRIP-TACK SPRAY ON LINER		GAL	$25.00	1.06	$26.56	$0.00	P		
419 TEMPORARY FENCE		LF	$7.00	1.06	$7.44	$0.00	P		
420 SOIL DISPOSAL (INORG)		TNS	$15.00	1.06	$15.94	$0.00	P		
421 SKIMMER PUMP		EA	$2,500.00	1.06	$2,656.25	$0.00	P		
422 NAPL TRANSPORT DISPOSAL		GAL	$3.00	1.06	$3.19	$0.00	P		
423 NON HAZ SLUDGE HAUL/RECYCLE		TNS	$44.00	1.06	$46.75	$0.00	Q		
424 SAND BAGS		EA	$0.98	1.06	$1.04	$0.00	Q		
425 DOUBLE SWING GATE		EA	$1,000.00	1.06	$1,062.50	$0.00	P		
426 15 MIL POLY LINER		SF	$0.05	1.06	$0.05	$0.00	Q		
427 3/8" PEA GRAVEL		TNS	$13.33	1.06	$14.16	$0.00	Q		
428 1/2" - 2" COARSE WASHED AGGREGATE		TNS	$11.33	1.06	$12.04	$0.00	Q		
429 WOVEN GEOTEXTILE		SF	$0.25	1.06	$0.27	$0.00	Q		
430 SAND BACKFILL (LINER PROTECTION)		TNS	$11.33	1.06	$12.04	$0.00	Q		
431 CLEAN STRUCTURAL FILL		TNS	$8.67	1.06	$9.21	$0.00	Q		
432 EARTHEN MATERIAL		TNS	$8.00	1.06	$8.50	$0.00	Q		
433 STEEL GRATING		EA	$500.00	1.06	$531.25	$0.00	P		
434 LTU IRRIGATION SYSTEM		EA	$37,700.00	1.06	$40,056.25	$0.00	Q		
435 55-GAL HDPE DRUM		EA	$100.00	1.06	$106.25	$0.00	P		
436 STOP SIGN		EA	$79.20	1.06	$84.15	$0.00	Q		
437 WARNING SIGN		EA	$6.75	1.06	$7.17	$0.00	Q		
438 STAFF GAUGE		EA	$35.00	1.06	$37.19	$0.00	Q		
439 FLASH TAPE		ROLL	$28.00	1.06	$29.75	$0.00	Q		
440 PIPE LOCATOR TAPE		ROLL	$170.70	1.06	$181.37	$0.00	Q		
441 DEBRIS SCREEN		EA	$500.00	1.06	$531.25	$0.00	P		

442 FIRE EXTINGUISHER	EA	$39.97	1.06	$42.47	$0.00	Q
443 5HP PUMP	EA	$1,500.00	1.06	$1,593.75	$0.00	P
444 NON-WOVEN GEOTEXTILE	SF	$0.03	1.06	$0.03	$0.00	P
445 DEBRIS DISPOSAL - HAZ	TNS	$50.00	1.06	$53.13	$0.00	P
446 SLUDGE DISPOSAL - HAZ	TNS	$192.00	1.06	$204.00	$0.00	Q
447 NAPL SOIL TRANSPORT DISPOSAL	TNS	$44.00	1.06	$46.75	$0.00	Q
448 PCP LTU MECH MATLS	LS	$61,650.00	1.06	$65,503.13	$0.00	Q
449 HYD LTU MECH MATLS	LS	$27,420.00	1.06	$29,133.75	$0.00	Q
450			1.06	$0.00	$0.00	
	SUBCONTRACT PRICES:					
453 EXECUTION PLAN	EA	$5,000.00	1.00	$5,000.00	$0.00	P
454 HASP	EA	$2,500.00	1.00	$2,500.00	$0.00	P
455 PERMITS	EA	$5,000.00	1.00	$5,000.00	$0.00	P
456 EQUIPMENT MOB/DEMOB	EA	$1,000.00	1.00	$1,000.00	$0.00	P
457 ASPHALT ROADWAY	SF	$20.00	1.00	$20.00	$0.00	P
458 WELL ABANDONMENT	LF	$9.50	1.00	$9.50	$0.00	Q
459 NORTHWEST ENERGY	LS	$986,200.00	1.00	$986,200.00	$0.00	Q
460 WESTERN GAS LINE INSTALL	LS	$12,000.00	1.00	$12,000.00	$0.00	P
461 WESTERN ELECTRICAL LINE	LS	$8,000.00	1.00	$8,000.00	$0.00	P
462 RAIL LINE REMOVAL/INSTALL	LS	$185,000.00	1.00	$185,000.00	$0.00	Q
463 GEOCOMPOSITE CLAY LINER	SF	$0.60	1.00	$0.60	$0.00	Q
464 60 MIL HDPE LINER	SF	$0.60	1.00	$0.60	$0.00	Q
465 GEOCOMPOSITE DRAINAGE LAYER	SF	$0.60	1.00	$0.60	$0.00	Q
466 40 MIL HDPE LINER	SF	$0.50	1.00	$0.50	$0.00	Q
467 40 MIL LDPE LINER	SF	$0.48	1.00	$0.48	$0.00	Q

PROJECT:	**KRY HC OFF-SITE DISPOSAL**	DATE:	12-Mar-13	**SHT 6 OF SHT 11**
JOB NO.:	**60147138**			
CLIENT:	**BNSF**	TIME:	03:56 PM	
LOCATION:	**KALISPELL, MT**			
		ESTIMATOR:	**TMK**	

FIXED COST JOBSITE OVERHEADS **(UP FRONT, ONE TIME COSTS TO THE PROJECT)**

	DESCRIPTION	REQUIRED Y OR N	REQUIRED QUANTITY	UNIT RATE	I LABOR	J INT EQUIP	K EXT EQUIP	L FUEL	M REPAIRS	N SUPPLIES	O SUBS	P TRAVEL	Q TOTALS
	*******SITE UTILITY HOOKUPS*******												
239	ELECTRIC			$2,500							0		0
240	WATER (NO METER VLT OR BKFLW PRVNTR)			$500							0		0
241	SEWER			$2,500							0		0
242	GAS			$2,500							0		0
243	TELEPHONE			$350							0		0
244											0		0
245											0		0
	*******INITIAL HEALTH AND SAFETY COSTS*******												
247	PHYSICALS			$1,300						0			0
248	TRAINING CLASS COSTS-EXTERNAL			$700							0		0
249	TRAINING CLASS COSTS-INTERNAL			$450						0			0
250	INITIAL H & S PURCHASES			$1,500						0			0
251										0			0
252										0			0
	*******INSURANCE AND TAXES*******												
254	CLIENT NAMED AS ADDITIONAL INSURED			$0						0			0
255	BUILDERS RISK INSURANCE (0.60 % OF REV.)									0			0
256	POLLUTION LIABILITY INSURANCE									0			0
257	SPECIAL TAXES									0			0
258										0			0
259										0			0
	*******SITE OFFICE EQUIPMENT*******												
261	OFFICE FURNITURE (PER UNIT)			$100						0			0
262	FAX MACHINE			$400						0			0
263	COMPUTER			$2,000						0			0
264	COMPUTER SOFTWARE			$500						0			0
265										0			0
266										0			0
	*******MISCELLANEOUS COSTS*******												
268	PERMITS			$100						0			0
269	ROYALITIES ON PROCESSES									0			0
270	TEMPORARY FENCING			$2						0			0
271	MOVING EXPENSES (LONG TERM PROJECT)									0			0
272	PROJECT SIGN			$150						0			0
273										0			0
274										0			0
	TOTAL FIXED OVERHEADS				0	0	0	0	0	0	0	0	0

PROJECT: **KRY HC OFF-SITE DISPOSAL** DATE: 12-Mar-13 **SHT 7 OF SHT 11**
JOB NO.: **60147138**
CLIENT: **BNSF** TIME: 03:56 PM
LOCATION: **KALISPELL, MT**
ESTIMATOR: **TMK** PROJECT DURATION = 1.0 WEEKS

VARIABLE COST JOBSITE OVERHEADS

(WEEKLY COSTS ASSOCIATED WITH MANAGEMENT OF THE PROJECT)

DESCRIPTION	REQUIRED Y OR N	REQUIRED QUANTITY	DURATION	UNIT RATE	I TOTAL LABOR	J WEEKLY LABOR	K WEEKLY INT EQUIP	L WEEKLY EXT EQUIP	M WEEKLY FUEL	N WEEKLY REPAIRS	O WEEKLY SUPPLIES	P WEEKLY SUBS	Q WEEKLY TRAVEL	Q WEEKLY TOTALS
*******FULL TIME EXEMPT*******														
294 PROJECT MANAGER			1.0	$2,904	0	0	0		0	0			0	0
295 SUPERINTENDENT			1.0	$2,687	0	0	0		0	0			0	0
296 PROJ. ENGINEER			1.0	$2,033	0	0	0		0	0			0	0
297 H&S OFFICER			1.0	$1,676	0	0	0		0	0			0	0
298			1.0											0
*******FULL TIME NON-EXEMPT*******														
301 AST. PROJ. ENG.			1.0	$2,392	0	0							0	0
302 FIELD ENGINEER			1.0	$2,392	0	0	0		0	0			0	0
303 ENGINEER TECH.			1.0	$1,841	0	0							0	0
304 H&S TECHNICIAN			1.0											0
305			1.0											0
*******LOCAL HOURLY*******														
308 FIELD FORMAN (L)			1.0	$3,142	0	0							0	0
309 MECHANIC(L)			1.0	$3,844	0	0		0					0	0
310 OILER (L)			1.0	$3,428	0	0							0	0
311 CLERK (L)			1.0	$884	0	0							0	0
312			1.0											0
*******CORE HOURLY*******														
315 FIELD FOREMAN(C)			1.0	$0	0	0							0	0
316 MECHANIC(C)			1.0	$0	0	0		0					0	0
317 GRADE CHECKER (C)			1.0	$0	0	0							0	0
318														0
*******SERVICES DIVISION UNION HOURLY*******														
321 FOREMAN (SU)			1.0	$0	0	0							0	0
322														0
*******INTERNAL EQUIPMENT RENTAL*******														
325 PRESSURE WASHER (INTERNAL RATE)			1.0	$30			0							0
326 SAFETY EQUIPMENT (AIR SAMPLING/OVA)			1.0	$500			0							0
327			1.0				0							0
328			1.0				0							0
*******EXTERNAL EQUIPMENT RENTAL*******														
331 OFFICE TRAILER			1.0	$200				0						0
332 TOOL TRAILER			1.0	$75				0						0
333 CHANGE TRAILER			1.0	$100				0						0
334 DECONTAMINATION TRAILER			1.0	$250				0						0
335 LAB TRAILER			1.0	$100				0						0
336 FUEL TRUCK			1.0	$200				0						0
337 GREASE TRUCK			1.0	$200				0						0
338 MISC. EQUIP			1.0	$75				0						0
339 SITE SCALES			1.0	$2,000				0						0
340 PROJECT VEHICLES			1.0	$150				0	0	0				0
341 STREET SWEEPER			1.0	$400				0						0
342 JOBSITE PHOTOS			1.0	$25				0						0
343 WATER TRUCK			1.0	$250				0						0
344			1.0					0						0
345			1.0					0						0
*******SUPPLIES*******														
348 OFFICE SUPPLIES			1.0	$50							0			0

349	SURVEY SUPPLIES			1.0	$50						0			0
350	SAFETY SUPPLIES			1.0	$200						0			0
351	COPY MACHINE			1.0	$40						0			0
352	PHONE SERVICE			1.0	$150						0			0
353	UTILITY SERVICES			1.0	$40						0			0
354	POTABLE WATER			1.0	$40						0			0
355	SANITARY FACILITIES			1.0	$30						0			0
356	SMALL TOOLS			1.0	$150						0			0
357	JOBSITE PHOTOS			1.0	$15						0			0
358	ON-SITE QC TESTING EQUIP.			1.0	$200						0			0
359	ON SITE LAB SUPPLIES			1.0	$500						0			0
360	DECONTAMINATION SUPPLIES			1.0	$75						0			0
361	WATER (DUST CONTROL)			1.0	$70						0			0
362				1.0							0			0
*******SUBCONTRACTS*******														
365	SURVEY CREW (BASED ON $90/HR FOR 40 HRS)			1.0	$3,600							0		0
366	SECURITY (FULL TIME AT $12/HOUR)			1.0	$2,016							0		0
367				1.0								0		0
368				1.0								0		0
*******TRAVEL COSTS*******														
371	TRAVEL, EXECUTIVE			1.0	$250								0	0
372				1.0									0	0
373				1.0									0	0
	VARIABLE JOBSITE OVERHEADS	(WEEKLY)				0	0	0	0	0	0	0	0	0
	VARIABLE JOBSITE OVERHEADS	(TOTAL)	1 WEEKS			0	0	0	0	0	0	0	0	0

PROJECT:	**KRY HC OFF-SITE DISPOSAL**	ESTIMATOR:	**TMK**	SHT 8 OF	**SHT 11**
JOB NO.:	**60147138**				
CLIENT:	**BNSF**	DATE:	12-Mar-13	TIME:	03:56 PM
LOCATION:	**KALISPELL, MT**				
ITEM DESCRIPTION:	LOAD SOIL TO RAILCARS			BIDFORM QUANTITY:	8,300 BCY
				TAKE-OFF QUANTITY:	8,300 BCY

ESTIMATOR NOTES AND ASSUMPTIONS:

Load, weigh, and document hydrocarbon impacted soil for off-site disposal. Spray cover on railcars.

8300 BCY
9,960 LCY of soil
1.5 tons/LCY
15000 tons of soil for loading
1000 tons per day for loading
15.0 days

Assume 5 gallons per railcar for spray on cover (dust suppressant). 188 railcars = 940 gallons.
Work performed by laborers in manlift for duration of loading.

DURATION = 150 HOURS

DESCRIPTION	QUANTITY	UNIT	LABOR	INT EQUIP	EXT EQUIP	FUEL	REPAIRS	SUPPLIES	MATERIALS	SUBS	TRAVEL	TOTAL	UNIT COST
CAT 950 WHEEL LOADER	1.00	EA	49.45		30.57	19.25	5.00				0.00		
TANDEM DUMP TRUCK 25 TN	4.00	EA	197.81		100.80	63.00	12.00				0.00		
CAT D5LGP DOZER	1.00	EA	49.45		48.09	15.75	6.00				0.00		
COMMON LABORER (L)	3.00	EA	148.13								0.00		
CREW			444.85	0.00	179.46	98.00	23.00	0.00	0.00	0.00	0.00	HOURLY CREW COSTS	745.31
SUBTOTAL	150	HOURS	66,727	0	26,919	14,700	3,450	0	0	0	0	111,796	13.47
MATERIALS:													
GRIP-TACK SPRAY ON LINER	940	GAL						24,966				24,966	
												0	
												0	
												0	
												0	
												0	
												0	
												0	
												0	
												0	
												0	
												0	
TOTALS			66,727	0	26,919	14,700	3,450	24,966	0	0	0	136,762	16.48
											Horizontal Check:	136,762	

PROJECT:	**KRY HC OFF-SITE DISPOSAL**	ESTIMATOR:	**TMK**	SHT 9 OF	**SHT 11**
JOB NO.:	**60147138**				
CLIENT:	**BNSF**	DATE:	12-Mar-13	TIME:	03:56 PM
LOCATION:	**KALISPELL, MT**				
ITEM DESCRIPTION:	RAIL TRANSPORT			BIDFORM QUANTITY:	167 CARS
				TAKE-OFF QUANTITY:	167 CARS

ESTIMATOR NOTES AND ASSUMPTIONS:
Rail transport of hydrocarbon impacted soil to Gascoyne facility in North Dakota.
Includes costs from Mission Mountain Railroad to manage railcars at the site.
15,000 tns on soil, 80 tns per car = 167 railcars
Rail transport paid direct by Owner.

DURATION = 0 HOURS

DESCRIPTION	QUANTITY	UNIT	LABOR	INT EQUIP	EXT EQUIP	FUEL	REPAIRS	SUPPLIES	MATERIALS	SUBS	TRAVEL	TOTAL	UNIT COST
											0.00		
											0.00		
											0.00		
CREW			0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	HOURLY CREW COSTS	0.00
SUBTOTAL	0	HOURS	0	0	0	0	0	0	0	0	0	0	0.00
MATERIALS:													
RAIL TRANSPORT	167	CAR							339,678			339,678	
RAILCAR SITE MOVEMENT	167	CAR							31,154			31,154	
												0	
												0	
												0	
												0	
												0	
												0	
												0	
												0	
												0	
												0	
TOTALS			0	0	0	0	0	0	370,832	0	0	370,832	2,220.55
											Horizontal Check:	370,832	

PROJECT:	**KRY HC OFF-SITE DISPOSAL**	ESTIMATOR:	**TMK**	SHT 10 OF	**SHT 11**
JOB NO.:	**60147138**				
CLIENT:	**BNSF**	DATE:	12-Mar-13	TIME:	03:56 PM
LOCATION:	**KALISPELL, MT**				
ITEM DESCRIPTION:	SOIL DISPOSAL			BIDFORM QUANTITY:	8,300 BCY
				TAKE-OFF QUANTITY:	8,300 BCY

ESTIMATOR NOTES AND ASSUMPTIONS:
Disposal of 15,000 tns of hydrocarbon impacted soil at Gascoyne facility in North Dakota.
Disposal paid direct by Owner.

