**February 27, 2017**



# PHASE I SITE CHARACTERIZATION DATA SUMMARY REPORT

## Columbia Falls Aluminum Company
## Columbia Falls, Flathead County, Montana

***Prepared for***

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## TABLE OF CONTENTS

**TABLES**

**APPENDICES (Continued)**

6. General Chemistry in Soil Samples from Site-wide Soil Boring and Monitoring Well Locations
7. Dioxins and Furans in Soil Samples from Soil Boring and Monitoring Well Locations
8. SVOCs in Incremental Soil Samples
9. Metals in Incremental Soil Samples
10. PCBs in Incremental Soil Samples
11. Pesticides in Incremental Soil Samples
12. General Chemistry in Incremental Soil Samples
13. VOCs in Soil Samples from Drainage Structure Sampling Locations
14. SVOCs in Soil Samples from Drainage Structure Sampling Locations
15. Metals in Soil Samples from Drainage Structure Sampling Locations
16. PCBs in Soil Samples from Drainage Structure Sampling Locations
17. Pesticides in Soil Samples from Drainage Structure Sampling Locations
18. General Chemistry in Soil Samples from Drainage Structure Sampling Locations
19. VOCs in Soil Samples from Background Area Samplings Locations
20. SVOCs in Soil Samples from Background Area Samplings Locations
21. Metals in Soil Samples from Background Area Samplings Locations
22. PCBs in Soil Samples from Background Area Samplings Locations
23. Pesticides in Soil Samples from Background Area Samplings Locations
24. General Chemistry in Soil Samples from Background Area Samplings Locations
25. VOCs in Soil Samples from Borrow Pit Sampling Locations
26. SVOCs in Soil Samples from Borrow Pit Sampling Locations
27. Metals in Soil Samples from Borrow Pit Sampling Locations
28. PCBs in Soil Samples from Borrow Pit Sampling Locations
29. Pesticides in Soil Samples from Borrow Pit Sampling Locations
30. General Chemistry Soil Samples from Borrow Pit Sampling Locations

M. Calculation of Relative Percent Difference (RPD) in Resampled Operational Area Soil Samples
1. SVOC RPD Calculation
2. Metals RPD Calculation
3. PCB RPD Calculation
4. Pesticides RPD Calculation
5. General Chemistry RPD Calculation
6. SVOC RPD Adjusted Value
7. Metals RPD Adjusted Value
8. PCB RPD Adjusted Value
9. Pesticides RPD Adjusted Value
10. General Chemistry RPD Adjusted Value

N. Soil Thematic Maps
1. Concentrations of Cyanide and Fluoride in Soil
2. Concentrations of Selected PAHs in Surface Soil
3. Concentrations of Selected PAHs in Shallow Soil
4. Concentrations of Selected PAHs in Intermediate Depth Soil
5. Concentrations of Selected Metals in Surface Soil
6. Concentrations of Selected Metals in Shallow Soil
7. Concentrations of Selected Metals in Intermediate Depth Soil

**APPENDICES (Continued)**

8. Concentrations of Cyanide and Fluoride in Incremental Soil Samples from Operational Grid Area
9. Concentrations of Selected PAHs in Incremental Surface Soil Samples from Operational Grid Area
10. Concentrations of Selected PAHs in Incremental Shallow Soil Samples from Operational Grid Area
11. Concentrations of Selected Metals in Incremental Surface Soil Samples from Operational Grid Area
12. Concentrations of Selected Metals in Incremental Shallow Soil Samples from Operational Grid Area

O. ProUCL Outputs for Lead Sieved Vs Bulk Concentration Comparisons
P. ProUCL Outputs for Background Threshold Values
Q. ProUCL Background Threshold Values Summary Table
R. Background Soil Maps

1. Comparison of Aluminum Concentrations in Surface Soil to Background Statistics
2. Comparison of Arsenic Concentrations in Surface Soil to Background Statistics
3. Comparison of Barium Concentrations in Surface Soil to Background Statistics
4. Comparison of Beryllium Concentrations in Surface Soil to Background Statistics
5. Comparison of Calcium Concentrations in Surface Soil to Background Statistics
6. Comparison of Chromium Concentrations in Surface Soil to Background Statistics
7. Comparison of Cobalt Concentrations in Surface Soil to Background Statistics
8. Comparison of Copper Concentrations in Surface Soil to Background Statistics
9. Comparison of Iron Concentrations in Surface Soil to Background Statistics
10. Comparison of Lead Concentrations in Surface Soil to Background Statistics
11. Comparison of Magnesium Concentrations in Surface Soil to Background Statistics
12. Comparison of Manganese Concentrations in Surface Soil to Background Statistics
13. Comparison of Mercury Concentrations in Surface Soil to Background Statistics
14. Comparison of Nickel Concentrations in Surface Soil to Background Statistics
15. Comparison of Potassium Concentrations in Surface Soil to Background Statistics
16. Comparison of Selenium Concentrations in Surface Soil to Background Statistics
17. Comparison of Sodium Concentrations in Surface Soil to Background Statistics
18. Comparison of Vanadium Concentrations in Surface Soil to Background Statistics
19. Comparison of Zinc Concentrations in Surface Soil to Background Statistics
20. Comparison of Aluminum Concentrations in Shallow Soil to Background Statistics
21. Comparison of Arsenic Concentrations in Shallow Soil to Background Statistics
22. Comparison of Barium Concentrations in Shallow Soil to Background Statistics
23. Comparison of Beryllium Concentrations in Shallow Soil to Background Statistics
24. Comparison of Calcium Concentrations in Shallow Soil to Background Statistics
25. Comparison of Chromium Concentrations in Shallow Soil to Background Statistics
26. Comparison of Cobalt Concentrations in Shallow Soil to Background Statistics
27. Comparison of Copper Concentrations in Shallow Soil to Background Statistics
28. Comparison of Iron Concentrations in Shallow Soil to Background Statistics
29. Comparison of Lead Concentrations in Shallow Soil to Background Statistics
30. Comparison of Magnesium Concentrations in Shallow Soil to Background Statistics
31. Comparison of Manganese Concentrations in Shallow Soil to Background Statistics