DURATION = 0 HOURS

DESCRIPTION	QUANTITY	UNIT	LABOR	INT EQUIP	EXT EQUIP	FUEL	REPAIRS	SUPPLIES	MATERIALS	SUBS	TRAVEL	TOTAL	UNIT COST
											0.00		
											0.00		
											0.00		
											0.00		
											0.00		
											0.00		
											0.00		
CREW			0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	HOURLY CREW COSTS	0.00
SUBTOTAL	0	HOURS	0	0	0	0	0	0	0	0	0	0	0.00
MATERIALS:													
SOIL DISPOSAL	15,000	TON							239,100			239,100	
												0	
												0	
												0	
												0	
												0	
												0	
												0	
												0	
												0	
												0	
												0	
TOTALS			0	0	0	0	0	0	239,100	0	0	239,100	28.81
										Horizontal Check:		239,100	

PROJECT:	**KRY HC OFF-SITE DISPOSAL**	ESTIMATOR:	**TMK**	SHT 11 OF	**SHT 11**
JOB NO.:	**60147138**				
CLIENT:	**BNSF**	DATE:	12-Mar-13	TIME:	03:56 PM
LOCATION:	**KALISPELL, MT**				
ITEM DESCRIPTION:	IMPORT AND PLACE CLEAN BACKFILL			BIDFORM QUANTITY:	15,000 TNS
				TAKE-OFF QUANTITY:	15,000 TNS

ESTIMATOR NOTES AND ASSUMPTIONS:
Assume placement of 15,000 tns (9960 LCY, 8300 BCY) at 2000 tns imported fill per day = 8 days
Place and compact soil with dozer and 2 compactors.

DURATION = 80 HOURS

DESCRIPTION	QUANTITY	UNIT	LABOR	INT EQUIP	EXT EQUIP	FUEL	REPAIRS	SUPPLIES	MATERIALS	SUBS	TRAVEL	TOTAL	UNIT COST
CAT D6 DOZER	1.00	EA	49.45		57.56	21.00	8.00				0.00		
CAT 824G COMPACTOR	2.00	EA	98.91		151.50	105.00	14.00				0.00		
COMMON LABORER (L)	2.00	EA	98.76								0.00		
											0.00		
											0.00		
											0.00		
CREW			247.11	0.00	209.06	126.00	22.00	0.00	0.00	0.00	0.00	HOURLY CREW COSTS	604.17
SUBTOTAL	80	HOURS	19,769	0	16,725	10,080	1,760	0	0	0	0	48,334	3.22
MATERIALS:													
CLEAN STRUCTURAL FILL	15,000	TNS						138,150				138,150	
												0	
												0	
												0	
												0	
												0	
												0	
												0	
												0	
												0	
												0	
												0	
TOTALS			19,769	0	16,725	10,080	1,760	138,150	0	0	0	186,484	12.43
											Horizontal Check:	186,484	

PROJECT:	**KRY HYDROCARBON LTU**	ESTIMATOR: **TMK**				SHT 1 OF	**SHT 13**
JOB NO.:	**60147138**						
CLIENT:	**BNSF**					TEMPLATE RELEASE	3.00
LOCATION:	**KALISPELL, MT**	DATE:	02-Apr-12	TIME:	04:42 PM	DATED	0-Jan-00

ESTIMATE SUMMARY - CAPITAL COSTS

ITEM DESCRIPTION	DETAIL SHEET	BIDFORM QUANTITY	UNIT	LABOR	INT. EQUIP	EXT. EQUIP	FUEL	REPAIRS	SUPPLIES	MATERIAL	SUBS	TRAVEL	UNIT COSTS	TOTAL COSTS	UNIT PRICE	TOTAL PRICE
TOTAL FIXED OVERHEADS	SHT 6	1	LS	0	0	0	0	0	0		0	0	0.00	0	0.00	0
VARIABLE JOBSITE OVERHEADS	SHT 7	1	WEEKS	0	0	0	0	0	0		0	0	0.00	0	0.00	0
HYDROCARBON LTU CONSTRUCT	SHT 8	1	LS	36,109	0	10,420	4,200	1,275	104,290	0	106,200	0	262,494.35	262,494	310,540.62	310,541
SOIL SCREENING	SHT 9	8,300	BCY	15,559	0	4,461	3,150	750	0	0	0	0	2.88	23,920	3.45	28,635
LOAD SOIL TO LTU	SHT 10	8,300	BCY	14,829	0	6,827	3,413	870	0	0	0	0	3.13	25,939	3.74	31,042
HYDROCARBON LTU TILLING	SHT 11	1	LS	213,528	0	34,560	25,200	4,320	63,750	332,467	0	0	673,824.88	673,825	742,959.27	742,959
LOADOUT HYDROCARBON LTU	SHT 12	12,500	TNS	39,080	0	26,586	12,775	3,400	0	0	25,000	1,473	8.67	108,314	10.27	128,375
LTU CLOSURE	SHT 13	1	LS	14,687	0	8,108	3,696	960	531	0	4,000	442	32,424.25	32,424	38,654.56	38,655
SUBTOTAL				333,792	0	90,962	52,434	11,575	168,572	332,467	135,200	1,915		1,126,916		
WEATHER FACTOR USED IN CALCS =		5.00%		16,690	0	4,548			8,429			96		29,763		
TOTAL ESTIMATE				350,482	0	95,510	52,434	11,575	177,001	332,467	135,200	2,011		1,156,679		

1,156,679 <=== ESTIMATE CHECK

0	<= SPEC. TAX	@	0.00%
0	<= BONDS	@	0.00%
0	<= SPEC. INS	@	0.00%

MARK-UP SUMMARY	COST	MARK-UP %'AGE	MARK-UP	TOTAL
LABOR	350,482	15.00%	52,572	403,054
INTERNAL EQUIPMENT	0	15.00%	0	0
EXTERNAL EQUIPMENT	95,510	15.00%	14,327	109,837
FUEL	52,434	15.00%	7,865	60,299
REPAIRS	11,575	15.00%	1,736	13,311
SUPPLIES	177,001	15.00%	26,550	203,551
TRAVEL	2,011	15.00%	302	2,313
MATERIALS	332,467	0.00%	0	332,467
SUBS	135,200	15.00%	20,280	155,480
BONDS	0	0.00%	0	0
TOTALS	1,156,679		123,632	1,280,311

SUBTOTAL ESTIMATED PRICE		1,280,206
CONTINGENCY	0%	0
TOTAL ESTIMATE		1,280,206

AECOM. 2012a. Technical Memo: Rationale for Treatment of Petroleum Hydrocarbon Impacted Soil at an Off-Site Land Treatment Unit. April.

PROJECT:	**KRY HYDROCARBON LTU**	DATE:	02-Apr-12	**SHT 2 OF SHT 13**
JOB NO.:	**60147138**			
CLIENT:	**BNSF**	TIME:	04:42 PM	
LOCATION:	**KALISPELL, MT**			
		ESTIMATOR:	**TMK**	

ESTIMATOR NOTES:

Estimate for treatment of the hydrocarbon impacted soil exceeding regulatory limits in an on-site LTU.
This is an incremental estimate for comparison to off-site disposal of hydrocarbon impacted soil therefore common tasks such as excavation, jobsite supervision, etc. is not included.
Assumes no difference in duration for the overall project as a result of constructing the hydrocarbon LTU.
LTU Laboratory Analytical costs and Fertilizer costs have been included as a Material with no markup by a contractor assuming direct pay by the Owner
No contingency has been added to this estimate since it is for comparative purposes only

PROJECT:	**KRY HYDROCARBON LTU**	DATE:	02-Apr-12	**SHT 3a OF**	**SHT 13**
JOB NO.:	**60147138**				
CLIENT:	**BNSF**	TIME:	04:42 PM		
LOCATION:	**KALISPELL, MT**				

WEEKLY WORK HOUR BASIS: ESTIMATOR: TMK

1) PROJECT BASED ON WORKING 60 HOURS PER WEEK.
2) RATES ARE BASED ON LABOR RATES FROM MEANS

SUBSISTENCE AND TRAVEL COST CALCULATIONS: **AMOUNTS APPLIED TO THE FIRST 40 HOURS OF WORK**

S&T CLASS	GENERAL DESCRIPITON	TRAVEL BASIS (WKS/TRP)	TRAVEL COST (PER TRIP)	LODGING COST (PER NIGHT)	SUBSISTENCE COST (PER WEEK)	HOURLY COSTS TRAVEL	LODGING	SUBSISTENCE	TOTALS
FULL TIME PERSONNEL:									
S1	TRAVEL BY AIR	3	$500	$80.00	$210	$4.17	$12.67	$5.25	$22.09
S2	TRAVEL BY AUTO (DISTANT)	3	$200	$80.00	$210	$1.67	$12.67	$5.25	$19.59
S3	TRAVEL BY AUTO (LOCAL)	3				$0.00	$0.00	$0.00	$0.00
S4						#DIV/0!	#DIV/0!	$0.00	#DIV/0!
S5						#DIV/0!	#DIV/0!	$0.00	#DIV/0!
SITE HIRE PERSONNEL:									
H1	TRAVEL BY AIR	1	$0	$0.00	$0	$0.00	$0.00	$0.00	$0.00
H2	TRAVEL BY AUTO (DISTANT)	1	$0	$0.00	$0	$0.00	$0.00	$0.00	$0.00
H3	TRAVEL BY AUTO (LOCAL)	1				$0.00	$0.00	$0.00	$0.00
H4						#DIV/0!	#DIV/0!	$0.00	#DIV/0!
H5						#DIV/0!	#DIV/0!	$0.00	#DIV/0!

TAX AND INSURANCE CALCULATIONS:

	DESCRIPTION	LOCAL HOURLY	CORE HOURLY	UNION HOURLY	SERVICES SALARIED	CONSTRUCTION SALARIED	REMARKS
*	Federal Unemployment Tax %	0.16%	0.16%	0.16%	0.13%	0.07%	= Average Federal Unemployment Tax Rate applied to all wages paid.
*	State Unemployment Tax %	1.12%	1.09%	1.37%	0.95%	0.66%	= Average State Unemployment Tax Rate applied to all wages paid.
*	FICA %	8.70%	8.70%	8.70%	7.40%	6.50%	= Average Social Security Tax applied to all wages paid.
	Workmans Compensation %	26.60%	26.60%	26.60%	26.60%	26.60%	= Average Workmen's Compensation Rate for all states.
	PTO / Holidays %	0.00%	4.76%	8.67%	9.70%	11.37%	= Average rate applied to base wage to cover vacation/holiday costs.
	Medical Insurance %	0.00%	5.41%	0.00%	6.62%	4.94%	= Average rate applied to base wage to cover hospitalization, disability, and life insurance costs.
	401 (k) %	0.00%	0.28%	0.00%	0.57%	0.66%	= Corporate Match for 401(k)
	Union H & W (ervices Union only	0.00%	0.00%	20.57%	0.00%	0.00%	= Health and Welfare for Internal Union. TO BE USED ON SERVICES PROJECTS ONLY.
	STRAIGHT %	36.58%	47.00%	66.07%	51.97%	50.80%	= Total burden applied to all straight time wages paid.
*	OVERTIME %	9.98%	9.95%	10.23%	8.48%	7.23%	= Total burden applied to all overtime wages paid.
	PAYROLL BURDEN DESIGNATION TO INSERT ON SHEET 3b, COLUMN J.	**LH**	**CH**	**UH**	**SS**	**CS**	

PROJECT: **KRY HYDROCARBON LTU** DATE: 02-Apr-12 **SHT 3b OF** **SHT 13**
JOB NO.: **60147138**
CLIENT: **BNSF** TIME: 04:42 PM
LOCATION: **KALISPELL, MT**
ESTIMATOR: TMK

Caution: If any of the Descriptions listed in Column B are changed on this sheet, those identical changes MUST be made on Sheet 7 as applicable. If this is not done, when attempting to "Calculate" the estimate, a "Circular Reference" message will be received.

Labor Location: Missoula, MT Location Factor: 0.963

WAGE RATE TABLE

	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R
	ESCAL			<==FRINGES==>		<===BURDEN CALCULATION===>			<==OTHER ADD ONS==>		STRAIGHT HOURLY		PREMIUM HOURLY		AVG HOURLY	@ 60 HRS
	FACTOR	SUB & TRVL	BASE	TAXABLE	NON-TAXABLE	BURDEN	ST BURDEN	OT BURDEN		SUB &	BARE	TOTAL	BARE	TOTAL	BARE	TOTAL
DESCRIPTION	MULTIPLIER	CLASS	WAGE	VACATION	OTHER	DESIGNATION	%	%		TRAVEL	HOURLY	HOURLY	HOURLY	HOURLY	HOURLY	HOURLY
******* LOCAL HOURLY*******																
70 FIELD FORMAN (L)	1.00	H1	$33.80			LH	36.58%	9.98%		$0.00	$33.80	$46.17	$50.70	$64.75	$39.43	$52.36
71 LIGHT OPERATOR (L)	1.00	H1	$39.77			LH	36.58%	9.98%		$0.00	$39.77	$54.32	$59.66	$76.19	$46.40	$61.61
72 MEDIUM OPERATOR (L)	1.00	H1	$41.36			LH	36.58%	9.98%		$0.00	$41.36	$56.49	$62.04	$79.23	$48.25	$64.07
73 HEAVY OPERATOR (L)	1.00	H1	$42.76			LH	36.58%	9.98%		$0.00	$42.76	$58.40	$64.14	$81.91	$49.88	$66.24
74 TRUCK DRIVER (L)	1.00	H1	$31.92			LH	36.58%	9.98%		$0.00	$31.92	$43.60	$47.89	$61.16	$37.24	$49.45
75 COMMON LABORER (L)	1.00	H1	$31.88			LH	36.58%	9.98%		$0.00	$31.88	$43.54	$47.81	$61.06	$37.19	$49.38
76 SKILLED WORKER (L)	1.00	H1	$41.02			LH	36.58%	9.98%		$0.00	$41.02	$56.03	$61.54	$78.59	$47.86	$63.55
77 MECHANIC( )	1.00	H1	$41.36			LH	36.58%	9.98%		$ .00	$41.36	$ 6.49	$62.04	$ 9.23	$48.25	$ 4.07
78 OILER (L)	1.00	H1	$36.88			LH	36.58%	9.98%		$0.00	$36.88	$50.37	$55.32	$70.66	$43.03	$57.14
79 CLERK (L)	1.00	H1	$9.51			LH	36.58%	9.98%		$0.00	$9.51	$12.99	$14.27	$18.23	$11.10	$14.74
80 ELECTRICIAN (L)	1.00	H1	$47.19			LH	36.58%	9.98%		$0.00	$47.19	$64.45	$70.78	$90.40	$55.05	$73.10
81 PIPE FITTER (L)	1.00	H1	$49.98			LH	36.58%	9.98%		$0.00	$49.98	$68.26	$74.97	$95.75	$58.31	$77.42
82 STRUCT STEEL WORKER (L)	1.00	H1	$45.16			LH	36.58%	9.98%		$0.00	$45.16	$61.69	$67.75	$86.52	$52.69	$69.96
83	1.00					LH	36.58%	9.98%		$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00
*******CORE HOURLY*******																
85 FIELD FOREMAN(C)	1.00					CH	47.00%	9.95%		$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00
86 MECHANIC(C)	1.00					CH	47.00%	9.95%		$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00
87 KEY OPERATOR	1.00					CH	47.00%	9.95%		$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00
88 KEY LABORER	1.00					CH	47.00%	9.95%		$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00
89 GRADE CHECKER (C)	1.00					CH	47.00%	9.95%		$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00
90	1.00					CH	47.00%	9.95%		$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00
*******SERVICES DIVISION UNION HOURLY*******																
92 FOREMAN (SU)	1.00					UH	66.07%	10.23%		$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00
93 EQUIPMENT OPERATOR (SU)	1.00					UH	66.07%	10.23%		$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00
94 LABORER (SU)	1.00					UH	66.07%	10.23%		$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00
95	1.00					UH	66.07%	10.23%		$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00
*******FULL TIME EXEMPT*******																
97 PROJECT MANAGER	1.00	S1	$48.15			CS	50.80%	7.23%		$22.09	$48.15	$94.70	$0.00	$0.00	$32.10	$63.13
98 SUPERINTENDENT	1.00	S1	$44.54			CS	50.80%	7.23%		$22.09	$44.54	$89.25	$0.00	$0.00	$29.69	$59.50
99 PROJ. ENGINEER	1.00	S1	$33.71			CS	50.80%	7.23%		$22.09	$33.71	$72.92	$0.00	$0.00	$22.47	$48.61
100 H&S OFFICER	1.00	S1	$27.78			CS	50.80%	7.23%		$22.09	$27.78	$63.99	$0.00	$0.00	$18.52	$42.66
101	1.00					CS	50.80%	7.23%		$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00
*******FULL TIME NON-EXEMPT*******																
103 AST. PROJ. ENG.	1.00	S1	$29.26			CS	50.80%	7.23%		$22.09	$29.26	$66.21	$29.26	$31.37	$29.26	$54.60
104 FIELD ENGINEER	1.00	S1	$29.26			CS	50.80%	7.23%		$22.09	$29.26	$66.21	$29.26	$31.37	$29.26	$54.60
105 ENGINEER TECH.	1.00	S1	$22.51			CS	50.80%	7.23%		$22.09	$22.51	$56.04	$22.51	$24.14	$22.51	$45.41
106 H&S TECHNICIAN	1.00	S1	$18.52			CS	50.80%	7.23%		$22.09	$18.52	$50.02	$18.52	$19.86	$18.52	$39.96
107	1.00					CS	50.80%	7.23%		$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00
*******CORE FULL TIME HOURLY*******																
109 OFFICE MANAGER (C)	1.00					CH	47.00%	9.95%		$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00
110 CLERK (C)	1.00					CH	47.00%	9.95%		$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00
111	1.00					CH	47.00%	9.95%		$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00

PROJECT: **KRY HYDROCARBON LTU**
JOB NO.: **60147138**
CLIENT: **BNSF**
LOCATION: **KALISPELL, MT**

DATE: 02-Apr-12
TIME: 04:42 PM
ESTIMATOR: TMK

USE TAX RATE =======> 6.25%
FINAL BUY ON EQUIPMENT ========> 0.00% **(NEGATIVE NUMBER)**

SHT 4 OF **SHT 13**

LOCATION FACTOR: 0.988

HOURLY FUEL RATE IS BASED UPON PAYING $3.50 PER GALLON.