**APPENDICES (Continued)**

**APPENDICES (Continued)**

6. Concentrations of Copper in Groundwater from Monitoring Wells Screened in Upper Hydrogeologic Unit
7. Concentrations of Iron in Groundwater from Monitoring Wells Screened in Upper Hydrogeologic Unit
8. Concentrations of Lead in Groundwater from Monitoring Wells Screened in Upper Hydrogeologic Unit
9. Concentrations of Manganese in Groundwater from Monitoring Wells Screened in Upper Hydrogeologic Unit
10. Concentrations of Thallium in Groundwater from Monitoring Wells Screened in Upper Hydrogeologic Unit
11. Concentrations of Ammonia in Groundwater from Monitoring Wells Screened in Upper Hydrogeologic Unit
12. Concentrations of Chloride in Groundwater from Monitoring Wells Screened in Upper Hydrogeologic Unit
13. Concentrations of Calcium Carbonate in Groundwater from Monitoring Wells Screened in Upper Hydrogeologic Unit
14. Concentrations of Nitrate in Groundwater from Monitoring Wells Screened in Upper Hydrogeologic Unit
15. Concentrations of Orthophosphate in Groundwater from Monitoring Wells Screened in Upper Hydrogeologic Unit
16. Concentrations of Sulfate in Groundwater from Monitoring Wells Screened in Upper Hydrogeologic Unit
17. Concentrations of Cyanide in Groundwater from Monitoring Wells Screened Below Upper Hydrogeologic Unit
18. Concentrations of Fluoride in Groundwater from Monitoring Wells Screened Below Upper Hydrogeologic Unit
19. Concentrations of Aluminum in Groundwater from Monitoring Wells Screened Below Upper Hydrogeologic Unit
20. Concentrations of Arsenic in Groundwater from Monitoring Wells Screened Below Upper Hydrogeologic Unit
21. Concentrations of Cobalt in Groundwater from Monitoring Wells Screened Below Upper Hydrogeologic Unit
22. Concentrations of Copper in Groundwater from Monitoring Wells Screened Below Upper Hydrogeologic Unit
23. Concentrations of Iron in Groundwater from Monitoring Wells Screened Below Upper Hydrogeologic Unit
24. Concentrations of Lead in Groundwater from Monitoring Wells Screened Below Upper Hydrogeologic Unit
25. Concentrations of Manganese in Groundwater from Monitoring Wells Screened Below Upper Hydrogeologic Unit
26. Concentrations of Thallium in Groundwater from Monitoring Wells Screened Below Upper Hydrogeologic Unit
27. Concentrations of Ammonia in Groundwater from Monitoring Wells Screened Below Upper Hydrogeologic Unit

**APPENDICES (Continued)**





**PLATES**

**PLATES (Continued)**

## LIST OF ACRONYMS

| | |
|---|---|
| AGI | Amplified Geochemical Imaging |
| AOC | Administrative Order on Consent |
| BRAWP | Baseline Risk Assessment Work Plan |
| CERCLA | Comprehensive Environmental Response, Compensation, and Liability Act |
| CFAC | Columbia Falls Aluminum Company, LLC |
| COPC | Contaminants of Potential Concern |
| CSM | Conceptual Site Model |
| DU | Decision Unit |
| FS | Feasibility Study |
| FT-AMSL | Feet Above Mean Sea Level |
| FT-BLS | Feet Below Land Surface |
| HASP | Health and Safety Plan |
| ITRC | Interstate Technology & Regulatory Council |
| MBMG | Montana Bureau of Mines and Geology |
| MCL | Maximum Contaminant Levels |
| MPDES | Montana Pollutant Discharge Elimination System |
| MDEQ | Montana Department of Environmental Quality |
| ORP | Oxygen Reduction Potential |
| PAH | Polyaromatic Hydrocarbon Compounds |
| PCB | Polychlorinated Biphenyls |
| PCDDs | Polychlorinated dibenzo-p-dioxins |
| PCDFs | Polychlorinated dibenzofurans |
| PID | Photoionization Detector |
| PVC | Polyvinyl Chloride |
| QA/QC | Quality Assurance/Quality Control |
| QAPP | Quality Assurance Project Plan |
| RAO | Remedial Action Objective |
| RI | Remedial Investigation |
| RSL | Regional Screening Level |
| SAP | Sampling and Analysis Plan |
| SLERA | Screening Level Ecological Risk Assessment |
| SOP | Standard Operating Procedure |
| SVOC | Semivolatile Organic Compounds |
| TAL | Target Analyte List |
| TCL | Target Compound List |
| UCL | Upper Confidence Limit |
| USEPA | United States Environmental Protection Agency |
| USGS | United States Geological Survey |
| UST | Underground Storage Tank |
| VOC | Volatile Organic Compounds |

## 1.0 INTRODUCTION

On behalf of Columbia Falls Aluminum Company, LLC (CFAC), Roux Associates, Inc. (Roux), has prepared this Phase I Site Characterization Data Summary Report (Data Summary Report) as part of the ongoing Remedial Investigation/Feasibility Study (RI/FS) of the CFAC facility located in Flathead County, Montana (hereinafter, "the Site"). The RI/FS is being conducted pursuant to the Administrative Settlement Agreement and Order on Consent (AOC) dated November 30, 2015, between CFAC and the United States Environmental Protection Agency (USEPA) (CERCLA Docket No. 08-2016-0002). The purpose of this Data Summary Report is to summarize the results of the Phase I Site Characterization Scope of Work that was completed between January 2016 and November 2016.

### 1.1 Site Background

The Site is located at 2000 Aluminum Drive near Columbia Falls, Flathead County, Montana. The Site is approximately 2 miles northeast from the center of Columbia Falls and the Site is accessed by Aluminum Drive via North Fork Road (County Road 486). The boundaries of the Site were defined in the RI/FS Work Plan (Roux Associates, 2015a) and are depicted in Figure 1. The Site consists of approximately 1,340 acres bounded by Cedar Creek Reservoir to the north, Teakettle Mountain to the east, Flathead River to the south, and Cedar Creek to the west.