EQUIPMENT RENTAL RATES

RENTAL RATE BASIS 176 HOURS PER MONTH
ESTIMATED EQUIPMENT USEAGE 176 HOURS PER MONTH
OVER-USE HOURS FACTOR 0.6 TIMES BASE RATE

EQUIPMENT ADJUSTMENT FACTORS:

DAILY	D	1.81
MONTHLY	M	1.00
WEEKLY	W	1.44

DESCRIPTION	TYPE		F MONTHLY RENTAL	G USE TAX PLUS FINAL BUY	H HOURLY RENTAL 176 HR/MO	I HOURLY FUEL RATE	J HOURLY REPAIRS RATE	K PERIOD USAGE D,W,M	L ADJUSTMENT FACTOR APPLIED
******** INTERNAL EQUIPMENT ********									
129				1.00	$0.00	$0.00	$0.00		0.00
130				1.00	$0.00	$0.00	$0.00		0.00
131				1.00	$0.00	$0.00	$0.00		0.00
******** EXTERNAL EQUIPMENT ********									
133 CAT D8 DOZER	DOZER	300 HP	$13,832	1.06	$83.50	$38.50	$10.00	M	1.00
134 CAT D6 DOZER	DOZER	185 HP	$9,534	1.06	$57.56	$21.00	$8.00	M	1.00
135 CAT D6LGP DOZER	LGP DOZER	185 HP	$11,918	1.06	$71.95	$21.00	$8.00	M	1.00
136 CAT D5 DOZER	DOZER	115 HP	$6,373	1.06	$38.47	$15.75	$6.00	M	1.00
137 CAT D5LGP DOZER	LGP DOZER	115 HP	$7,966	1.06	$48.09	$15.75	$6.00	M	1.00
138 CAT D4 DOZER	DOZER	80 HP	$3,335	1.06	$20.13	$12.25	$5.00	M	1.00
139 CAT 385 EXCAVATOR	EXCAVATOR	180,000 LB	$22,823	1.06	$137.78	$63.00	$17.00	M	1.00
140 CAT 345 EXCAVATOR	EXCAVATOR	100,000 LB	$14,030	1.06	$84.70	$38.85	$9.00	M	1.00
141 CAT 330 EXCAVATOR	EXCAVATOR	76,000 LB	$10,473	1.06	$63.22	$30.45	$6.00	M	1.00
142 CAT 325 EXCAVATOR	EXCAVATOR	60,000 LB	$8,324	1.06	$50.25	$24.85	$5.00	M	1.00
143 CAT 320 EXCAVATOR	EXCAVATOR	47,000 LB	$6,224	1.06	$37.58	$18.55	$4.50	M	1.00
144 CAT 315 EXCAVATOR	EXCAVATOR	37,000 LB	$5,558	1.06	$33.55	$12.25	$4.00	M	1.00
145 CAT 312B EXCAVATOR	EXCAVATOR	28,000 LB	$4,767	1.06	$28.78	$7.88	$3.50	M	1.00
146 CAT 385 EXC W/PRCESSR	EXCAVATOR WITH PROCESSOR		$34,234	1.06	$206.67	$63.00	$20.00	M	1.00
147 CAT 345 EXC W/LANG TOOL	EXCAVATOR WITH LANG TOOL		$25,000	1.06	$150.92	$38.85	$12.00	M	1.00
148 CAT 385 EXC W/BREAKER	EXCAVATOR WITH BREAKER		$29,344	1.06	$177.15	$63.00	$23.00	M	1.00
149 CAT 345 EXC W/BREAKER	EXCAVATOR WITH BREAKER		$20,550	1.06	$124.06	$38.85	$15.00	M	1.00
150 CAT 330 EXC W/BREAKER	EXCAVATOR WITH BREAKER		$14,104	1.06	$85.14	$30.45	$12.00	M	1.00
151 CAT 330 EXC W/THUMB	EXCAVATOR WITH THUMB		$12,597	1.06	$76.05	$30.45	$9.00	M	1.00
152 CAT 963 TRACK LOADER	TRACK LOADER	2.50 LCY	$9,263	1.06	$55. 2	$21. 0	$9. 0	M	1.00
153 CAT 953 TRACK LOADER	TRACK LOADER	2.00 LCY	$7,435	1.06	$44.88	$19.25	$7.00	M	1.00
154 CAT 933 TRACK LOADER	TRACK LOADER	1.00 LCY	$3,582	1.06	$21.62	$12.25	$7.00	M	1.00
155 CAT 966 WHEEL LOADER	WHEEL LOADER	5.00 LCY	$8,052	1.06	$48.61	$26.25	$6.00	M	1.00
156 CAT 950 WHEEL LOADER	WHEEL LOADER	4.00 LCY	$5,064	1.06	$30.57	$19.25	$5.00	M	1.00
157 CAT 924 WHEEL LOADER	WHEEL LOADER	2.50 LCY	$3,335	1.06	$20.13	$10.50	$5.00	M	1.00
158 CAT 657E SCRAPER	SCRAPER TANDE ıl PWR	44.00 LCY	$32,308	1.06	$195.04	$115.50	$13.00	M	1.00
159 CAT 627G SCRAPER	SCRAPER TANDE ıl PWR	22.00 LCY	$15,018	1.06	$90.66	$64.75	$11.00	M	1.00
160 CAT 623G SCRAPER	SCRAPER ELEVATING	23.00 LCY	$18,871	1.06	$113.92	$42.00	$10.00	M	1.00
161 CAT 613C SCRAPER	SCRAPER ELEVATING	11.00 LCY	$9,658	1.06	$58.30	$22.75	$9.00	M	1.00
162 WATER WAGON OH	WATER TANKER	6,000 GAL	$7,163	1.06	$43.24	$24.50	$8.00	M	1.00
163 CAT 16H GRADER	MOTOR GRADER	285 HP	$12,350	1.06	$74.56	$29.75	$6.00	M	1.00
164 CAT 14H GRADER	MOTOR GRADER	220 HP	$9,238	1.06	$55.77	$24.50	$5.00	M	1.00
165 CAT 140H GRADER	MOTOR GRADER	185 HP	$4,866	1.06	$29.38	$17.50	$4.00	M	1.00
166 CAT 120H GRADER	MOTOR GRADER	140 HP	$4,199	1.06	$25.35	$15.75	$3.00	M	1.00
167 CAT 740 OH TRUCK	ARTICULATED TRUCK	42 TON	$14,524	1.06	$87.68	$30.10	$7.00	M	1.00
168 CAT 730 OH TRUCK	ARTICULATED TRUCK	32 TON	$10,374	1.06	$62.63	$21.35	$6.00	M	1.00
169 CAT 725 OH TRUCK	ARTICULATED TRUCK	26 TON	$11,856	1.06	$71.57	$19.25	$5.00	M	1.00
170 CAT 824G COMPACTOR	SOIL COMPACTOR	63,000 LB	$12,548	1.06	$75.75	$52.50	$7.00	M	1.00
171 CAT 814F COMPACTOR	SOIL COMPACTOR	48,000 LB	$10,176	1.06	$61.43	$28.00	$5.00	M	1.00
172 CAT CS531D COMPACTOR	VIBRATORY ROLLER	84 INCH	$5,829	1.06	$35.19	$14.00	$3.00	M	1.00
173 CAT CS433E COMPACTOR	VIBRATORY ROLLER	50 INCH	$4,915	1.06	$29.67	$15.75	$2.50	M	1.00
174 TRENCH COMPACTOR	TRENCH COMPACTOR	24 INCH	$1,482	1.06	$8.95	$7.00	$1.00	M	1.00
175 CAT 446B BACKHOE	BACKHOE LOADER	20,000 LB	$4,644	1.06	$28.03	$14.00	$5.00	M	1.00

176	CAT 428D BACKHOE	BACKHOE LOADER		17,000 LB	$2,841	1.06	$17.15	$10.50	$4.00	M	1.00
177	CAT 416D BACKHOE	BACKHOE LOADER		15,000 LB	$2,594	1.06	$15.66	$10.50	$2.00	M	1.00
178	CAT 246 SKID STEER LOADER	1/2 CY	72 INCH	80 HP	$2,050	1.06	$12.38	$8.40	$4.00	M	1.00
179	CAT 216 SKID STEER LOADER	1/3 CY	66 INCH	50 HP	$1,284	1.06	$7.75	$5.95	$3.00	M	1.00
180	CAT CT18 HYDRO HAMMER	2000 FT-LB SKID STEE R ATTACHMENT			$1,581	1.06	$9.54	$0.00	$2.00	M	1.00
181	TRACTOR TRAILER	FLAT BED			$2,470	1.06	$14.91	$14.00	$3.00	M	1.00
182	CRANE, LATICE BOOM 80'	CRAWLER MOUNTED		350 TON	$36,161	1.06	$218.30	$17.50	$18.00	M	1.00
183	CRANE, LATICE BOOM 70'	CRAWLER MOUNTED		200 TON	$23,712	1.06	$143.15	$15.75	$14.00	M	1.00
184	CRANE, LATICE BOOM 60'	CRAWLER MOUNTED		100 TON	$18,772	1.06	$113.33	$14.00	$12.00	M	1.00
185	CRANE, HYDRAULIC 150 TN	TRUCK MOUNTED		150 TON	$19,958	1.06	$120.48	$14.00	$16.00	M	1.00
186	CRANE, HYDRAULIC 100 TN	TRUCK MOUNTED		100 TON	$13,634	1.06	$82.31	$10.50	$13.00	M	1.00
187	CRANE, HYDRAULIC 40 TN	TRUCK MOUNTED		40 TON	$7,138	1.06	$43.09	$8.75	$10.00	M	1.00
188	PORTABLE WATER TOWER			10,000 GAL	$1,803	1.06	$10.89	$0.00	$1.00	M	1.00
189	TANDEM DUMP TRUCK 16 TN			16 TON	$2,865	1.06	$17.30	$14.00	$2.00	M	1.00
190	TANDEM DUMP TRUCK 25 TN			25 TON	$4,174	1.06	$25.20	$15.75	$3.00	M	1.00
191	PICKUP TRUCK				$637	1.06	$3.85	$5.25	$1.00	M	1.00
192	LOWBOY TRUCK			75 TON	$1,976	1.06	$11.93	$17.50	$2.00	M	1.00
193	VAC TANKER TRUCK			5,000 GAL	$3,829	1.06	$23.11	$10.50	$5.00	M	1.00
194	AERIAL LIFT TRUCK			80 FT BOOM	$6,546	1.06	$39.51	$5.25	$1.00	M	1.00
195	TELESCOPIC BOOMLIFT 60 FT			60 FT BOOM	$4,347	1.06	$26.24	$5.25	$1.00	M	1.00
196	TELESCOPIC BOOMLIFT 40 FT			40 FT BOOM	$2,865	1.06	$17.30	$5.25	$1.00	M	1.00
197	BOOM FORKLIFT, 8000 LB			16 FT	$3,952	1.06	$23.86	$7.00	$2.00	M	1.00
198	TRACTOR W/ROME OFFSET DISC			14 FT WIDTH	$2,000	1.06	$12.07	$0.00	$1.00	M	1.00
199	ROLL OFF BOX				$741	1.06	$4.47	$0.00	$0.00	M	1.00
200	AIR COMPRESSOR 750 CFM			750 CFM	$2,100	1.06	$12.67	$14.00	$4.00	M	1.00
201	AIR COMPRESSOR 450 CFM			450 CFM	$1,457	1.06	$8.80	$10.50	$3.00	M	1.00
202	AIR COMPRESSOR 250 CFM			250 CFM	$934	1.06	$5.64	$7.00	$2.00	M	1.00
203	LIGHT TOWER W/GEN			4000 WATT	$874	1.06	$5.28	$10.50	$1.00	M	1.00
204	100 KW GENERATOR, DIESEL			100 KW	$1,161	1.06	$7.01	$17.50	$3.00	M	1.00
205	20 KW GENERATOR, DIESEL			20 KW	$667	1.06	$4.03	$7.00	$2.00	M	1.00
206	5 KW GENERATOR, GASOLINE			5 KW	$136	1.06	$0.82	$3.50	$1.00	M	1.00
207	6" TRASH PUMP		1,500 GP ıl MAX		$1,581	1.06	$9.54	$14.00	$3.00	M	1.00
208	3" TRASH PUMP		250 GPM MAX		$474	1.06	$2.86	$10.50	$2.00	M	1.00
209	2" TRASH PUMP		130 GPM MAX		$459	1.06	$2.77	$7.00	$1.00	M	1.00
210	STEAM CLEANER				$563	1.06	$3.40	$3.50	$1.00	M	1.00
211	BAKER TANK RENTAL			20,000 GAL	$988	1.06	$5.96	$0.00	$0.00	M	1.00
212	OXY & ACET CUTTING TORCH				$222	1.06	$1.34	$0.00	$1.00	M	1.00
213	WATER TRUCK			5,000 GAL	$4,644	1.06	$28.03	$3.50	$3.00	M	1.00
214	FLAT BED TRUCK				$1,136	1.06	$6.86	$14.00	$3.00	M	1.00
215	CHIPPER			600 HP	$3,977	1.06	$24.01	$59.50	$4.00	M	1.00
216	ROCK SCREENING UNIT				$4,650	1.06	$28.07	$24.50	$5.00	M	1.00
217	TRACTOR W/ BRUSH HOG				$500	1.06	$3.02	$0.00	$6.00	M	1.00
218	WATER TANK			10,000 GAL	$400	1.06	$2.41	$0.00	$1.00	M	1.00
219											

PROJECT:	**KRY HYDROCARBON LTU**	DATE:	02-Apr-12	**SHT 5 OF SHT 13**		
JOB NO.:	**60147138**					
CLIENT:	**BNSF**	TIME:	04:42 PM	SALES TAX RATE ON MAT'LS=======>	6.25%	
LOCATION:	**KALISPELL, MT**			SALES TAX RATE ON SUPPLIES=====>	6.25%	
		ESTIMATOR:	**TMK**	FINAL BUY ON MATERIALS==========>	0.00%	**(NEGATIVE NUMBER)**
				FINAL BUY ON SUBS================>	0.00%	**(NEGATIVE NUMBER)**

SUMMARY OF MATERIAL AND SUBCONTRACT PRICES USED IN CURRENT ESTIMATE

B	E	F	G	H	I	J	L	N	O
DESCRIPTION	QUANTITY	UNIT	QUOTED UNIT PRICE	SALES TAX PLUS FINAL BUY	UNIT PRICE WITH TAX	TOTAL PRICE	PLUGGED - P QUOTED - Q	NO. OF QUOTES RECEIVED	PRICE DIFF. BETWEEN LOW & SECOND
		PERMANENT MATERIAL PRICES							
399 SAND BEDDING		TNS	$12.00	1.06	$12.75	$0.00			
400 PERMANENT FENCE		LF	$12.00	1.06	$12.75	$0.00	Q		
401 4" CONDUIT		LF	$11.00	1.06	$11.69	$0.00	P		
402 4" PVC WATER LINE		LF	$10.00	1.06	$10.63	$0.00	P		
403 WATER METER		EA	$250.00	1.06	$265.63	$0.00	P		
404 POT BF PREVENTOR		EA	$500.00	1.06	$531.25	$0.00	P		
405 GATE VALVE		EA	$400.00	1.06	$425.00	$0.00	P		
406 LTU ANALYTICAL		LS	$140,010.00	1.06	$148,760.63	$0.00	Q		
407 FERTILIZER		LS	$172,900.00	1.06	$183,706.25	$0.00			
408				1.06	$0.00	$0.00			
		MAJOR SUPPLY PRICES:							
411 CRUSHED AGGREGATE		TNS	$15.00	1.06	$15.94	$0.00	P		
412 CONCRETE		CY	$97.00	1.06	$103.06	$0.00	Q		
413 REBAR		TNS	$900.00	1.06	$956.25	$0.00	P		
414 FORM MATERIALS		EA	$500.00	1.06	$531.25	$0.00	P		
415 SILT FENCE		LF	$0.21	1.06	$0.22	$0.00	Q		
416 CONSTRUCTION FENCE		LF	$0.36	1.06	$0.38	$0.00	Q		
417 DEBRIS DISPOSAL - NON HAZ		TNS	$20.00	1.06	$21.25	$0.00	P		
418 GRIP-TACK SPRAY ON LINER		GAL	$25.00	1.06	$26.56	$0.00	P		
419 TEMPORARY FENCE		LF	$ .00	1.06	$7.44	$ .00	P		
420 SOIL DISPOSAL (INORG)		TNS	$15.00	1.06	$15.94	$0.00	P		
421 SKIMMER PUMP		EA	$2,500.00	1.06	$2,656.25	$0.00	P		
422 NAPL TRANSPORT DISPOSAL		GAL	$3.00	1.06	$3.19	$0.00	P		
423 NON HAZ SLUDGE HAUL/RECYCLE		TNS	$44.00	1.06	$46.75	$0.00	Q		
424 SAND BAGS		EA	$0.98	1.06	$1.04	$0.00	Q		
425 DOUBLE SWING GATE		EA	$1,000.00	1.06	$1,062.50	$0.00	P		
426 15 MIL POLY LINER		SF	$0.05	1.06	$0.05	$0.00	Q		
427 3/8" PEA GRAVEL		TNS	$13.33	1.06	$14.16	$0.00	Q		
428 1/2" - 2 COARSE WASHED AGGREGATE		TNS	$11.33	1.06	$12.04	$0.00	Q		
429 WOVEN GEOTEXTILE		SF	$0.25	1.06	$0.27	$0.00	Q		
430 SAND BACKFILL (LINER PROTECTION)		TNS	$11.33	1.06	$12.04	$0.00	Q		
431 CLEAN STRUCTURAL FILL		TNS	$8.67	1.06	$9.21	$0.00	Q		
432 EARTHEN MATERIAL		TNS	$8.00	1.06	$8.50	$0.00	Q		
433 STEEL GRATING		EA	$500.00	1.06	$531.25	$0.00	P		
434 LTU IRRIGATION SYSTEM		EA	$37,700.00	1.06	$40,056.25	$0.00	Q		
435 55-GAL HDPE DRUM		EA	$100.00	1.06	$106.25	$0.00	P		
436 STOP SIGN		EA	$79.20	1.06	$84.15	$0.00	Q		
437 WARNING SIGN		EA	$6. 5	1.06	$7. 7	$0. 0	Q		
438 STAFF GAUGE		EA	$35.00	1.06	$37.19	$0.00	Q		
439 FLASH TAPE		ROLL	$28.00	1.06	$29.75	$0.00	Q		
440 PIPE LOCATOR TAPE		ROLL	$170.70	1.06	$181.37	$0.00	Q		
441 DEBRIS SCREEN		EA	$500.00	1.06	$531.25	$0.00	P		

442	FIRE EXTINGUISHER	EA	$39.97	1.06	$42.47	$0.00	Q
443	5HP PUMP	EA	$1,500.00	1.06	$1,593.75	$0.00	P
444	NON-WOVEN GEOTEXTILE	SF	$0.03	1.06	$0.03	$0.00	P
445	DEBRIS DISPOSAL - HAZ	TNS	$50.00	1.06	$53.13	$0.00	P
446	SLUDGE DISPOSAL - HAZ	TNS	$192.00	1.06	$204.00	$0.00	Q
447	NAPL SOIL TRANSPORT DISPOSAL	TNS	$44.00	1.06	$46.75	$0.00	Q
448	PCP LTU MECH MATLS	LS	$61,650.00	1.06	$65,503.13	$0.00	Q
449	HYD LTU MECH MATLS	LS	$25,000.00	1.06	$26,562.50	$0.00	Q
450	PUMP REPLACEMENT	EA	$10,000.00	1.06	$10,625.00	$0.00	Q
451	IRRIGATION SYSTEM REPAIRS	EA	$10,000.00	1.06	$10,625.00	$0.00	Q
452				1.06	$0.00	$0.00	
		SUBCONTRACT PRICES:					
455	EXECUTION PLAN	EA	$5,000.00	1.00	$5,000.00	$0.00	P
456	HASP	EA	$2,500.00	1.00	$2,500.00	$0.00	P
457	PERMITS	EA	$5,000.00	1.00	$5,000.00	$0.00	P
458	EQUIPMENT MOB/DEMOB	EA	$1,000.00	1.00	$1,000.00	$0.00	P
459	ASPHALT ROADWAY	SF	$20.00	1.00	$20.00	$0. 0	P
460	WELL ABANDONMENT	LF	$9.50	1.00	$9.50	$0.00	Q
461	NORTHWEST ENERGY	LS	$986,200.00	1.00	$986,200.00	$0.00	Q
462	WESTERN GAS LINE INSTALL	LS	$12,000.00	1.00	$12,000.00	$0.00	P
463	WESTERN ELECTRICAL LINE	LS	$8,000.00	1.00	$8,000.00	$0.00	P
464	RAIL LINE REMOVAL/INSTALL	LS	$185,000.00	1.00	$185,000.00	$0.00	Q
465	GEOCOMPOSITE CLAY LINER	SF	$0.60	1.00	$0.60	$0.00	Q
466	60 MIL HDPE LINER	SF	$0.60	1.00	$0.60	$0.00	Q
467	GEOCOMPOSITE DRAINAGE LAYER	SF	$0.60	1.00	$0.60	$0.00	Q
468	40 MIL HDPE LINER	SF	$0.50	1.00	$0.50	$0.00	Q
469	40 MIL LDPE LINER	SF	$0.48	1.00	$0.48	$0.00	Q

PROJECT: **KRY HYDROCARBON LTU** DATE: 02-Apr-12 **SHT 6 OF SHT 13**
JOB NO.: **60147138**
CLIENT: **BNSF** TIME: 04:42 PM
LOCATION: **KALISPELL, MT**
ESTIMATOR: **TMK**

FIXED COST JOBSITE OVERHEADS **(UP FRONT, ONE TIME COSTS TO THE PROJECT)**

	DESCRIPTION	REQUIRED Y OR N	REQUIRED QUANTITY	UNIT RATE	I LABOR	J INT EQUIP	K EXT EQUIP	L FUEL	M REPAIRS	N SUPPLIES	O SUBS	P TRAVEL	Q TOTALS
	*******SITE UTILITY HOOKUPS*******												
239	ELECTRIC			$2,500							0		0
240	WATER (NO METER VLT OR BKFLW PRVNTR)			$500							0		0
241	SEWER			$2,500							0		0
242	GAS			$2,500							0		0
243	TELEPHONE			$350							0		0
244											0		0
245											0		0
	*******INITIAL HEALTH AND SAFETY COSTS*******												
247	PHYSICALS			$1,300						0			0
248	TRAINING CLASS COSTS-EXTERNAL			$700							0		0
249	TRAINING CLASS COSTS-INTERNAL			$450						0			0
250	INITIAL H & S PURCHASES			$1,500						0			0
251										0			0
252										0			0
	*******INSURANCE AND TAXES*******												
254	CLIENT NAMED AS ADDITIONAL INSURED			$0						0			0
255	BUILDERS RISK INSURANCE (0.60 % OF REV.)									0			0
256	POLLUTION LIABILITY INSURANCE									0			0
257	SPECIAL TAXES									0			0
258										0			0
259										0			0
	*******SITE OFFICE EQUIPMENT*******												
261	OFFICE FURNITURE (PER UNIT)			$100						0			0
262	FAX MACHINE			$400						0			0
263	COMPUTER			$2,000						0			0
264	COMPUTER SOFTWARE			$500						0			0
265										0			0
266										0			0
	*******MISCELLANEOUS COSTS*******												
268	PERMITS			$100						0			0
269	ROYALITIES ON PROCESSES									0			0
270	TEMPORARY FENCING			$2						0			0
271	MOVING EXPENSES (LONG TERM PROJECT)									0			0
272	PROJECT SIGN			$150						0			0
273										0			0
274										0			0
	TOTAL FIXED OVERHEADS				0	0	0	0	0	0	0	0	0

PROJECT: **KRY HYDROCARBON LTU** DATE: 02-Apr-12 **SHT 7 OF SHT 13**
JOB NO.: **60147138**
CLIENT: **BNSF** TIME: 04:42 PM
LOCATION: **KALISPELL, MT**
ESTIMATOR: **TMK** PROJECT DURATION = 1.0 WEEKS

VARIABLE COST JOBSITE OVERHEADS **(WEEKLY COSTS ASSOCIATED WITH MANAGEMENT OF THE PROJECT)**

DESCRIPTION	REQUIRED Y OR N	REQUIRED QUANTITY	DURATION	UNIT RATE	I TOTAL LABOR	J WEEKLY LABOR	K WEEKLY INT EQUIP	L WEEKLY EXT EQUIP	M WEEKLY FUEL	N WEEKLY REPAIRS	O WEEKLY SUPPLIES	P WEEKLY SUBS	Q WEEKLY TRAVEL	Q WEEKLY TOTALS
*******FULL TIME EXEMPT*******														
294 PROJECT MANAGER			1.0	$2,904	0	0	0		0	0			0	0
295 SUPERINTENDENT			1.0	$2,687	0	0	0		0	0			0	0
296 PROJ. ENGINEER			1.0	$2,033	0	0	0		0	0			0	0
297 H&S OFFICER			1.0	$1,676	0	0	0		0	0			0	0
298			1.0											0
*******FULL TIME NON-EXEMPT*******														
301 AST. PROJ. ENG.			1.0	$2,392	0	0							0	0
302 FIELD ENGINEER			1.0	$2,392	0	0	0		0	0			0	0
303 ENGINEER TECH.			1.0	$1,841	0	0							0	0
304 H&S TECHNICIAN			1.0											0
305			1.0											0
*******LOCAL HOURLY*******														
308 FIELD FORMAN (L)			1.0	$3,142	0	0							0	0
309 MECHANIC(L)			1.0	$3,844	0	0		0					0	0
310 OILER (L)			1.0	$3,428	0	0							0	0
311 CLERK (L)			1.0	$884	0	0							0	0
312			1.0											0
*******CORE HOURLY*******														
315 FIELD FOREMAN(C)			1.0	$0	0	0							0	0
316 MECHANIC(C)			1.0	$0	0	0		0					0	0
317 GRADE CHECKER (C)			1.0	$0	0	0							0	0
318														0
*******SERVICES DIVISION UNION HOURLY*******														
321 FOREMAN (SU)			1.0	$0	0	0							0	0
322														0
*******INTERNAL EQUIPMENT RENTAL*******														
325 PRESSURE WASHER (INTERNAL RATE)			1.0	$30			0							0
326 SAFETY EQUIPMENT (AIR SAMPLING/OVA)			1.0	$500			0							0
327			1.0				0							0
328			1.0				0							0
*******EXTERNAL EQUIPMENT RENTAL*******														
331 OFFICE TRAILER			1.0	$200				0						0
332 TOOL TRAILER			1.0	$75				0						0
333 CHANGE TRAILER			1.0	$100				0						0
334 DECONTAMINATION TRAILER			1.0	$250				0						0
335 LAB TRAILER			1.0	$100				0						0
336 FUEL TRUCK			1.0	$200				0						0
337 GREASE TRUCK			1.0	$200				0						0
338 MISC. EQUIP			1.0	$75				0						0
339 SITE SCALES			1.0	$2,000				0						0
340 PROJECT VEHICLES			1.0	$150				0	0	0				0
341 STREET SWEEPER			1.0	$400				0						0
342 JOBSITE PHOTOS			1.0	$25				0						0
343 WATER TRUCK			1.0	$250				0						0
344			1.0					0						0
345			1.0					0						0
*******SUPPLIES*******														
348 OFFICE SUPPLIES			1.0	$50							0			0

349	SURVEY SUPPLIES			1.0	$50						0			0
350	SAFETY SUPPLIES			1.0	$200						0			0
351	COPY MACHINE			1.0	$40						0			0
352	PHONE SERVICE			1.0	$150						0			0
353	UTILITY SERVICES			1.0	$40						0			0
354	POTABLE WATER			1.0	$40						0			0
355	SANITARY FACILITIES			1.0	$30						0			0
356	SMALL TOOLS			1.0	$150						0			0
357	JOBSITE PHOTOS			1.0	$15						0			0
358	ON-SITE QC TESTING EQUIP.			1.0	$200						0			0
359	ON SITE LAB SUPPLIES			1.0	$500						0			0
360	DECONTAMINATION SUPPLIES			1.0	$75						0			0
361	WATER (DUST CONTROL)			1.0	$70						0			0
362				1.0							0			0
*******SUBCONTRACTS*******														
365	SURVEY CREW (BASED ON $90/HR FOR 40 HRS)			1.0	$3,600							0		0
366	SECURITY (FULL TIME AT $12/HOUR)			1.0	$2,016							0		0
367				1.0								0		0
368				1.0								0		0
*******TRAVEL COSTS*******														
371	TRAVEL, EXECUTIVE			1.0	$250								0	0
372				1.0									0	0
373				1.0									0	0
	VARIABLE JOBSITE OVERHEADS	(WEEKLY)				0	0	0	0	0	0	0	0	0
	VARIABLE JOBSITE OVERHEADS	(TOTAL)	1 WEEKS			0	0	0	0	0	0	0	0	0

PROJECT:	**KRY HYDROCARBON LTU**	ESTIMATOR:	**TMK**	SHT 8 OF	**SHT 13**
JOB NO.:	**60147138**				
CLIENT:	**BNSF**	DATE:	02-Apr-12	TIME:	04:42 PM
LOCATION:	**KALISPELL, MT**				
ITEM DESCRIPTION:	HYDROCARBON LTU CONSTRUCT			BIDFORM QUANTITY:	1 LS
				TAKE-OFF QUANTITY:	1 LS

ESTIMATOR NOTES AND ASSUMPTIONS:
Hydrocarbon LTU - 87,000 sf, retention pond - 21,000 sf.
Area graded - 4 days with D6 dozer, grader, water truck and compactor. Place 4" clean structural fill below liner - 1600 tns.
1700 cy cut and 1300 cy fill to grade area after 18,000 cy of fill placed to backfill excavation. This work is completed under a separate task.
Area lined with 40 mil HDPE liner, geocomposite drainage layer and 6" sand protective layer.
Install a gravel path adjacent to LTU for operation of irrigation system - 1 day.
Liners installed by subcontractors and are installed costs.
5 days for dozer to spread sand layer.
Pump, piping and collection systems installed with backhoe, 2 laborers, 2 pipefitters and 1 electrician - 5 days.

DURATION = 50 HOURS

DESCRIPTION	QUANTITY	UNIT	LABOR	INT EQUIP	EXT EQUIP	FUEL	REPAIRS	SUPPLIES	MATERIALS	SUBS	TRAVEL	TOTAL	UNIT COST
CAT D6 DOZER	1.00	EA	49.45		57.56	21.00	8.00				0.00		
CAT 140H GRADER	1.00	EA	49.45		29.38	17.50	4.00				0.00		
CAT CS433E COMPACTOR	1.00	EA	49.45		29.67	15.75	2.50				0.00		
WATER TRUCK	1.00	EA	49.45		28.03	3.50	3.00				0.00		
COMMON LABORER (L)	4.00	EA	197.51								0.00		
CAT 416D BACKHOE	1.00	EA	49.45		15.66	10.50	2. 0				0. 0		
ELECTRICIAN (L)	1.00	EA	73.10								0.00		
PIPE FITTER (L)	2.00	EA	154.85								0.00		
CAT D5LGP DOZER	1.00	EA	49.45		48.09	15.75	6.00				0.00		
CREW			722.17	0.00	208.39	84.00	25.50	0.00	0.00	0.00	0.00	HOURLY CREW COSTS	1,040.06
SUBTOTAL	50	HOURS	36,109	0	10,420	4,200	1,275	0	0	0	0	52,004	52,004.00
MATERIALS:													
40 MIL HDPE LINER	108,000	SF								54,000		54,000	
GEOCOMPOSITE DRAINAGE LAY	87,000	SF								52,200		52,200	
SAND BACKFILL (LINER PROTECT	1,500	TNS						18,060				18,060	
WOVEN GEOTEXTILE	4,500	SF						1,215				1,215	
CRUSHED AGGREGATE	90	TNS						1,435				1,435	
3/8" PEA GRAVEL	150	TNS						2,124				2,124	
NON-WOVEN GEOTEXTILE	3,400	SF						102				102	
LTU IRRIGATION SYSTEM	1	EA						40,056				40,056	
HYD LTU MECH MATLS	1	LS						26,563				26,563	
CLEAN STRUCTURAL FILL	1,600	TNS						14,736				14,736	
												0	
												0	
TOTALS			36,109	0	10,420	4,200	1,275	104,290	0	106,200	0	262,494	262,494.35
											Horizontal Check:	262,494	

PROJECT:	**KRY HYDROCARBON LTU**	ESTIMATOR:	**TMK**	SHT 9 OF	**SHT 13**
JOB NO.:	**60147138**				
CLIENT:	**BNSF**	DATE:	02-Apr-12	TIME:	04:42 PM
LOCATION:	**KALISPELL, MT**				
ITEM DESCRIPTION:	SOIL SCREENING			BIDFORM QUANTITY:	8,300 BCY
				TAKE-OFF QUANTITY:	8,300 BCY

ESTIMATOR NOTES AND ASSUMPTIONS:
Type E soil requires screening before before placement in the LTUs - 8,300 bcy (9,960 cy with 20% bulking) - 15,000 tns (1.5 tns/lcy).
Assume a screening rate of 2000 cy (3000 tns) per day - 5 days.
2 loaders, 1 to feed screening unit and 1 to loadout or stockpile screened material.

DURATION = 50 HOURS

DESCRIPTION	QUANTITY	UNIT	LABOR	INT EQUIP	EXT EQUIP	FUEL	REPAIRS	SUPPLIES	MATERIALS	SUBS	TRAVEL	TOTAL	UNIT COST
CAT 950 WHEEL LOADER	2.00	EA	98.91		61.14	38.50	10.00				0.00		
ROCK SCREENING UNIT	1.00	EA	49.45		28.07	24.50	5.00				0.00		
COMMON LABORER (L)	2.00	EA	98.76								0.00		
MECHANIC(L)	1.00	EA	64.07								0.00		
CREW			311.19	0.00	89.21	63.00	15.00	0.00	0.00	0.00	0.00	HOURLY CREW COSTS	478.40
SUBTOTAL	50	HOURS	15,559	0	4,461	3,150	750	0	0	0	0	23,920	2.88
MATERIALS:													
												0	
												0	
												0	
												0	
												0	
												0	
												0	
												0	
												0	
												0	
												0	
												0	
TOTALS			15,559	0	4,461	3,150	750	0	0	0	0	23,920	2.88

Horizontal Check: 23,920

PROJECT:	**KRY HYDROCARBON LTU**	ESTIMATOR:	**TMK**	SHT 10 OF	**SHT 13**
JOB NO.:	**60147138**				
CLIENT:	**BNSF**	DATE:	02-Apr-12	TIME:	04:42 PM
LOCATION:	**KALISPELL, MT**				
ITEM DESCRIPTION:	LOAD SOIL TO LTU			BIDFORM QUANTITY:	8,300 BCY
				TAKE-OFF QUANTITY:	8,300 BCY

ESTIMATOR NOTES AND ASSUMPTIONS:
15,000 tns of soil to be transported and placed in the LTUs.
Assume 4000 cy (6000 tns) per day production = 3 days.
Place soil in LTU by spreading with a LGP dozer.