The Site was operated as a primary aluminum reduction facility (commonly referred to as an aluminum smelter) from 1955 until 2009. The facility began with two potlines in 1955 and an annual capacity of 67,500 tons per year (using 120 pots per potline). A third potline was added in 1965, and the fourth and fifth potline were added 1968, increasing total aluminum production capacity at the Site to 180,000 tons per year. Aluminum production at the Site was suspended in 2009 due to a downturn in aluminum market conditions, and CFAC announced the permanent closure of the facility in March 2015. A detailed description of the operational history at the Site was provided in Section 2.7.2 of the RI/FS Work Plan (Roux Associates, 2015a).

Buildings and industrial facilities remaining at the Site at the start of the Phase I Site Characterization included offices, warehouses, laboratories, mechanical shops, paste plant, coal tar pitch tanks, pump houses, casting garage, and the potline facility. The Site also includes seven closed landfills, one open landfill that hasn't been used since 2009, material loading and unloading areas, two closed leachate ponds, and several wastewater percolation ponds. A detailed description of each Site feature was provided in Section 3.2 of the RI/FS Work Plan (Roux Associates, 2015a). A map showing the locations of Site features is provided for reference as Figure 2 of this Data Summary Report. Note that the area identified on Figure 2 as the "Backwater Seep Sampling Area" was referred to in the RI/FS Work Plan as the "Seep Area". It has been changed to the "Backwater Seep Sampling Area" because the actual Seep Area is defined in the MPDES Permit (#MT00300066) as the area of the Site where groundwater is expressed to the Flathead River. As shown on Figure 2, the Seep Area as defined in the permit, encompasses a greater length of the Flathead River shoreline than just the Backwater Seep Sampling Area.



## 1.2 Phase I Site Characterization Objectives

The Phase I Site Characterization program was designed to identify and/or confirm source areas and associated chemicals of potential concern (COPCs) outlined in the RI/FS Work Plan (Roux Associates, 2015a), as well as provide a broad characterization of the hydrogeologic conditions and the nature and extent of contamination across the Site and around Site features. As stated in the RI/FS Work Plan, the following objectives were established for Phase I Site Characterization Program:

- Evaluate the conditions at all identified RI areas and Site features to determine which RI areas and Site features require further investigation and/or quantitative evaluation in the Baseline Risk Assessment;
- Refine the list of COPCs that require further investigation at various RI areas and Site features so lists of laboratory analyses can be reduced during subsequent phases of investigation;
- Refine the understanding of groundwater flow and groundwater quality beneath the Site, particularly in the vicinity of potential receptors;
- Develop a more detailed understanding of bedrock topography and the depths, thicknesses and extents of the various hydrogeologic units, both of which may influence groundwater flow and the distribution of COPCs in the subsurface;
- Begin to evaluate seasonal influences on groundwater/surface water interactions and contaminant concentrations in groundwater and surface water;
- Develop data to support the preparation of the Baseline Risk Assessment Work Plan; and

- Develop data to support identification and screening of remedial technologies as part of the FS.

The work summarized in this Data Summary Report was completed in accordance with the RI/FS Work Plan and Phase I Site Characterization Sampling and Analysis Plan (Roux Associates, 2015b) and the Phase I Site Characterization Sampling and Analysis Plan Addendum (Roux Associates, 2016). The work was also completed in general accordance with the "Guidance for Conducting Remedial Investigations and Feasibility Studies under CERCLA" (USEPA, 1988) as well as other appropriate USEPA and Montana Department of Environmental Quality guidance; and the substantive RI/FS requirements of the National Contingency Plan (40 CFR 300) (USEPA, 1994).

## 2.0 PHASE I SITE CHARACTERIZATION PROGRAM

The work that was completed by Roux Associates and its subcontractors as part of the Phase I Site Characterization Program included the following activities:

- Preparation of project operation plans, including a Health and Safety Plan (HASP) (Roux, 2016b) and an Investigation-Derived Waste Management Plan (IDW Management Plan) (Roux, 2016c);
- Additional historical records review;
- Pre-intrusive field activities, including coordination with the salvaging/repurposing contractor, Site reconnaissance, geophysical surveying (Electrical Resistivity/Induced Polarization survey and GPR utility mark-outs), soil gas surveying (landfill gas screening and passive soil gas sampling), and soil sampling from Site drainage structures;
- Site-wide soil borings and soil sampling;
- Incremental soil sampling within the Operational Area;
- Test pits and soil sampling within the Borrow Pit Area;
- GPR surveying of the landfills;
- Test pits within the Asbestos Landfills;
- Monitoring well installation, development, and gauging;
- Groundwater and surface water sampling;
- Sediment sampling;
- Data verification and validation activities; and
- A Screening Level Ecological Risk Assessment (SLERA).



All of the locations that were investigated as part of the Phase I Site Characterization are shown on Plate 1. Selected photographs taken as part of the Phase I Site Characterization are included in Appendix A. All laboratory work summarized in this Data Summary Report was performed by TestAmerica Laboratories Inc. (TestAmerica). Data analysis and project management were primarily completed by TestAmerica's Edison, New Jersey laboratory with support from other laboratories within the TestAmerica network.

The following sections describe the work that was completed as part of the Phase I Site Characterization activities summarized in this Data Summary Report.

## 2.1 Health and Safety Plan

A Site-specific Health and Safety plan (HASP) was developed in accordance with guidelines outlined in OSHA standard 29 CFR 1910.120(b) and submitted under separate cover to USEPA on February 2, 2016. The purpose of the HASP was to identify the safety and health hazards that exist during field operations and to identify procedures and safe work practices to mitigate the hazards. The HASP included a hazard assessment, precautions to be taken to address such hazards, required personal protective equipment, training of personnel, Health and Safety Officer duties, notices and signs, and activities to inform and protect the public. A copy of the HASP was available at the Site at all times during implementation of the work and reviewed by all personnel conducting work. The Phase I Site Characterization field program activities were conducted in accordance with the HASP.

## 2.2 Investigation Derived Waste (IDW) Management Plan

A plan for management and disposal of investigation derived waste (IDW) (Roux, 2016c) was prepared in accordance with the USEPA Guide to Management of Investigation-Derived Wastes (USEPA, 1992). The IDW Management Plan was submitted to the USEPA on May 9, 2016 as an addendum to the Phase I SAP prior to the start of the Phase I Site Characterization field work. IDW was handled throughout the Phase I Site Characterization in accordance with the IDW Management Plan. A summary of IDW disposal completed between April and December 2016 is provided in Section 3.9.

## 2.3 Additional Historical Records Review

The review of historical records continued during the Phase I Site Characterization Program. As part of the review, Roux Associates submitted Freedom of Information Act (FOIA) requests to various governmental agencies, including the USEPA, MDEQ, and U.S. Army Corp of Engineers (USACE). Examples of the types of records requested include, but are not limited to, reports of environmental investigations and remedial actions, records pertaining to hazardous substance or hazardous waste activity (permitting records, waste storage and disposal, release response records), documentation of Site inspections, maps pertaining to any of the above, or any other issues pertinent to the assessment of environmental quality at the Site.

In addition to the FOIA requests, Roux Associates personnel reviewed the historical documents submitted by CFAC as part of the USEPA 104e process with the objective of identifying any additional information that could be relevant to the completion of the RI/FS. Roux Associates personnel also reviewed engineering drawings stored onsite at the CFAC facility in an effort to identify additional information that could be relevant to the conduct of the RI/FS. A summary of the additional historical records review results is provided in Section 3.1.

### 2.4 Pre-Intrusive Investigation Activities

Pre-intrusive investigation activities were conducted prior to, and in preparation for, intrusive activities (i.e., drilling or test pitting). The objective of the pre-intrusive activities was to gain a better understanding of Site conditions prior to implementation of the drilling investigation Scope of Work. The pre-intrusive activities included coordination meetings, Site reconnaissance, an electrical resistivity/induced polarization (ER/IP) geophysical survey, ground penetrating radar (GPR) utility mark-outs, screening of soil gas, passive sampling of soil gas, and sampling of drainage structures. The results of the pre-intrusive activities were summarized in the Phase I SAP Addendum and were considered throughout the implementation of the Phase I Site Characterization drilling activities. The following sections summarize these pre-intrusive investigation activities.



#### 2.4.1 Coordination of Activities with the Salvage/Repurposing Contractor

Employees from Roux Associates, CFAC, and Cascade Drilling (Cascade) met with employees from Calbag Resources, LLC (Calbag) on April 6, 2016 to discuss and coordinate the Phase I Site Characterization field activities to be implemented around and within the Main Plant Area where Calbag is conducting demolition. During the meeting, the parties discussed the Calbag schedule for work activities expected to occur between April and September of 2016. The parties also discussed the health and safety aspects of working around Calbag activities, including the preferred notification process and communication procedures expected when RI/FS work is planned to occur in the Calbag work zones. Communication and coordination between Roux Associates, CFAC, Calbag and Cascade was maintained throughout the work, which helped limit overlapping work zones and prevent any potential safety concerns.

### 2.4.2 Site Reconnaissance

Site reconnaissance activities were initiated by Roux Associates on April 4, 2016 and were completed on April 16, 2016. As part of Site Reconnaissance, Roux Associates personnel visited each Site feature and all proposed drilling locations and existing well locations described in the RI/FS Work Plan and Phase I SAP. Each location was inspected and any pertinent observations and location adjustments were noted on field datasheets. A summary of the Site reconnaissance observations, field data sheets, and photographs is provided in Section 2.0 of the Phase I SAP Addendum.

### 2.4.3 Geophysical Surveying

This section provides a summary of the geophysical surveying activities that were completed as part of the pre-intrusive activities.



#### 2.4.3.1 Electrical Resistivity/Induced Polarization Survey

Spectrum Geophysics, working as a subcontractor to Roux Associates, was onsite from April 18, 2016 through April 22, 2016 to complete an electrical resistivity (ER) / induced polarization (IP) geophysical survey. The survey was conducted across six transects at the Site (Figure 3) in accordance with the Geophysical Work Plan prepared by Spectrum Geophysics dated March 23, 2016. The objective of the ER/IP survey was to develop a preliminary understanding of approximate depth to bedrock, approximate depth to groundwater, approximate depth of landfills, potential changes in subsurface hydrogeological conditions and potentially other subsurface anomalies that may contribute to the delineation of source areas.

The results of the ER/IP survey were summarized in a summary report prepared by Spectrum Geophysics and submitted to the USEPA on July 21, 2016 (Appendix B). A summary of the results are provided in Section 3.2.3.1.

#### 2.4.3.2 Ground Penetrating Radar Utility Mark Outs

Shari A. Johnson & Associates Engineering, PLLC (SAJ&AE) performed utility mark-outs utilizing ground penetrating radar (GPR) geophysical survey techniques during the week of May 9, 2016. The GPR was used to identify potential utilities and/or other subsurface obstructions in the immediate vicinity of each proposed drilling location. The identified utilities were marked in the field with spray paint and were noted by Roux Associates personnel utilizing a hand-held GPS (with sub-meter accuracy). Final drilling locations were modified where necessary based on the findings of the survey. A summary of the GPR survey results is provided in Section 2.8 of the Phase I SAP Addendum.

### 2.4.4 Soil Gas Survey

A soil gas survey was conducted by Roux Associates personnel as a screening method to assess for the potential presence of volatile organic compounds (VOC) within selected Site features as specified in the Phase I SAP.