DURATION = 30 HOURS

DESCRIPTION	QUANTITY	UNIT	LABOR	INT EQUIP	EXT EQUIP	FUEL	REPAIRS	SUPPLIES	MATERIALS	SUBS	TRAVEL	TOTAL	UNIT COST
CAT 950 WHEEL LOADER	1.00	EA	49.45		30.57	19.25	5.00				0.00		
TANDEM DUMP TRUCK 25 TN	4.00	EA	197.81		100.80	63.00	12.00				0.00		
CAT D5LGP DOZER	2.00	EA	98.91		96.18	31.50	12.00				0.00		
COMMON LABORER (L)	3.00	EA	148.13								0.00		
CREW			494.30	0.00	227.55	113.75	29.00	0.00	0.00	0.00	0.00	HOURLY CREW COSTS	864.60
SUBTOTAL	30	HOURS	14,829	0	6,827	3,413	870	0	0	0	0	25,939	3.13
MATERIALS:													
												0	
												0	
												0	
												0	
												0	
												0	
												0	
												0	
												0	
												0	
												0	
TOTALS			14,829	0	6,827	3,413	870	0	0	0	0	25,939	3.13
											Horizontal Check:	25,939	

PROJECT:	**KRY HYDROCARBON LTU**	ESTIMATOR:	**TMK**	SHT 11 OF	**SHT 13**
JOB NO.:	**60147138**				
CLIENT:	**BNSF**	DATE:	02-Apr-12	TIME:	04:42 PM
LOCATION:	**KALISPELL, MT**				
ITEM DESCRIPTION:	HYDROCARBON LTU TILLING			BIDFORM QUANTITY:	1 LS
				TAKE-OFF QUANTITY:	1 LS

ESTIMATOR NOTES AND ASSUMPTIONS:
Assume tilling of the Hydrocarbon LTU once every 2 weeks from April through October. One 8-hr day for the Hydrocarbon LTU. Includes time to decon equipment.
Additional laborer to operate irrigation system weekly for remaining weeks when tilling does not occur.
Each LTU has six 1-foot lifts. Each lift requires 2 years of treatment.
1440 total hrs
Assume pump system replacement every 5 years - 2 each, 2 pumps - 4 each.
Assume irrigation system repairs every 5 years - 2 each.
Fertilizer - 7600 BCY soil with rock removed, 13,700 tns soil, amendment at 1.8% = 247 tns = $172,900 at $0.35/lb plus tax.

DURATION = 1,440 HOURS

DESCRIPTION	QUANTITY	UNIT	LABOR	INT EQUIP	EXT EQUIP	FUEL	REPAIRS	SUPPLIES	MATERIALS	SUBS	TRAVEL	TOTAL	UNIT COST
TRACTOR W/ROME OFFSET DISC	1.00	EA	49.45		12.07	0.00	1.00				0.00		
LOWBOY TRUCK	1.00	EA	49.45		11.93	17.50	2.00				0.00		
COMMON LABORER (L)	1.00	EA	49.38								0.00		
CREW			148.28	0.00	24.00	17.50	3.00	0.00	0.00	0.00	0.00	HOURLY CREW COSTS	192.78
SUBTOTAL	1,440	HOURS	213,528	0	34,560	25,200	4,320	0	0	0	0	277,608	277,608.00
MATERIALS:													
LTU ANALYTICAL	1	LS							148,761			148,761	
FERTILIZER	1	LS							183,706			183,706	
PUMP REPLACEMENT	4	EA						42,500				42,500	
IRRIGATION SYSTEM REPAIRS	2	EA						21,250				21,250	
												0	
												0	
												0	
												0	
												0	
												0	
												0	
												0	
TOTALS			213,528	0	34,560	25,200	4,320	63,750	332,467	0	0	673,825	673,824.88
											Horizontal Check:	673,825	

PROJECT:	**KRY HYDROCARBON LTU**	ESTIMATOR:	**TMK**	SHT 12 OF	**SHT 13**
JOB NO.:	**60147138**				
CLIENT:	**BNSF**	DATE:	02-Apr-12	TIME:	04:42 PM
LOCATION:	**KALISPELL, MT**				
ITEM DESCRIPTION:	LOADOUT HYDROCARBON LTU			BIDFORM QUANTITY:	12,500 TNS
				TAKE-OFF QUANTITY:	12,500 TNS

ESTIMATOR NOTES AND ASSUMPTIONS:
15,000 tns of soil loaded into the hydrocarbon LTU in six 1-foot lifts. The top 5 lifts get removed after treatment, the last lift remains for closure in place. 12,500 tns of treated soil loaded out and backfilled onsite.
Assume 5 events, approximately 2500 tns each. Assume 1500 tns per day = 2 days, 10 days total
Dozer and track loader to load soil to trucks and haul to backfill location.
Dozer, compactor and water truck.to place backfill

DURATION = 100 HOURS

DESCRIPTION		QUANTITY	UNIT	LABOR	INT EQUIP	EXT EQUIP	FUEL	REPAIRS	SUPPLIES	MATERIALS	SUBS	TRAVEL	TOTAL	UNIT COST
CAT D6 DOZER		1.00	EA	49.45		57.56	21.00	8.00				0.00		
CAT D5LGP DOZER		1.00	EA	49.45		48.09	15.75	6.00				0.00		
CAT 953 TRACK LOADER		1.00	EA	49.45		44.88	19.25	7.00				0.00		
CAT 824G COMPACTOR		1.00	EA	49.45		75.75	52.50	7.00				0.00		
WATER TRUCK		1.00	EA	49.45		28.03	3.50	3.00				0.00		
COMMON LABORER (L)		2.00	EA	98.76								0. 0		
PICKUP TRUCK	*	3.00	EA			11.55	15.75	3.00						
SUPERINTENDENT		1.00	EA	44.78								14.73		
CREW				390.80	0.00	265.86	127.75	34.00	0.00	0.00	0.00	14.73	HOURLY CREW COSTS	833.13
SUBTOTAL		100	HOURS	39,080	0	26,586	12,775	3,400	0	0	0	1,473	83,314	6.67
MATERIALS:														
EQUIPMENT MOB/DEMOB		25	EA								25,000		25,000	
													0	
													0	
													0	
													0	
													0	
													0	
													0	
													0	
													0	
													0	
													0	
TOTALS				39,080	0	26,586	12,775	3,400	0	0	25,000	1,473	108,314	8.67
												Horizontal Check:	108,314	

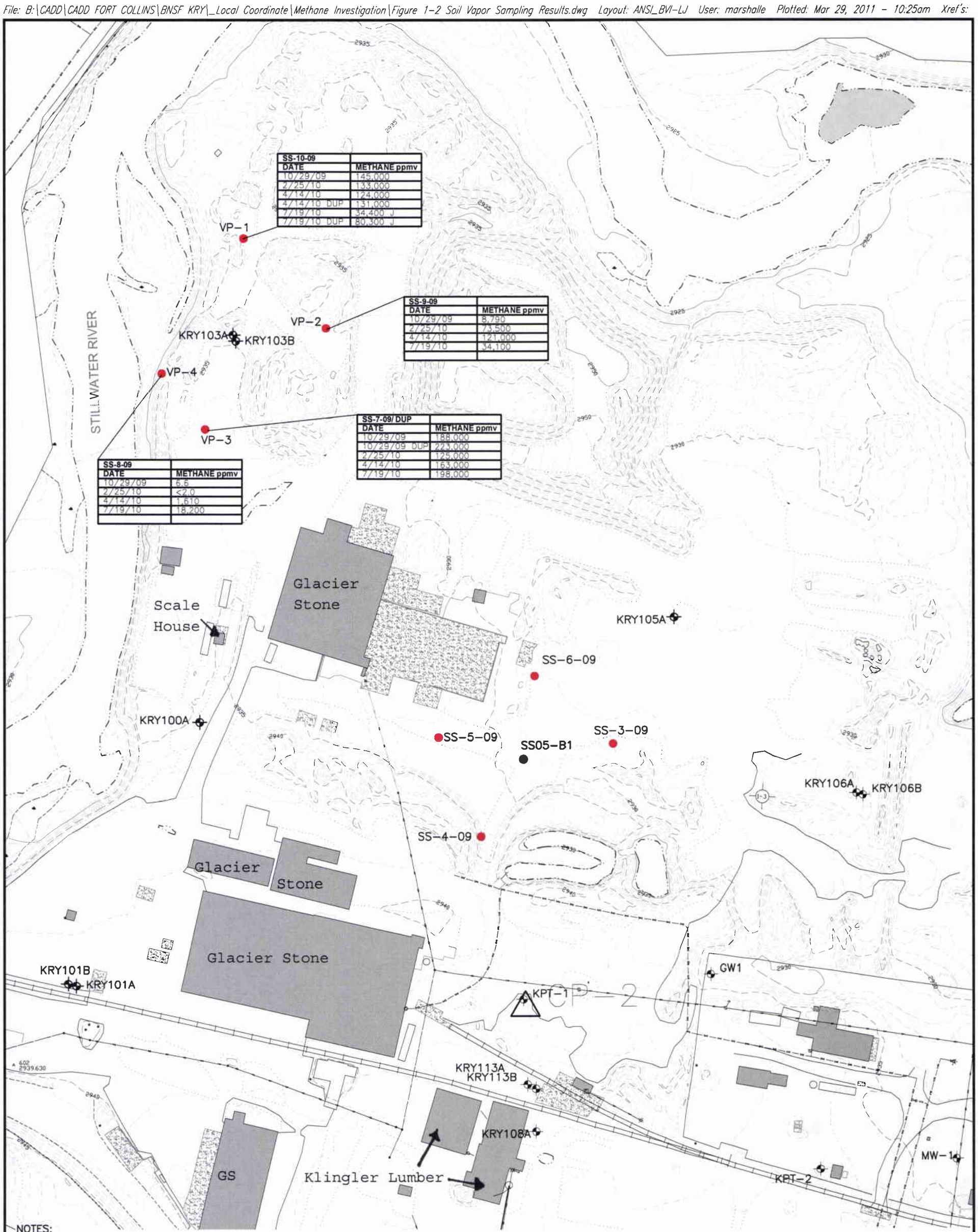
PROJECT:	**KRY HYDROCARBON LTU**	ESTIMATOR:	**TMK**	SHT 13 OF	**SHT 13**
JOB NO.:	**60147138**				
CLIENT:	**BNSF**	DATE:	02-Apr-12	TIME:	04:42 PM
LOCATION:	**KALISPELL, MT**				
ITEM DESCRIPTION:	LTU CLOSURE			BIDFORM QUANTITY:	1 LS
				TAKE-OFF QUANTITY:	1 LS

ESTIMATOR NOTES AND ASSUMPTIONS:
Close LTU in place by perforating liners with an excavator bucket and regrading berm soils to match existing grades.
LTU approximately 100,000 sf combined. Assume liner perforated in 3 days.
Regrade in 3 days with a dozer and grader.
Collection pipe, conveyance pipe, irrigation systems and pump systems removed and disposed as non-haz debris. Assume 4 days for a backhoe and 2 laborers.

DURATION = 30 HOURS

DESCRIPTION		QUANTITY	UNIT	LABOR	INT EQUIP	EXT EQUIP	FUEL	REPAIRS	SUPPLIES	MATERIALS	SUBS	TRAVEL	TOTAL	UNIT COST
CAT D6 DOZER		2.00		98.91		115.12	42.00	16.00				0.00		
CAT 330 EXCAVATOR		1.00		49.45		63.22	30.45	6.00				0.00		
CAT 14H GRADER		1.00		49.45		55.77	24.50	5.00				0.00		
CAT 416D BACKHOE		1.00		49.45		15.66	10.50	2.00				0.00		
COMMON LABORER (L)		4.00		197.51								0.00		
PICKUP TRUCK	*	3. 0				11.55	15.75	3. 0						
ROLL OFF BOX	*	2.00				8.94	0.00	0.00						
SUPERINTENDENT		1.00		44.78								14.73		
CREW				489.55	0.00	270.26	123.20	32.00	0.00	0.00	0.00	14.73	HOURLY CREW COSTS	929.74
SUBTOTAL		30	HOURS	14,687	0	8,108	3,696	960	0	0	0	442	27,893	27,893.00
MATERIALS:														
DEBRIS DISPOSAL - NON HAZ		25	TNS						531				531	
EQUIPMENT MOB/DEMOB		4	EA								4,000		4,000	
													0	
													0	
													0	
													0	
													0	
													0	
													0	
													0	
													0	
													0	
TOTALS				14,687	0	8,108	3,696	960	531	0	4,000	442	32,424	32,424.25
												Horizontal Check:	32,424	

APPENDIX B



NOTES:

1. BASEMAP INFORMATION WAS OBTAINED FROM THE TD&H JUNE 2010 SITE GROUND SURVEY.
2. UTILITY LINES WERE TAKEN FROM A PREVIOUS UTILITY SURVEY MAP, CONVERTED WITH SCALE FACTOR OF 1.000535286 AND ADDED TO THIS GROUND SURVEY BASEMAP.
3. ALL WELLS, BORINGS, TEST PITS LOCATIONS ETC. WERE CONVERTED WITH SCALE FACTOR OF 1.000535286 AND ADDED TO THIS GROUND SURVEY BASEMAP.

SCALE IN FEET

LEGEND

VP-1-09	SOIL GAS MONITORING WELL
SS-3-09	SURFACE SOIL LOCATIONS
	MONITORING WELL
	HISTORIC SURFACE SOIL LOCATION
	BUILDING
	FENCE
GAS	GAS UTILITY LINE
VTR	WATER UTILITY LINE
EOH	ELECTRIC OVERHEAD UTILITY LINE
EUG	ELECTRIC UNDERGROUND UTILITY LINE

ppmv = PARTS PER MILLION BY VOLUME

	CONTOUR MINOR
2930	CONTOUR MAJOR
	PROPERTY LINE
	KRY SITE BOUNDARY
	TRAIL
	ROAD
	RAILROAD

50 0 100

Modified From:AECOM. 2011a. Work Plan for Methane Investigation,KRY Site, Kaslispell, Montana. July.

KRY SITE
KALISPELL, MONTANA
(60147138-2.250)

DATE: 3/29/11 DRWN: EM/FTC

SOIL VAPOR
SAMPLING RESULTS

FIGURE 1-2

APPENDIX C

Table 2-3a: Soil Vapor Results
BNSF KRY Site - Kalispell, Montana

Sample ID	Date	Methane ppmv	CO_2 %	LEL %	O_2 %	Methane (field) %	Temp °F	Barometric Pressure (inHg)	Relative Pressure (inHg)
VP-1-09	10/29/2009	145,000	13.1	>100	5.3	13.1	30	27.10	NM
VP-2-09	10/30/2009	8,790	-	-	-	-	-	-	NM
VP-3-09	10/29/2009	188,000	27.2	>100	2.0	16.4	30	27.00	NM
VP-3-09 Duplicate	10/29/2009	223,000	27.2	>100	2.0	16.4	30	27.00	NM
VP-4-09	10/29/2009	6.6	16.6	2	8.5	0.1	35	27.04	NM
KRY-100A	10/29/2009	NM	0.9	1	18.7	0.0	25	26.91	NM
KRY-101A	10/29/2009	NM	4.6	1	10.9	0.0	25	26.91	NM
KRY-103A	10/29/2009	NM	23.1	>100	1.5	6.8	25	26.91	NM
KRY-105A	10/29/2009	NM	20.5	>100	4.1	13.7	25	26.91	NM

Note:
% - Percent
> - Greater Than
°F - degrees Fahrenheit
ID - Identification
NM - Not Measured
PID readings not collected due to malfunctioning meter.
CO_2 - Carbon dioxide
LEL - Lower explosive limit
O_2 - Oxygen
Temp - Temperature

AECOM.2011. KRY Site Sawdust Investigation Report Rev, 1 Kalispell, Montana. April 6.

Table 2-3b: Soil Vapor Results
BNSF KRY Site - Kalispell, Montana

Sample ID	Date	Methane ppmv	CO_2 %	LEL %	O_2 %	Methane (field) %	Temp °F	Barometric Pressure (inHg)	Relative Pressure (inHg)
VP-1-09	2/25/2010	133,000	23.1	>100	1.4	11.8	40	27.02	NM
VP-2-09	2/25/2010	73,500	21.9	>100	0.7	6.5	40	27.02	NM
VP-3-09	2/25/2010	125,000	22.6	77	0.0	10.3	40	27.03	NM
VP-4-09	2/25/2010	< 2.0	8.1	0.0	13.1	0.0	40	27.02	NM

Note:
% - Percent
> - Greater Than
°F - degrees Fahrenheit
ID - Identification
NM - Not Measured
PID readings not collected due to malfunctioning meter.
CO_2 - Carbon dioxide
LEL - Lower explosive limit
O_2 - Oxygen
Temp - Temperature

Table 2-3c: Soil Vapor Results
BNSF KRY Site - Kalispell, Montana

Sample ID	Date	Methane ppmv	CO_2 %	LEL %	O_2 %	Methane (field) %	Temp °F	Barometric Pressure (inHg)	Relative Pressure (inHg)
VP-1-09	4/14/2010	124,000	22.9	>100%	1.0	11.0	40	26.88	NM
VP-2-09	4/14/2010	121,000	19.1	0.0	2.0	0.0	40	26.91	NM
VP-3-09	4/14/2010	163,000	21.5	>100	1.0	13.2	40	26.91	NM
VP-4-09	4/14/2010	1,610	10	0.0	14.1	0.0	40	26.90	NM
VP-5-09 (duplicate of VP-	4/14/2010	131,000	22.9	>100%	1.0	11.0	40	26.88	NM

Note:
% - Percent
> - Greater Than
°F - degrees Fahrenheit
ID - Identification
NM - Not Measured
PID readings not collected due to malfunctioning meter.
CO_2 - Carbon dioxide
LEL - Lower explosive limit
O_2 - Oxygen
Temp - Temperature

Table 2-3d: Soil Vapor Results
BNSF KRY Site - Kalispell, Montana

Sample ID	Date	Methane ppmv	CO_2 %	LEL %	O_2 %	Methane (field) %	Temp °F	Barometric Pressure (inHg)	Relative Pressure (inHg)
VP-1-09	7/19/2010	34,400 J	27.2	>100%	1.4	13.1	72	26.98	000.90
VP-2-09	7/19/2010	34,100	26.4	78%	2.1	6.3	72	26.96	001.37
VP-3-09	7/19/2010	198,000	22.2	>100%	1.0	18.3	72	26.96	003.32
VP-4-09	7/19/2010	18,200	22.0	32%	0.9	1.6	72	26.98	00.05
VP-5-09 (Duplicate of VP-	7/19/2010	80,300 J	27.2	>100%	1.4	13.1	72	26.98	000.90