The soil gas investigation consisted of two elements: 1) field screening of landfill soil gas; and 2) passive soil gas samples collected at the Former Hazardous Waste Drum Storage Area and the former Operational Area. A description of the work associated with each element is described below.



#### 2.4.4.1 Landfill Soil Gas Screening

Roux Associates personnel conducted field screening of soil gas utilizing a landfill gas meter and photo-ionization detector (PID) to assess for the presence of methane and other VOCs at five landfill areas across the Site; including: the Wet Scrubber Sludge Pond, West Landfill, Sanitary Landfill, Center Landfill, and Industrial Landfill. The soil gas screening locations are shown on Figure 4.

Between April 18, 2016 and April 25, 2016, Roux Associates field personnel completed screening by manually installing the soil gas probe to depths of three to five ft-bls at four locations within the Wet Scrubber Sludge Pond and two locations within the Center Landfill. Additionally, ten existing landfill vents within the West Landfill (also shown on Figure 4) were also screened.

Roux Associates personnel were unable to manually install the soil gas probe at locations proposed in the West, Industrial and Sanitary landfills due to probe refusal at approximately 1 to 2 feet below land surface (ft-bls). Observations by the field personnel indicate that the soils in this interval consist of compacted coarse gravel, cobbles or boulders which consistently prevented the soil gas probe from being advanced any deeper. Roux Associates personnel subsequently attempted to utilize a commercially available mechanical auger drill in an effort to bypass the refusal depth. However, refusal was still encountered between 1 to 2 ft-bls.

Roux Associates discussed the probe installation refusals with the USEPA during a project meeting held on May 25, 2016. It was agreed that at the locations where refusal was encountered, a Geoprobe direct push rig would be utilized in an attempt to install the temporary soil gas probes. On June 4 and June 5, 2016, Roux Associates utilized a Geoprobe direct push rig operated by Cascade to complete the soil gas screening at all locations within the West, Sanitary, and Industrial Landfills.

A summary of the field methods and results of the landfill soil gas screening was provided in Section 2.6.1 of the Phase I SAP Addendum. A review of the landfill soil gas screening results is also provided in Section 3.2.1 of this Data Summary Report for reference. Field data sheets with the soil gas screening results are provided in Appendix C.



#### 2.4.4.2 Passive Soil Gas Investigation

A passive soil gas investigation was conducted by Roux Associates from April 18 to 23, 2016, with the objective of identifying any potential areas where VOCs may be present so that subsequent intrusive sampling could be focused in those areas. The passive soil gas investigation was conducted using Amplified Geochemical Imaging, LLC (AGI) passive sampling devices at ten locations; including eight locations within the former drum storage area to the west of the West Landfill, and two locations within the Operational Area (at a former storage area between the Main Plant area and Wet Scrubber Sludge Pond) as shown on Figure 5. A summary of the field methods and results of the passive soil gas sampling was provided in Section 2.6.2 of the Phase I SAP Addendum. A review of the passive soil gas results is also provided in Section 3.2.2 of this Data Summary Report for reference.

### 2.4.5 Drainage Structure Sampling

Accessible drainage structures associated with the former plant operations were inspected by Roux Associates personnel from April 12 to 15, 2016, to screen for the potential presence of COPCs based upon visual observation of staining, or the presence of odors and PID readings.

Observations made as part of the drainage structure evaluation were summarized in Section 2.5 of the Phase I SAP Addendum. In conjunction with the inspection activities, soil samples were collected from four drainage structures that were able to be opened and accessed with hand tools, and had soil/sediment accumulations at the bottom of the structure. Results of the drainage structure sampling were summarized in Section 2.5.1 of the Phase I SAP Addendum.

Based on the results of the initial drainage structure sampling activities, the three drainage structures with the highest concentrations of COPCs in soil, CFDS-005, CFDS-007, and CFDS-013, were selected for further investigation as part of the Phase I drilling Scope of Work to evaluate the subsurface soils beneath each structure. Soil borings were completed by Cascade on July 14 and 15, 2016. At each location, a soil boring was advanced through the bottom of the drainage structure utilizing the sonic drilling technique as described below in Section 2.6.

A soil sample was collected from the two-foot interval beneath the bottom of the structure. If field screening of this initial sample indicated evidence of potential impact, deeper samples were collected in an effort to delineate the vertical extent of the impacts, if any, beneath the structure. The analyses performed on soil samples collected from the drainage structure locations were the same as performed on Site-wide soils described below in Section 2.6. Drainage structure soil boring locations are shown on Plate 2. Field data sampling sheets associated with drainage structure soil sampling are included as Appendix C. A summary of the soil sampling results from drainage structure drilling locations is provided in Section 3.4.3.



## 2.5 Phase I SAP Addendum

Roux Associates submitted the final Phase I SAP Addendum to the USEPA on August 17, 2016. The objectives of the Phase I SAP Addendum were to: present the results of Site reconnaissance activities completed in April 2016, present the results of pre-intrusive activities, and to provide a summary of the proposed modifications to the Field Sampling Plan (FSP) and Quality Assurance Project Plan (QAPP) originally provided in the Phase I SAP.

Additional field modifications which occurred subsequent to submittal of the final Phase I SAP Addendum were documented in Field Modification Forms submitted to the USEPA and approved by the USEPA as described below in Section 2.15.

## 2.6 Site-Wide Soil Borings and Soil Sampling

The Site-wide soil boring and soil sampling was conducted from May 18, 2016 to August 31, 2016. The drilling activities were performed by Cascade Drilling of Federal Way, Washington, under Roux Associates and Hydrometrics oversight. A total of 124 soil borings were advanced and approximately 419 soil samples were collected at and in the vicinity of Site features; with the objective of confirming potential source areas identified in the preliminary CSM presented in the RI/FS Work Plan and to identify any potential additional source areas.

Soil borings were completed utilizing sonic-rotary methods and/or direct push techniques with Geoprobe™ technology as described in the Phase I SAP; with the exception of two soil borings within the South Percolations Ponds which were completed utilizing hand tools in accordance with the Phase I SAP Modification #7 as described in Section 2.15. At all of the soil boring locations, continuous core samples were collected from land surface to the bottom of the borehole in an effort to obtain lithologic and soil screening data. All of the soil samples were described in accordance with the Unified Soil Classification System (USCS) with observations recorded in a field book. The core samples were examined for evidence of potential impacts (i.e., staining, odor) and screened for the potential presence of VOCs using a PID. The final depth of each soil boring varied from 4 ft-bls to 300 ft-bls depending on the purpose and location of the boring. Soil boring logs are included as Appendix D.



At soil boring cluster locations where both water table and deeper monitoring wells were to be installed (described in Section 2.11.1), the soil boring for the deeper well was drilled first. This boring was advanced until one of the three following criteria was met: 1) the top of bedrock was encountered; 2) a maximum depth of 300 feet below land surface was reached without encountering bedrock; or 3) a shallower depth, at the discretion of the field geologist in consultation with the management team, if a deeper water-bearing hydrogeologic unit was encountered beneath a significant sequence of low permeability material.

Soil borings not completed as monitoring wells were abandoned using grout and/or bentonite chips, with the top three feet of each boring backfilled with soil cuttings. If visual impacts were observed during field screening of soils, the cuttings were drummed for disposal and only clean material was used for backfill.

Three soil samples were typically collected for laboratory analyses from each soil boring within unpaved areas: a surface soil sample was collected from the top six inches of soil; a shallow soil sample from the interval of 0.5 to 2 ft-bls; and an intermediate depth soil sample from a depth of 10 to 12 ft-bls. In paved areas the surficial sample was omitted (due to pavement or solid surface covering) and the shallow sample was collected from the 2-ft depth interval immediately beneath the surface covering materials. At deep monitoring well locations an additional soil sample was typically collected from the depth interval located five to ten feet below the depth of the water table (as estimated during drilling).

Three opportunistic soil samples were also collected and sent for laboratory analyses based on visual observations and/or soil screening results encountered during soil boring activities, including:

- CFMW-028a – collected from the 4 - 6 ft-bls interval due to the presence of black stained soils consistent with those observed within the adjacent Northeast Percolation Pond.
- CFSB-131 – collected from the 18 - 20 ft-bls interval due to the presence of elevated PID screenings (395 ppm) and visual petroleum impacts (i.e. staining/free product).
- CFSB-131 – a sample was collected from the 22 - 23 ft-bls interval which represented the interval beneath the petroleum impacted interval described above.



Table 1 summarizes the soil samples collected during the Phase I Site Characterization. Sample field data sheets are included as Appendix C.

Soil samples were packaged and shipped under chain-of-custody to TestAmerica and analyzed for:

- Target Compound List (TCL) VOCs (excluding surface soil samples) via USEPA Method 8260;
- TCL SVOCs via USEPA Method 8270;
- TAL Metals via USEPA Method 6010;
- TCL PCBs via USEPA Method 8082;
- TCL Pesticides (select surface samples only) via USEPA Method 8081;
- Total Cyanide via USEPA Method 9012; and

- Fluoride via USEPA method 300.

Soil samples collected from the five to ten feet below the water table interval at deep monitoring well locations were analyzed for:

- Total Cyanide via USEPA Method 9012; and
- Fluoride via USEPA method 300.

In addition to the sampling and analyses listed above, 28 soil samples collected from the surface interval (0 – 0.5 ft-bls) were analyzed for lead in sieved form (i.e., finer fraction of the sample) in addition to bulk form. At each location where a sieved lead sample was collected, the sample was passed through a 250 microns/No. 60 sieve in the field prior to collection. Also, all 39 soil samples collected within the Rectifier Yards were analyzed for polychlorinated dibenzo-p-dioxins (PCDDs) and polychlorinated dibenzofurans (PCDFs) via USEPA Method 8290.



While drilling deep soil borings, each discrete soil sample was also analyzed for total organic carbon; and, select samples were collected for geotechnical analysis (including grain size, bulk density, and moisture content analysis) within the major water bearing units and low permeability units.

## 2.7 Operational Area Soil Investigation

As described in the RI/FS Work Plan, the "Operational Area" comprises approximately 43 acres north of the Main Plant Area where aerial photographs indicate historical operations may have been conducted but no known source area exists. An incremental soil sampling program was conducted within the Operational Area to assess whether any potential source areas are present in this area. The work was performed in accordance with the Scope of Work outlined in the Phase I SAP as well as SAP Field Modification #4 (described in Section 2.15).

The Operational Area soil investigation was conducted from June 14, 2016 to July 26, 2016. The Operational Area was divided into 43 grid cells, also referred to as Decision Units (DUs); each approximately one acre in size. Sampling was conducted at the frequency of one incremental surface soil sample (0 to 0.5 ft-bls) and one incremental shallow soil sample (0.5 to

2 ft-bls) per DU, for a total of 43 incremental soil samples from each interval. The grid where samples were collected in the Operational Area is shown on Plate 3.

Each incremental soil sample consisted of 32 discrete grab samples that were randomly distributed within the four quadrants of each grid (i.e., 8 samples per quadrant). The coordinates of the random locations were established using GIS and a random number generator. Field personnel utilized a hand-held GPS (with sub-meter accuracy) to navigate to each of the 32 sample locations within each grid for sample collection.

At each location, Cascade, under Roux Associates/Hydrometrics oversight, advanced a sampler using a Geoprobe™ direct push rig to a depth of 2 ft-bls. Samples were collected using one of the two following protocols:

Samples from the first 15 DUs (designated CFISS-001 through CFISS-015) were collected using incremental sampling methodology (ISM) field processing methods. The ISM field processing included the hand removal of coarse grained material greater than approximately 0.5 inches in diameter, and field mixing of the soil volumes from the 32 grab samples. As documented in Field Modification #4 (Section 2.15), field processing by Roux Associates/Hydrometrics was discontinued at the request of USEPA since the field processing method did not include drying and breaking up of soil aggregates and/or sieving, as would be done in the lab processing of incremental soil samples.

Samples from the remaining 28 DUs were instead collected using the “wedge” approach as defined in the Interstate Technology and Regulatory Council (ITRC) February 2012 guidance document titled “Incremental Sampling Methodology” and discussed in the Roux SOP 5.12 titled Incremental Soil Sampling. A “wedge” of soil from the Geoprobe core at each of the 32 boring locations within a specific grid cell was collected from the entire length of the targeted depth interval. Individual wedges, approximately 1-ounce (oz) by volume each, from the 32 locations were then combined to form the complete the approximately 1-kilogram composite samples for the DU. Composite soil samples were shipped to TestAmerica for processing prior to analysis in accordance with the laboratory ISS SOP included with the Phase I SAP Addendum.

After processing, each sample was analyzed for:

- TCL SVOCs via USEPA Method 8270;
- TAL Metals via USEPA Method 6010;
- TCL PCBs via USEPA Method 8082;
- TCL Pesticides (surface samples only) via USEPA Method 8081;
- Total Cyanide via USEPA Method 9012; and
- Fluoride via USEPA method 300.

In addition to the sampling listed above, nine soil samples collected from the surface interval (0 – 0.5 ft-bls) were sieved in the laboratory (250 microns/No. 60 sieve) and analyzed for lead in the sieved form in addition to bulk form. Sample field data sheets are included as Appendix C.



As noted above and documented in Field Modification #4 (Section 2.15), field processing by Roux Associates/Hydrometrics was discontinued at the request of USEPA after sampling the first 15 DUs (CFISS-001 through CFISS-015); following which samples were shipped to TestAmerica for laboratory controlled pre-processing and preparation in accordance with their SOP for ISM sampling. As part of this modification, three DUs (designations CFISS-002, CFISS-006, and CFISS-008) were re-sampled to allow for a comparison of the results from the two methods (field processing vs. laboratory processing), and for assessment of whether or not the initial field processing approach could have resulted in a low or high bias relative to the laboratory processing methods. The results of the comparison are provided in Section 3.4.1.5.

## 2.8 Background Area Soil Investigation

On April 18 and 19, 2016, Cascade, under Roux Associates/Hydrometrics oversight, completed eight soil borings within background areas of the Site. As described in the RI/FS Work Plan, the Background Area was generally defined to include the western open field portion of the Site, where historical aerial photographs dating back to the 1940s show un-forested areas with no evidence of industrial operations. As part of the Background Area soil investigation, soil samples were collected to assess background soil quality conditions as a reference for comparison to soil quality conditions in other areas of the Site.

The locations of the eight soil borings completed within the Background Area are shown on Plate 2. The soil boring and sampling within the Background Area was conducted via direct-push drilling technique following the same protocol as for borings described above in Section 2.6. At each boring location samples collected for laboratory analysis included one surface soil sample (0 to 0.5 ft-bls), one shallow soil sample (0.5 to 2 ft-bls), and one deep soil sample from 10-12 ft-bls. The 24 soil samples collected within the Background Area were analyzed for the same analyses described in Section 2.6. Sample field data sheets are included as Appendix C.

## 2.9 Borrow Pit Area Soil Investigation

Watson Excavating, a subcontractor to Cascade, under Roux Associates oversight, performed test pit excavations in the southeastern portion of the Site defined as the Borrow Pit Area. The Borrow Pit Area is defined in the CFAC Borrow Pit Open Cut Permit filed with the Montana Department of Environmental Quality (MDEQ) (Permit #2724, October 29, 2015). Based upon review of the historical Site information and aerial photographs previously submitted to USEPA with the Remedial Investigation Work Plan, no industrial Site operations were conducted within the Borrow Pit Area.



As described in Field Modification #6 (Section 2.15), Roux Associates personnel collected soil samples from the test pits within the Borrow Pit Area to provide an initial evaluation of soil conditions within this area and to support decisions regarding the acceptability of soil from the Borrow Pit Area for use as fill material as part of the ongoing Site demolition activities being performed by Calbag. Test pitting activities within the Borrow Pit Area were conducted on August 25 and 26, 2016. Seven test pits were excavated to a depth of 12 ft-bls to facilitate the collection of soil samples. Borrow Test Pit locations are shown on Plate 2. Soil sampling at the test pit locations within the borrow pit area was conducted from three intervals, including one surface soil sample (0 to 0.5 ft-bls) prior to commencing excavation, and two intermediate depth samples (2 to 4 ft-bls and 10 to 12 ft-bls) in accordance with SAP Field Modification #6. The samples from the 2-4 ft-bls interval were collected from the test pit sidewalls using hand tools while the deeper sample from the 10-12 ft-bls interval was collected directly from the excavator bucket. Twenty-one soil samples were collected and analyzed by the same methods outlined in Section 2.6. Sample field data sheets are included as Appendix C.

## 2.10 Landfill Investigations

As part of the soil and groundwater investigations described in Sections 2.6 and 2.11, soil borings and monitoring wells were completed adjacent to each landfill to evaluate if and to what extent the landfills (and which landfills in particular) are sources of COPCs in soil and groundwater. Additional landfill investigation activities were conducted to provide initial information regarding landfill caps (if present) at the various landfills and to generate additional information that may be required to evaluate remedial alternatives for the landfills.

The additional landfill work included:

- GPR survey with the objective of assessing of the presence of cap material, and potential uniformity and thickness of the cap across the landfill; and
- Test pitting to visually evaluate the contents of asbestos landfills.

### 2.10.1 GPR Survey of Landfills

SAJ&AE, under the oversight of Roux Associates, performed a GPR survey within the landfill areas on July 26 and 27, 2016. The objective of the GPR survey was to evaluate the potential presence of landfill caps and thickness of caps, if present, for each landfill area. The GPR survey consisted of ten transects across five landfills, as shown on Figure 6. At each transect location, the GPR equipment, manufactured by US Radar, used a 250MHz antennae to send a signal down through the landfill layers. The cap, if present, could potentially be differentiated from the underlying landfill materials and native materials because of differences in the dielectric constant properties of the materials. A graphical representation of each transect was presented to document the thickness and extent of the cap, where observed. The results were summarized in the *Ground Penetration Radar Survey – Landfill Summary Report* provided by SAJ&AE included as Appendix E. A summary of the results are provided in Section 3.2.3.2.