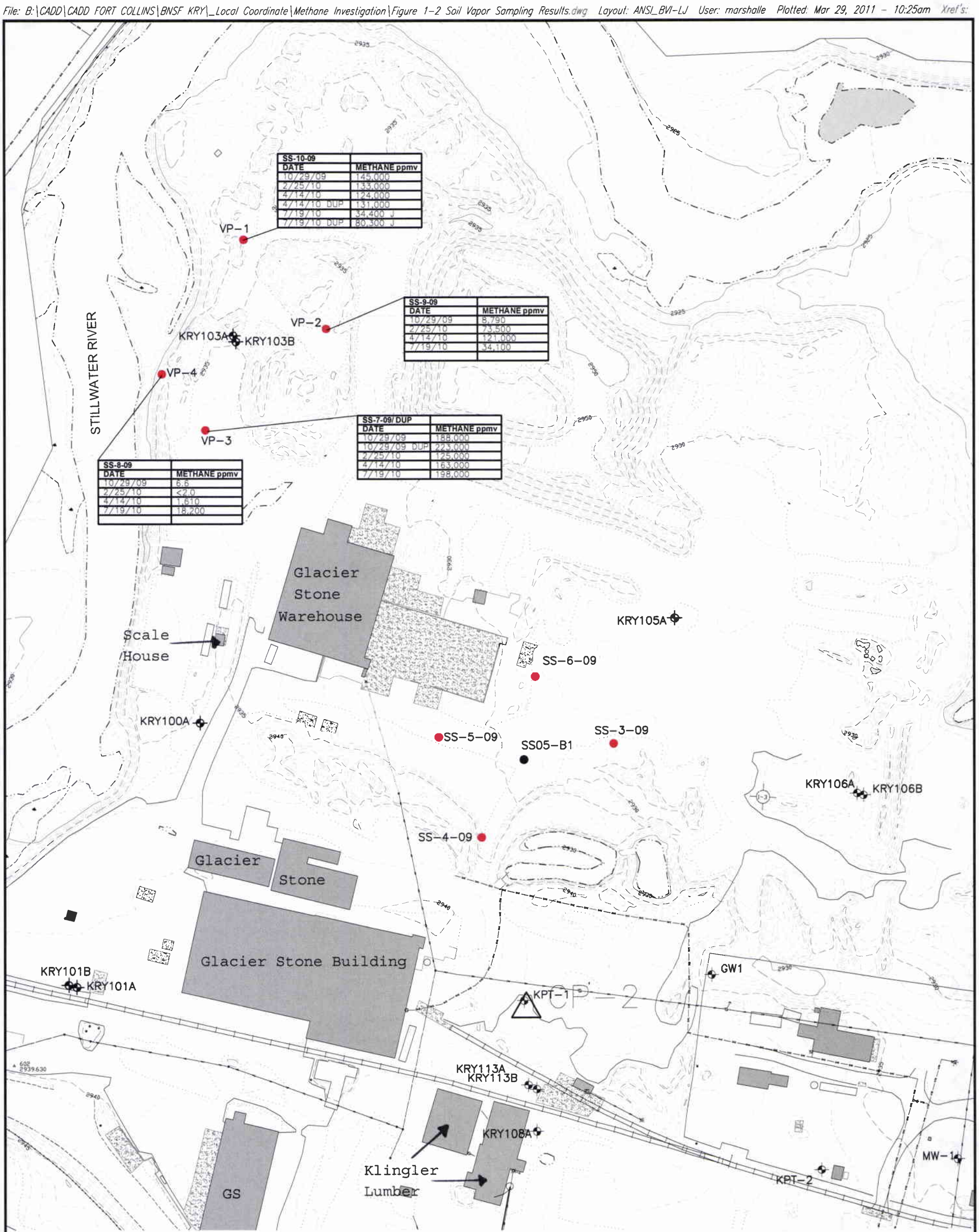
Note:
% - Percent
> - Greater Than
°F - degrees Fahrenheit
ID - Identification
NM - Not Measured
PID readings not collected due to malfunctioning meter.
CO_2 - Carbon dioxide
LEL - Lower explosive limit
O_2 - Oxygen
Temp - Temperature

Table 2-5: Groundwater Chemistry
BNSF KRY Site - Kalispell, Montana

Sample ID		**VP-1-09**	**VP-2-09**	**VP-3-09**	**VP-4-09**	**KRY-100A**	**KRY-100A Duplicate**	**KRY-101A**	**KRY-103A**	**KRY-105A**
Date		**10/26/2009 - 10-28-09**	**10/27/2009**	**10/26/2009**	**10/26/2009**	**10/27/2009**	**10/27/2009**	**10/27/2009**	**10/26/2009**	**10/26/2009**
Dissolved Methane	ug/L	< 10	< 10	106	79.6	201	171	< 10	287	44.4
Total Iron	ug/L	37,800	62,400	47,600	30,000	7,350	8,460	1,200	7,920	171
Total Manganese	ug/L	6,410	5,420	3,820	1,670	3,100	3,110	660	1,710	111
Dissolved Iron	ug/L	**824**	< 50	**8,480**	< 50	**669**	**735**	199	**6,890**	< 50
Dissolved Manganese	ug/L	238	198	**1,440**	233	**2,990**	**3,040**	684	**1,790**	< 5
Temperature	°C	11.04	9.85	10.22	13.69	10.93	10.93	10.29	10.50	8.96
pH		9.24	10.59	9.45	9.29	7.38	NM	NM	8.57	8.93
Specific Conductivity	umhos	0.353	0.375	0.304	0.331	0.410	0.410	0.344	0.417	0.342
Dissolved Oxygen	mg/L	1.17	0.78	3.49	0.23	0.31	0.31	0.12	0.81	0.86
Oxidation Reduction Potential	mV	32.5	57.9	-65.0	-15.0	-56.9	-56.9	-44.8	-87.00	46.5

Note:
< Less Than
pH meter stopped working at wells indicating not measured (NM).
ug/L - micrograms per liter
Values exceeding ROD groundwater cleanup levels in bold type (dissolved iron 300 mg/L, dissolved manganese 778 mg/L)
umhos - micromhos
mg/L - milligrams per liter
mV - millivolts
°C - degrees centigrade

File: B:\CADD\CADD FORT COLLINS\BNSF KRY_Local Coordinate\Methane Investigation\Figure 1-2 Soil Vapor Sampling Results.dwg Layout: ANSI_BVI-LJ User: marshalle Plotted: Mar 29, 2011 - 10:25am Xref's:



LEGEND

NOTES:

1. BASEMAP INFORMATION WAS OBTAINED FROM THE TD&H JUNE 2010 SITE GROUND SURVEY.
2. UTILITY LINES WERE TAKEN FROM A PREVIOUS UTILITY SURVEY MAP, CONVERTED WITH SCALE FACTOR OF 1.000535286 AND ADDED TO THIS GROUND SURVEY BASEMAP.
3. ALL WELLS, BORINGS, TEST PITS LOCATIONS ETC. WERE CONVERTED WITH SCALE FACTOR OF 1.000535286 AND ADDED TO THIS GROUND SURVEY BASEMAP.

VP-1-09 SOIL GAS MONITORING WELL
SS-3-09 SURFACE SOIL LOCATIONS
MONITORING WELL
HISTORIC SURFACE SOIL LOCATION
BUILDING
FENCE
GAS UTILITY LINE
WATER UTILITY LINE
ELECTRIC OVERHEAD UTILITY LINE
ELECTRIC UNDERGROUND UTILITY LINE

ppmv = PARTS PER MILLION BY VOLUME
CONTOUR MINOR
2930 CONTOUR MAJOR
PROPERTY LINE
KRY SITE BOUNDARY
TRAIL
ROAD
RAILROAD

50 0 100
SCALE IN FEET

Modified From:AECOM.2011. KRY Site Sawdust Investigation Report Rev 1, Kalispell, Montana. April 6.

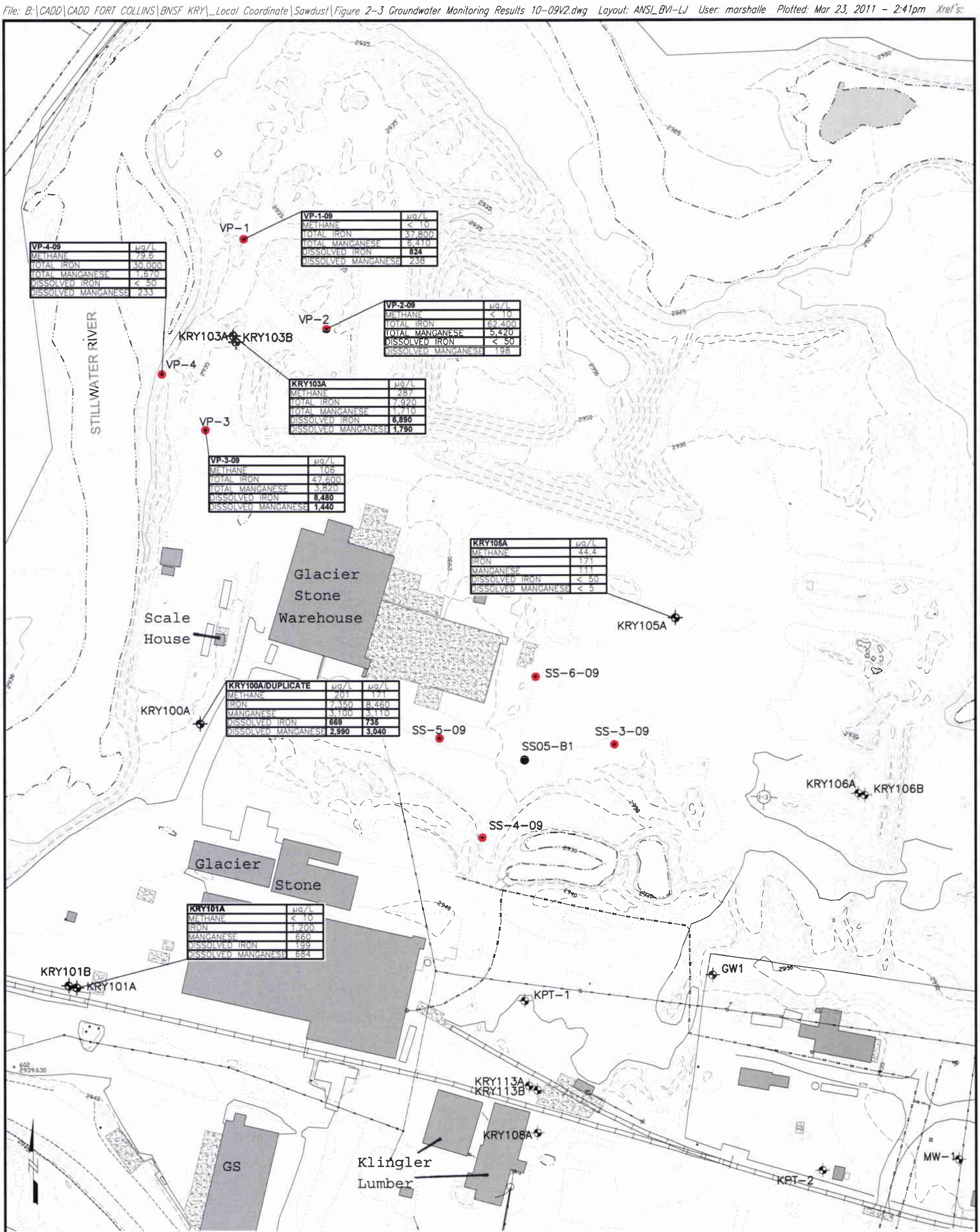
KRY SITE
KALISPELL, MONTANA
(60147138-2.250)

DATE: 3/29/11 DRWN: EM/FTC

SOIL VAPOR
SAMPLING RESULTS

FIGURE 2-1

File: B:\CADD\CADD FORT COLLINS\BNSF KRY_Local Coordinate\Sawdust\Figure 2-3 Groundwater Monitoring Results 10-09V2.dwg Layout: ANSI_BVI-LJ User: marshalle Plotted: Mar 23, 2011 - 2:41pm Xref's:



50 0 100

SCALE IN FEET

NOTES:

1. BASEMAP INFORMATION WAS OBTAINED FROM THE TD&H JUNE 2010 SITE GROUND SURVEY.
2. UTILITY LINES WERE TAKEN FROM A PREVIOUS UTILITY SURVEY MAP, CONVERTED WITH SCALE FACTOR OF 1.000535286 AND ADDED TO THIS GROUND SURVEY BASEMAP.
3. ALL WELLS, BORINGS, TEST PITS LOCATIONS ETC. WERE CONVERTED WITH SCALE FACTOR OF 1.000535286 AND ADDED TO THIS GROUND SURVEY BASEMAP.
4. VALUES EXCEEDING THE ROD GROUNDWATER CLEANUP LEVELS IN BOLD TYPE (DISSOLVED IRON 300 ug/L, DISSOLVED MANGANESE 778 ug/L).

LEGEND

VP-1-09	SOIL GAS MONITORING WELL
SS-3-09	SURFACE SOIL LOCATIONS
	MONITORING WELL
	HISTORIC SURFACE SOIL LOCATION
	BUILDING
	FENCE
GAS	GAS UTILITY LINE
VTR	WATER UTILITY LINE
EOH	ELECTRIC OVERHEAD UTILITY LINE
EUG	ELECTRIC UNDERGROUND UTILITY LINE
µg/L	CONCENTRATIONS IN MICROGRAM PER LITER
	CONTOUR MINOR
2930	CONTOUR MAJOR
	PROPERTY LINE
	KRY SITE BOUNDARY
	TRAIL
	ROAD
	RAILROAD

Modified From:AECOM.2011. KRY Site Sawdust Investigation Report Rev 1, Kalispell, Montana. April 6.

KRY SITE
KALISPELL, MONTANA
(60147138-2.251)

DATE: 3/14/11 | DRWN: EM/FTC

GROUNDWATER MONITORING RESULTS
OCTOBER 2009

FIGURE 2-3

APPENDIX D

Table 2-1 Soil Vapor Data
KRY Site
Kalispell, Montana

Location	Date	Volume Purged (L)	Temperature* (^oF)	% CO_2	% O_2	% CH_4	% Balance Gas	% LEL	Barometric Pressure (inHg)	Sawdust Encountered (ft bgs)	Comments
VP-1-09	10/10/2011	3.9	55	28.4	0.0	14.7	56.9	Limit	26.60	0-7	Pressure constant
VP-2-09	10/10/2011	3.9	55	22.9	0.6	0.5	75.9	10	26.59	0-7	Pressure constant
VP-3-09	10/10/2011	3.9	55	26.9	0.0	21.3	51.8	Limit	26.63	0-7	Pressure constant
VP-4-09	10/10/2011	3.9	55	25.6	0.0	7.6	67.3	Limit	26.61	0-7.5	Pressure constant
VP-1-11	10/11/2011	3.9	50	13.4	0.0	16.3	70.5	Limit	26.71	0-6	Pressure constant
VP-2-11	10/11/2011	3.9	50	30.4	0.0	33.6	36.0	Limit	26.69	0-7	Pressure constant
VP-3-11	10/11/2011	3.9	50	29.8	0.0	24.1	46.5	Limit	26.68	0-5	Pressure constant
VP-4-11	10/11/2011	3.9	50	19.2	0.0	14.0	66.8	Limit	26.68	0-4	Pressure constant
VP-5-11	10/11/2011	3.9	50	28.9	0.0	49.7	21.3	Limit	26.68	0-4	Pressure constant
VP-6-11	10/11/2011	3.9	50	26.4	0.0	37.0	36.6	Limit	26.71	0-5	Pressure constant
VP-7-11	10/11/2011	3.9	50	19.3	0.0	29.7	50.9	Limit	26.69	0-7	Pressure constant
VP-8-11	10/11/2011	3.9	50	16.3	0.0	2.9	80.8	58	26.78	0-5.5	Pressure constant
VP-9-11	10/11/2011	3.9	50	21.1	6.2	23.4	49.7	Limit	26.71	2.5-4	Pressure constant
VP-10-11	10/11/2011	3.9	50	21.7	5.0	24.6	48.8	Limit	26.75	0-4	Pressure constant
VP-11-11	10/12/2011	3.9	44	34.8	0.0	40.8	24.4	Limit	27.06	1-4	Pressure constant
VP-12-11	10/12/2011	3.9	43	6.6	9.9	0.0	83.5	1	27.09	0-0.5	Pressure constant
VP-13-11	10/12/2011	3.9	51	25.1	0.0	3.6	71.4	73	27.09	0-6	Pressure constant
VP-14-11	10/12/2011	3.9	48	32.5	0.0	25.8	41.7	Limit	27.07	0-4	Pressure constant
VP-15-11	10/12/2011	3.9	48	4.9	18.0	0.6	76.4	13	27.07	0-5	Pressure constant
VP-16-11	10/12/2011	3.9	51	0.9	19.8	0.0	79.3	0	27.06	none	Pressure constant
VP-17-11	10/12/2011	3.9	51	11.7	9.8	0.0	78.5	0	27.05	0-0.5	Pressure constant

Note:

% CH_4 = percent methane by volume

% CO_2 = percent carbon dioxide by volume

^oF = degrees Fahrenheit

inHg = inches mercury

L = liter

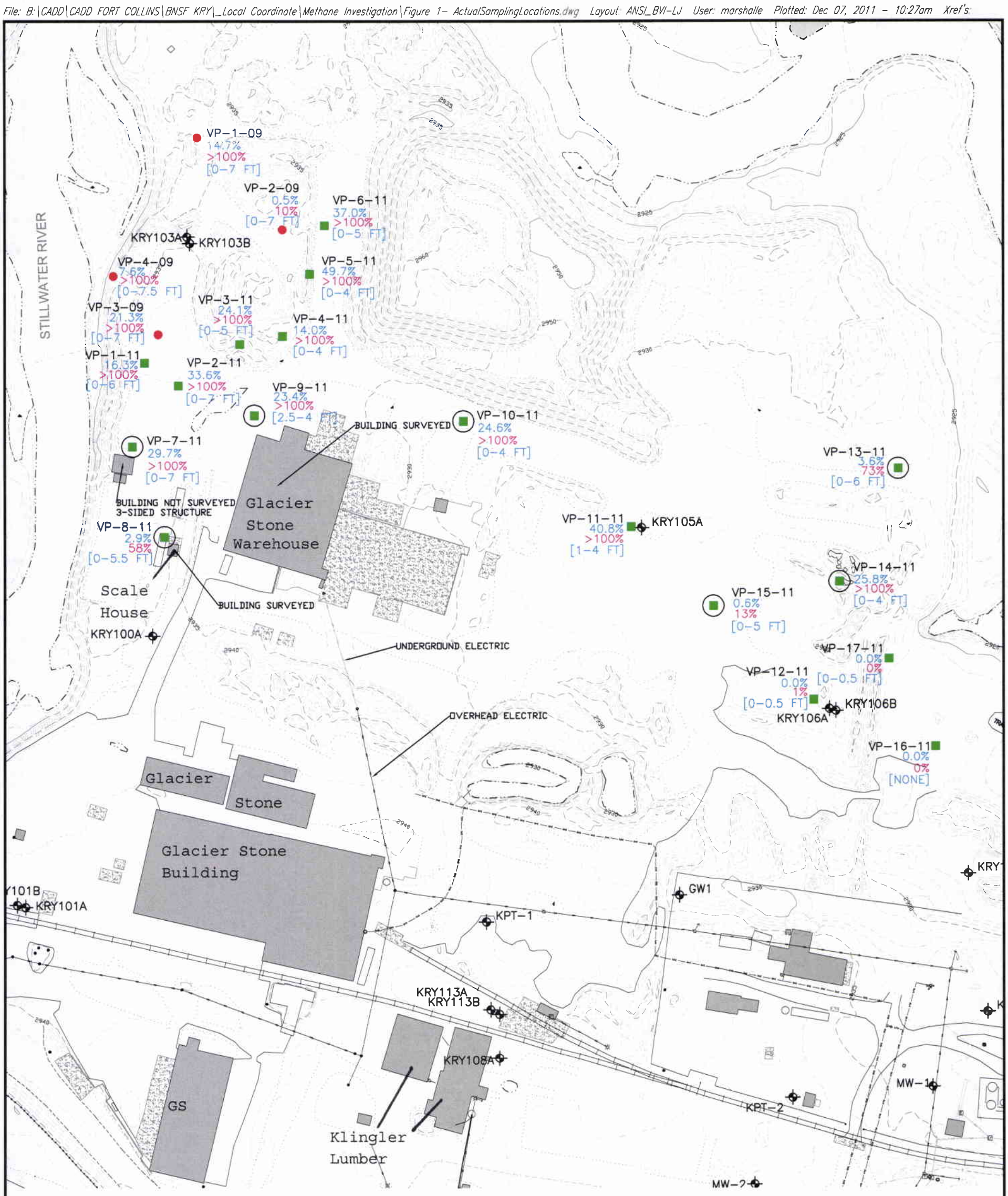
% LEL = percent lower explosive limit of methane

Limit = above instrument LEL range

% O_2 = percent oxygen by volume

* = data from 10/10/11 to 10/11/11 is approximate ambient air temperature. Data from 10/12/11 is soil temperature data.

File: B:\CADD\CADD FORT COLLINS\BNSF KRY_Local Coordinate\Methane Investigation\Figure 1- ActualSamplingLocations.dwg Layout: ANSI_BVI-LJ User: marshalle Plotted: Dec 07, 2011 - 10:27am Xref's:



LEGEND

VP-15-11 ■	TEMPORARY SOIL VAPOR POINT
VP-15-11 ◉	SEMI-PERMANENT SOIL VAPOR POINT CONVERTED TO PERMANENT SOIL VAPOR POINT
VP-1-09 ●	EXISTING SOIL VAPOR MONITORING WELL
3.6%	PERCENT METHANE BY VOLUME
73%	PERCENT LOWER EXPLOSIVE LIMIT (LEL) OF METHANE (>100% = ABOVE INSTRUMENT LEL RANGE)
[0-5-FT]	DEPTH RANGE OF OBSERVED SAWDUST
⊕	MONITORING WELL
▭	BUILDING
— • — • —	FENCE
—— GAS —— GAS ——	GAS UTILITY LINE
—— WTR —— WTR ——	WATER UTILITY LINE
—— EOH ——	ELECTRIC OVERHEAD UTILITY LINE
—— EUG ——	ELECTRIC UNDERGROUND UTILITY LINE
·····	CONTOUR MINOR
2930 - - - - - -	CONTOUR MAJOR
— — — —	PROPERTY LINE
—·—·—·—	KRY SITE BOUNDARY
·····	TRAIL
▭	ROAD
═══	RAILROAD

N

50 0 100
SCALE IN FEET

NOTES:

1. BASEMAP INFORMATION WAS OBTAINED FROM THE TD&H JUNE 2010 SITE GROUND SURVEY.
2. UTILITY LINES WERE TAKEN FROM A PREVIOUS UTILITY SURVEY MAP, CONVERTED WITH SCALE FACTOR OF 1.000535286 AND ADDED TO THIS GROUND SURVEY BASEMAP.
3. ALL WELLS, BORINGS, TEST PITS LOCATIONS ETC. WERE CONVERTED WITH SCALE FACTOR OF 1.000535286 AND ADDED TO THIS GROUND SURVEY BASEMAP.
4. COORDINATES FOR SOIL VAPOR POINTS INSTALLED IN 2011 WERE COLLECTED BY FIELD STAFF USING A HANDHELD GPS.

Modified From: AECOM.2011b. KRY Site Methane Investigation Report, Kalispell, Montana. December.

KRY SITE
KALISPELL, MONTANA
(60214452.215)

DATE: 10/27/11 | DRWN: EM/FTC

SOIL VAPOR POINTS

FIGURE 2-1

APPENDIX E

Table 7 October 2011 Metals Analytical Results, BNSF KRY Site - Kalispell, Montana

		Chemical	Iron	Dissolved Iron	Manganese	Dissolved Manganese
		Unit	ug/l	ug/l	ug/l	ug/l
		ROD Cleanup Level	300		778	
Well ID	**Sample Type**	**Sample Date**				
KPT-9		10/22/2011	< 50.0	< 50.0	**2,350**	205
KPT-15		10/24/2011	149	< 50.0	5.9	< 5.0
KRY-100A		10/26/2011	**4,420**	< 50.0	**912**	1,020
KRY-101A		10/21/2011	**337 J**	< 50.0	574	567
KRY-101C	Duplicate at KRY-101A	10/21/2011	**1,550 J**	< 50.0	603	555
KRY-103A		10/26/2011	**9,990**	< 50.0	**1,350**	1,320
KRY-123A		10/25/2011	**430**	< 50.0	31.0	< 5.0
KRY-126A		10/25/2011	**7,480**	< 50.0	197	< 5.0
ERB1021	RB	10/21/2011	< 50.0	< 50.0	< 5.0	< 5.0
ERB1022	RB	10/22/2011	< 50.0	< 50.0	< 5.0	< 5.0
ERB1024	RB	10/24/2011	< 50.0	< 50.0	< 5.0	< 5.0
ERB1025	RB	10/25/2011	< 50.0	< 50.0	< 5.0	< 5.0
ERB1026	RB	10/26/2011	< 50.0	< 50.0	< 5.0	< 5.0

Notes:

J = estimated concentration

Bold = indicates concentration above the ROD clean-up level (iron clean-up level is 300 ug/L and manganese clean-up level is 778 ug/L)

µg/L = micrograms per liter

RB = equipment rinse blank

AECOM.2012b. October 2011 Groundwater Monitoring Report KRY Site- Kalispell, Montana. January.

APPENDIX F

Table 1
Summary of Correlation Study Analytical Results

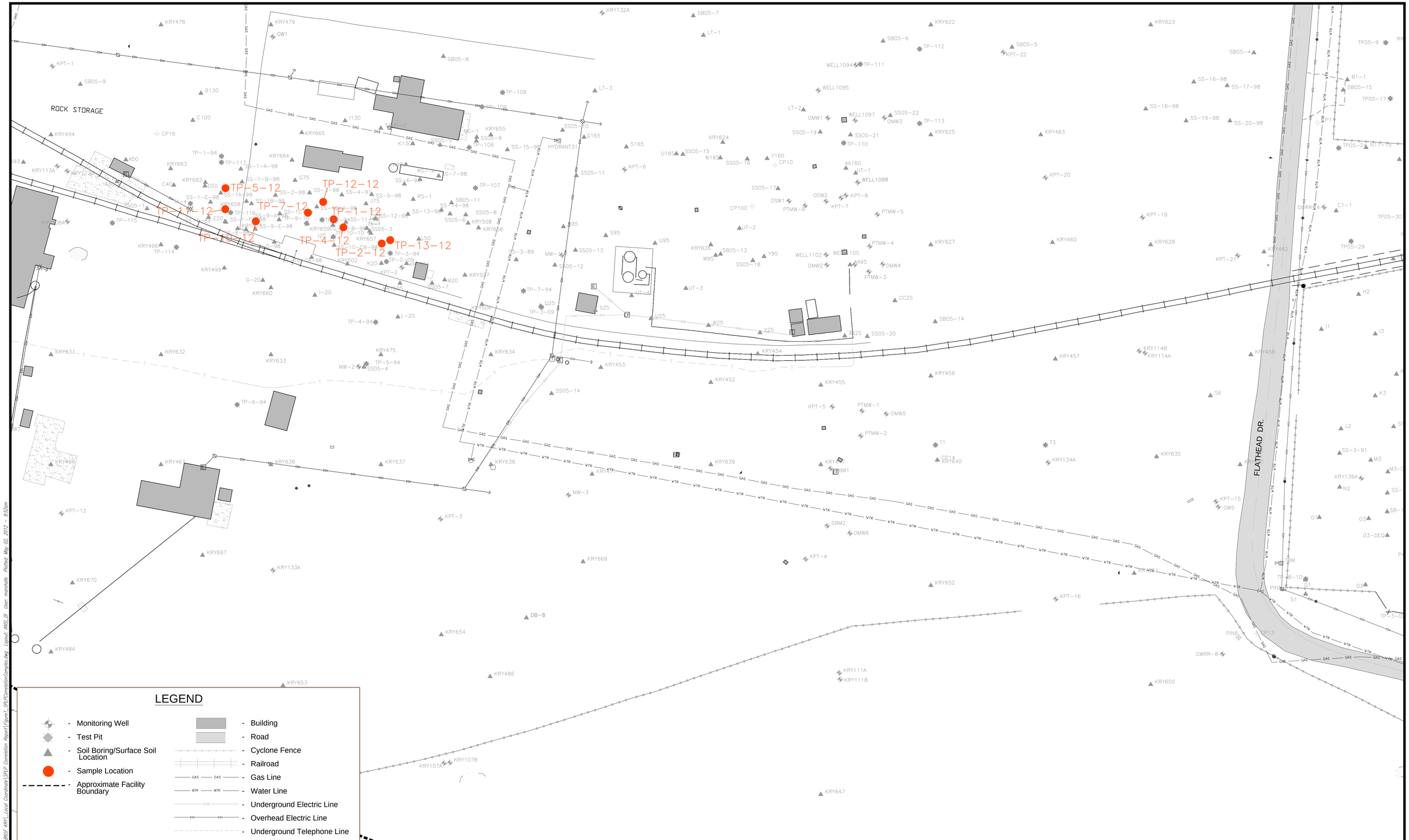
				analytic_method	EPA 1653M	EPA 8270D SIM	EPA 8270D SIM, SPLP	EPA 8270D SIM, TCLP	EPA 9045D	EPA 9081	Lloyd Kahn 7-27-1988	SM2320B	EPA 160.3	EPA 9040C	ASTM D 422
				chemical_name	Pentachlorophenol	Pentachlorophenol	Pentachlorophenol	Pentachlorophenol	pH	Cation Exchange Capacity	Total Organic Carbon	Alkalinity, total	Total Solids	post SPLP pH	grain size <#200
				cas_rn	87-86-5	87-86-5	87-86-5	87-86-5	pH	CEC	TOC	ALKT	TS	pH	
Sample_Name	Sys_Loc_Code	Start_Depth	End_Depth	Matrix_Code	mg/kg	ug/kg	ug/L	ug/L		meq/100g	%	mg/kg	%		% finer
Dup-1-041012	TP-2-12	5	6	SO		< 200	< 1.1		8.93	8.71	0.142	2400	94.3	5.47	6.8
Dup-2-04-1012 (4-5)	TP-10-12	4	5	SO		90000	240		8.21	7.56	0.519	3290	90.9	5.11	15.6
Dup-3-041112	TP-1-12	6	7	SO		< 200	< 1.1		8.51	8.34	0.087	1570	92.4	4.87	11.7
TP-10-12 (4-5)	TP-10-12	4	5	SO		100000	370		8.05	10.04	0.493	3520	90.6	5.26	15.6
TP-11-12 (3-4)	TP-11-12	3	4	SO		9700	17		8.24	7.61	0.254	7130	92.3	5.63	15.5
TP-11-12 (4-5)	TP-11-12	4	5	SO		1500	13		8.4	9.37	< 0.050	3780	93.8	5.33	7.8
TP-1-12 (6-7)	TP-1-12	6	7	SO		< 200	< 1.1		8.19	8.32	0.123	1860	92.6	4.86	11.7
TP-1-12 (6-7) A	TP-1-12	6	7	SO	< 0.50	#N/A	#N/A		#N/A	#N/A	#N/A	#N/A	92.1	#N/A	11.7
TP-1-12 (9-10)	TP-1-12	9	10	SO		240	2		8.33	11.1	0.065	12100	90.6	5.71	20.9
TP-1-12R (6-7)	TP-1-12R	6	7	SO		< 190	1.5		8.34	7.72	0.179	930	92.4	4.75	12.3
TP-1-12R (9-10)	TP-1-12R	9	10	SO		< 190	1.5		8.43	10.58	0.103	10600	90.8	5.76	22.4
TP-12-12 (6-8)	TP-12-12	6	8	SO		< 200	< 1.1		8.1	15.23	< 0.050	17700	84.4	5.93	56.2
TP-12-12 (6-8) A	TP-12-12	6	8	SO	< 0.50	#N/A	#N/A		#N/A	#N/A	#N/A	#N/A	83.4	#N/A	56.2
TP-12-12 (6-8) Proper	TP-12-12	6	8	SO		< 190	< 1.1		#N/A	#N/A	#N/A	#N/A	85.6	5.96	56.2
TP-12-12 (6-8) TCLP	TP-12-12	6	8	SO		#N/A	#N/A	< 1.1	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	56.2
TP-12-12 (9-10)	TP-12-12	9	10	SO		240000	2900		7.69	15.48	0.231	6190	92.1	5.8	32.4
TP-13-12 (3-4)	TP-13-12	3	4	SO		7000	6.5		8.41	8.37	0.185	18000	93.1	5.65	20.3
TP-13-12 (5-6)	TP-13-12	5	6	SO		7000	9.7		8.64	7.67	0.232	9530	92.2	5.44	15.3
TP-13-12 (7-8)	TP-13-12	7	8	SO		< 200	< 1.1		8.51	11.52	< 0.050	942	92.1	4.57	9.3
TP-13-12 R (3-4)	TP-13-12R	3	4	SO		12000	28		8.52	12.37	0.309	13400	91.8	5.59	20.4
TP-13-12R (5-6)	TP-13-12R	5	6	SO		4500	7.4		8.5	9.73	0.134	7230	93.4	5.5	16.3
TP-2-12 (3-4)	TP-2-12	3	4	SO		12000	12		8.41	11.26	0.368	10800	89.8	5.65	#N/A
TP-2-12 (5-6)	TP-2-12	5	6	SO		< 200	< 1.3		8.71	7.88	< 0.050 UJ	2990	94.4	5.36	18.7
TP-2-12R (3-4)	TP-2-12R	3	4	SO		32000	36		8.23	11.88	0.774	11300	89.3	5.53	6.8
TP-4-12 (7-8)	TP-4-12	7	8	SO		4000	4.1		7.95	8.66	0.631	1820	93.5	5.11	28.5
TP-4-12 (9-10)	TP-4-12	9	10	SO		12000	12		8.41	8.4	0.237	2360	93.6	5.12	8.2
TP-4-12R (7-8)	TP-4-12R	7	8	SO		3500	3.4		8.2	6.7	0.59	1280	93.3	5.05	9.3
TP-4-12R (9-10)	TP-4-12R	9	10	SO		17000	27		8.24	9.04	0.35	2360	93.5	5.11	9.4
TP-5-12 (5-6)	TP-5-12	5	6	SO		53000	430		8.07	6.96	0.225	2500	94.3	5.29	7.8
TP-5-12 (5-6) TCLP	TP-5-12	5	6	SO		#N/A	#N/A	790	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	10.4
TP-5-12 (7-8)	TP-5-12	7	8	SO		49000	86		8.07	8.11	0.337	3920	88.5	5.25	15.5
TP-5-12R (7-8)	TP-5-12R	7	8	SO		89000	110		8.05	8.3	0.463	4170	90.9	5.13	13.8
TP-7-12 (8-9.5) Proper	TP-7-12	8	9.5	SO		< 190	1.7		#N/A	#N/A	#N/A	#N/A	84.1	5.94	55.5
TP-7-12- (10-12)	TP-7-12	10	12	SO		52000	1100		8.19	9.28	0.118	4180	94.1	5.09	13.5
TP-7-12- (4-5.5)	TP-7-12	4	5.5	SO		19000	64		8.14	9.17	0.182	4590	94.9	5.73	11.5
TP-7-12 (4-5.5) A	TP-7-12	4	5.5	SO	4.5	#N/A	#N/A		#N/A	#N/A	#N/A	#N/A	94.2	#N/A	11.5
TP-7-12 (4-5.5) TCLP	TP-7-12	4	5.5	SO		#N/A	#N/A	23	#N/A	#N/A	#N/A	#N/A		#N/A	11.5
TP-7-12- (8-9.5)	TP-7-12	8	9.5	SO		< 200	1.2		7.83	15.7	< 0.050	39500	82.2	5.27	55.5
TP-7-12R (8-9.5)	TP-7-12R	8	9.5	SO		< 200	1.2		7.86	9.82	< 0.050	61200	78.9	5.36	85.3
TP-7-12R (10-12)	TP-7-12R	10	12	SO		49000	1200		8.22	8.93	0.102	3030	94.2	5.2	12.1
TP-7-12R- (4-5.5)	TP-7-12R	4	5.5	SO		19000	68		7.88	14.03	0.185	6200	94.5	5.69	11

AECOM. 2012. Memorandum. Results of KRY Site Sample Collection for Total PCP.SPLP PCP Correlation, Revision 1. July.