### 2.10.2 Asbestos Landfill Test Pitting

Cascade, under Roux Associates oversight, conducted test pitting activities from August 15 to 18, 2016 within the Asbestos Landfills in order to further define the extent and contents of the landfills. A certified asbestos inspector provided by Hydrometrics was present throughout the duration of the test pit activities. The test pitting consisted of seven test pits excavated to approximately 10 ft-bls within the South Asbestos Landfill and eight test pits excavated to approximately 10 ft-bls within the North Asbestos Landfill. Test pit locations are shown on Figure 7.

At each test pit location, Roux Associates personnel, in consultation with the asbestos inspector, recorded visual observations in the field notebook. The presence, or lack thereof, of visual asbestos was noted at each test pit location. The presence of other materials was also noted where present in the test pits. After visual inspections, the excavated materials were placed back in the excavation.

### 2.11 Site-Wide Groundwater and Surface Water Investigation

This section describes the Site-wide investigation of groundwater and surface water.

#### 2.11.1 Monitoring Well Installation

From May 18, 2016 to August 31, 2016, in conjunction with the soil investigation, Cascade installed 44 monitoring wells; including, 28 water table monitoring wells and 16 deeper monitoring wells. All monitoring wells were drilled and installed using sonic drilling techniques. The new monitoring well locations were selected to supplement the existing monitoring well network at the Site to support further evaluation of groundwater quality in potential source areas and in areas that have not previously been monitored, while also helping to refine the understanding of Site groundwater flow. Plate 4 shows the locations of all monitoring wells at the Site. Table 2 summarizes the construction details for the monitoring wells at the Site.



Water table monitoring wells were typically installed with the top of the screened interval located approximately 5 to 10 feet below the observed groundwater table at the time of drilling to account for seasonal fluctuations in groundwater elevations. Deep monitoring wells were installed to evaluate the vertical extent of COPCs in groundwater and to evaluate groundwater flow within deeper hydrogeologic units. The screened intervals of the deep wells were determined by Roux Associates personnel based on field observations made during drilling, and were typically set below the first low-permeability unit observed during drilling.

All new monitoring wells were constructed of 2-inch diameter Schedule 40 polyvinyl chloride (PVC) casing with 10 feet of 2-inch diameter, 20-slot (0.020 inches) PVC screen flush-threaded onto the PVC casing, with the exception of one monitoring well (CFMW-016a) that was installed with a five-foot screen as described in SAP Modification #3. The casing was placed down the open hole and a sand filter pack of 10/20 silica sand was placed around the screen from the bottom of the borehole to approximately two to three feet above the screened depth. The annulus above the filter pack was sealed with a two to three foot hydrated bentonite seal. A cement-bentonite grout was then placed in the annulus above the bentonite seal to the surface with the tremie pipe method. The sonic casing was vibrated and removed throughout the grout placement process.



At deep monitoring well locations where potential low permeability units beneath the water table were encountered during the drilling of soil borings (as evidenced by lithology observed in the continuous core samples), double-cased sonic drilling procedures were used to hydraulically isolate the upper groundwater system from the deeper hydrogeologic unit(s); thereby minimizing any potential for cross contamination. Double casing was completed utilizing a two casing system. A 6” inner casing (same casing used on all monitoring wells) was first drilled to the depth of the low permeability unit determined based on the lithology. A larger, 7” outer casing was advanced over the 6” inner casing into the layer of low permeability, sealing off the upper unit. The inner, 6” casing was then advanced to the terminal depth of the boring. Once the terminal depth was reached, grout was placed via a tremie pipe to backfill the borehole to the desired depth of the deep well. The grout was allowed to cure overnight at each deep location to allow for potential settling and hardening. Bentonite pellets were utilized to fill any remaining space in the hole above the grout to reach the desired depth to set the well. The casing was then placed down the open hole and a sand filter pack of 10/20 silica sand was placed around the screen from the bottom of the borehole to approximately two to three feet above the screened depth. The annulus immediately above the filter pack was sealed with a two to three foot hydrated bentonite seal. The remaining annular space of the borehole was then filled with a cement-bentonite grout while vibrating and extracting both the inner and outer casing.

Surface completion of each well consisted of a protective stick-up enclosure with a locking J-plug and an exterior lockable metal cover. Following surface completion, all newly installed monitoring wells, as well as existing monitoring wells, were surveyed by Sands Surveying Inc. (Sands) of Kalispell, Montana for horizontal (North American Datum [NAD] 83) and vertical (North American Vertical Datum [NAVD] 88) coordinates within the Montana State Plane Coordinate System (FIPS2500). Survey data is included on Table 2. Monitoring well boring logs are included as Appendix D.

Newly-constructed monitoring wells were developed and allowed a minimum of one-week to equilibrate with the surrounding formation prior to sampling. The development was completed by Cascade using a surge block and submersible pump. The surge block was used inside the well to flush fine sediments from the sand filter. After the well was surged, a submersible pump was lowered into the well and groundwater was withdrawn. As outlined in the Phase I SAP Addendum, CFAC removed the existing downhole equipment from all existing monitoring wells and the existing monitoring wells were also redeveloped prior to groundwater gauging and sampling. Temperature, pH, ORP, dissolved oxygen, specific conductance and turbidity readings were monitored and pumping proceeded during development of each monitoring well until the discharge water met a field turbidity value of 10 formazin nephelometric units/nephelometric turbidity units (FNU/NTU) or less; or, until the field turbidity did not improve for a period of two hours during active development. Approximately 24 monitoring wells out of 64 wells did not achieve a value of 10 FNU/NTU after two hours of development. Monitoring well development field data sheets are