Table 2
Summary of Dual Detection Correlation Study Results

8270D SIM	8270D SIM, SPLP	NA	9045D	9081	LKahn 7-27-1988	SM2320B	9045	ASTM D 422
Pentachlorophenol	Pentachlorophenol	% leaching	pH	Cation Exchange Capacity	Total Organic Carbon	Alkalinity, total	post SPLP pH	% < #200
87-86-5	87-86-5	NA	pH	CEC	TOC	ALKT	pH	NA
ug/kg	ug/L	%						
240000	2900	24.17	7.69	15.48	0.231	6190	5.96	32.4
100000	370	7.40	8.51	8.34	0.087	1570	4.87	15.6
90000	240	5.33	8.21	7.56	0.519	3290	5.11	#N/A
89000	110	2.47	8.05	8.3	0.463	4170	5.13	13.8
53000	430	16.23	8.07	6.96	0.225	2500	5.29	10.4
52000	1100	42.31	8.19	9.28	0.118	4180	5.09	13.5
49000	86	3.51	8.07	8.11	0.337	3920	5.25	15.5
49000	1200	48.98	8.22	8.93	0.102	3030	5.2	12.1
32000	36	2.25	8.23	11.88	0.774	11300	5.53	28.5
19000	64	6.74	8.14	9.17	0.182	4590	5.73	11.5
19000	68	7.16	7.88	14.03	0.185	6200	5.69	11
17000	27	3.18	8.24	9.04	0.35	2360	5.11	7.8
12000	12	2.00	8.41	11.26	0.368	10800	5.65	18.7
12000	12	2.00	8.41	8.4	0.237	2360	5.12	9.3
12000	28	4.67	8.52	12.37	0.309	13400	4.57	20.4
9700	17	3.51	8.24	7.61	0.254	7130	5.63	15.5
7000	6.5	1.86	8.41	8.37	0.185	18000	5.8	20.3
7000	9.7	2.77	8.64	7.67	0.232	9530	5.65	15.3
4500	7.4	3.29	8.5	9.73	0.134	7230	5.59	16.3
4000	4.1	2.05	7.95	8.66	0.631	1820	5.11	8.2
3500	3.4	1.94	8.2	6.7	0.59	1280	5.05	9.4
1500	13	17.33	8.05	10.04	0.493	3520	5.26	7.8
240	2	16.67	8.19	8.32	0.123	1860	4.86	20.9

AECOM.2012. Memorandum. Results of KRY Site Sample Collection for Total PCP/SPLP PCP Correlation, Revision 1. July.



AECOM

SPLP CORRELATION REPORT
KRY SITE
KALISPELL, MONTANA (60249727)

DATE: 4/23/12 | DRWN: EM/FTC

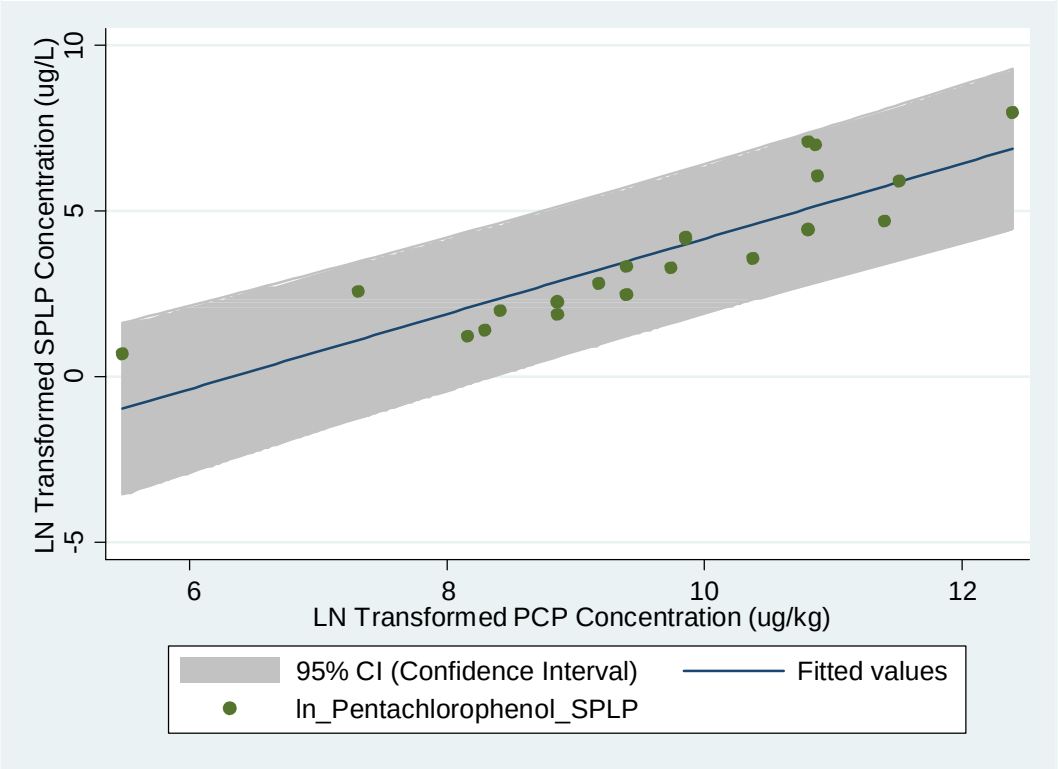
TOTAL PCP/SPLP PCP CORRELATION SAMPLE LOCATIONS

FIGURE 1

File: G:\CADD\CADD CONT COLLINS\60PCP KRY1_Local Coordinate\SPLP Correlation Report\Figure1_SPLPCorrelationSamples.dwg Layout: ANSI_B User: marshalle Plotted: May 02, 2012 - 8:52am

AECOM.2012. Memorandum. Results of KRY Site Sample Collection for Total PCP/SPLP PCP Correlation, Revision 1. July.

Figure 3 Linear Fit Regression Plot of Natural Log of Total PCP (x) vs Natural Log of SPLP PCP (y) for Dual Detect Dataset Results (showing 95% CI limits based on fit of data points to regression line in gray)



Modified from: AECOM.2012. Memorandum. Results of KRY Site Sample Collection for Total PCP/SPLP PCP Correlation, Revision 1. July.

APPENDIX G

CONSTRUCTION/EXCAVATION WORKER SCENARIO
NON-CARCINOGENS
March 2013

Non-cancer Risk-Based Concentration (without volatilization factor with inhalation):

Cs-ing = [(THQo*AT*BWa)/(EF*ED*(1/RfDo)*RAFo*IRSa*CF)]

Cs-derm = [(THQo*AT*BWa)/(EF*ED*(1/(RfDo*GIABS))*SAa*AFa*ABSd*CF)]

Cs-inh = [(THQi*AT)/(EF*ED*ETcom*(1/RfC)*(1/PEF))]

Cs-total = [1/((1/Cs-ing)+(1/Cs-derm)+(1/Cs-inh))]

DIOXIN	
Parameters	Values
Cs-total (Soil concentration - mg/kg)	4.7E-04
Cs-ing (Soil concentration - mg/kg)	5.0E-04
Cs-derm (Soil concentration - mg/kg)	7.5E-03
Cs-inh (Soil concentration - mg/kg)	4.9E+02
THQo (Oral target hazard quotient)	1
AT (Averaging time - day; EPA, December 1989)	365
BWa (Adult body weight - kg; EPA, October 2011)	80
EF (Exposure frequency - day/yr; DEQ, 2008)	124
ED (Exposure duration - yr; EPA, December 1989)	1
RfDo (Chemical specific oral reference dose - mg/kg-day; IRIS, February 2012, verfied March 2013)	7.0E-10
RAFo (Chemical specific oral relative absorption factor - unitless; EPA, November 2012)	1
IRSa (Adult soil ingestion rate - mg soil/day; EPA, December 2002)	330
CF (Conversion factor - kg/mg; EPA, December 1991)	1.0E-06
GIABS (Chemical-specific GI absorption adjustment for dermal exposure - unitless; EPA, Nov. 2012)	1
SAa (Adult surface area - cm^2/day; EPA, October 2011)	3500
AFa (Adult adherence factor - mg/cm^2; EPA, October 2011)	0.21
ABSd (Chemical specific dermal relative absorption factor - unitless; EPA, November 2012)	0.03
THQi (Inhalation target hazard quotient)	1
ETcom (Commercial exposure time - 8 hr/day*1 day/24 hr; EPA, November 2012)	0.33
RfC (Chemical specific inhalation reference concentration - mg/m^3; EPA, November 2012)	4.0E-08
PEF (Particulate emission factor - m^3/kg; EPA, November 2012)	1.4E+09

APPENDIX H

BNSF KRY, Kalispell, MT
Cost Estimate for excavation/capping due to proposed D/F exceedance
REV: April 2, 2013

Additional Excavation 34C - Option #1

Assumptions:

1) LTU will be completely removed at the end of its useful life (after all impacted materials within the LTU have been treated and removed). Costs for LTU removal not included.
2) Excavate two sample locations (P17CD-E-SS-071912-34C and P18CDB-E-SS-071912-34C) to a depth of 10 feet, a width of 20 feet, and a length of 40 feet. The combined excavation would be 60' x 40' x 10' deep.
3) Two step-outs required with confirmation samples at each of the two locations. Assumes each step-out is 20 feet, first confirmation sample fails, second confirmation sample passes.
4) Excavated soil to be placed in repository.
5) Backfill completed excavation with clean imported material.
6) Additional mob/demob not required since work will occur during LTU decommissioning.
7) Additional restoration not required since area will be restored at part of LTU decommissioning.
8) Unit costs from Envirocon Bid for KRY dated April 2012.

Bid Item #	Description	Unit	Quantity	Unit Cost	Total Cost	Notes
16	Excavate and Stockpile	CY	1825	$ 4.15	$ 7,573.38	10 feet deep, 2:1 side slopes, 40' x 60' bottom of excavation, 80' x 100' top of excavation
27	Placement of Soil in the Dioxins/Furans Repository	CY	1825	$ 9.00	$ 16,424.20	
	Confirmation Sampling (Analytical)	Each	4	$ 700.00	$ 2,800.00	1 per 50' length of sidewall. Assume D/F analyzed on an expedited turn-around.
	AECOM data management and analysis	LS	1	$ 3,000.00	$ 3,000.00	Review, DV, loading to DB, Figure and Table generation, submittal to MDEQ
35	Import and Placement of Clean Backfill	Ton	2737	$ 7.80	$ 21,351.46	
					$ 51,149.04	**TOTAL**

Expanded Repository Cover over 34C - Option #2

Assumptions:

1) LTU will be completely removed at the end of its useful life (after all impacted materials within the LTU have been treated and removed). Costs for LTU removal not included.
2) Two step-out confirmation samples at each of two locations (P17CD-E-SS-071912-34C and P18CDB-E-SS-071912-34C). Assumes each step-out is 10 feet deep and 20 feet east of previous sample location. Each confirmation sample will consist of a 5-point composite from 5 borings. Assumes first confirmation sample fails, second confirmation sample passes.
3) Repository cap is extended to cover an area of approximately 50 by 50 feet.
4) Additional mob/demob not required since work will occur during LTU decommissioning.
5) Additional restoration not required since area will be restored at part of LTU decommissioning.
6) Unit costs from Envirocon Bid for KRY dated April 2012.

Bid Item #	Description	Unit	Quantity	Unit Cost	Total Cost	Notes
	Borings	LS	1	$ 7,200.00	$ 7,200.00	Includes mobilization, materials, labor for subcontractor (based on JBR quote for BNSF Paradise in November 2012)
	Confirmation Sampling (Analytical)	Each	4	700	$ 2,800.00	1 per each 5 borings. Assume D/F analyzed on an expedited turn-around.
	AECOM data management and analysis	LS	1	$ 3,000.00	$ 3,000.00	Review, DV, loading to DB, Figure and Table generation, submittal to MDEQ
16	Excavate and Stockpile	CY	185	$ 4.15	$ 768.52	50' x 50' x 2' deep cap
28	Dioxins/Furans Repository Phase I Final Cap Construction	SF	2500	$ 1.50	$ 3,750.00	50' x 50'. Includes import and placement of cap material.
					$ 17,518.52	**TOTAL**

BNSF Railway Company (BNSF). 2013. Email regarding revised dioxins/furans subsurface soil cleanup level at the KRY Site. From Mark Engdahl (BNSF) to Moriah Bucy (DEQ). April 17.

AECOM

BNSF Railway Company(BNSF). 2013. Email regarding revised dioxins/furans subsurface soil cleanup level at the KRY Site. From Mark Engdahl(BNSF) to Moriah Bucy(DEQ). April 17.

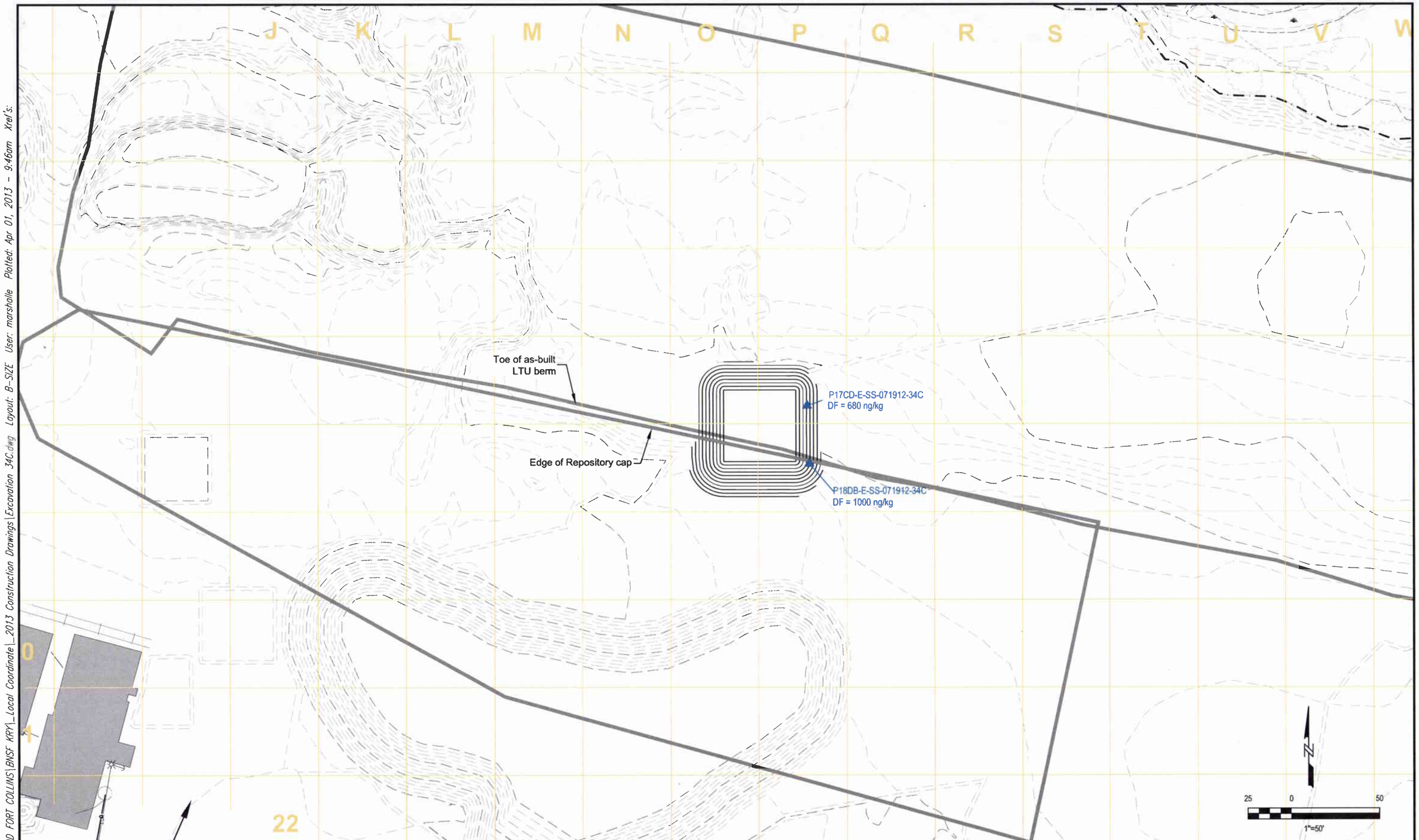
BNSF RAILWAY COMPANY
KRY SITE
KALISPELL, MONTANA

DATE: 8/13/12 | DRWN: EM/FTC

SOIL SAMPLING LOCATIONS
EVENT 34C

FIGURE 1

File: B:\CADD\CADD FORT COLLINS\BNSF KRY_Local Coordinate\1_2012 Implementation Drawings\Sample Location Drawings\Event 34C\Event 34C.dwg Layout: B-SIZE User: marshalle Plotted: Aug 15, 2012 - 7:13am



Modified From: BNSF Railway company(BNSF). 2013. Email regarding revised dioxins/furans subsurface soil cleanup level at the KRY Site. From Mark Engdahl(BNSF) to Moriah Bucy(DEQ). April 17.

ng/kg= nanograms per kilogram

BNSF RAILWAY COMPANY
KRY SITE
KALISPELL, MONTANA

DATE: 3/28/13 | DRWN: EM/FTC

Locations Exceeding Dioxin/ Furan SSCL (Event 34C)

FIGURE 2

File: B:\CADD\CADD FORT COLLINS\BNSF KRY_Local Coordinate_2013 Construction Drawings\Excavation 34C.dwg Layout: B-SIZE User: marshalle Plotted: Apr 01, 2013 - 9:46am Xref's: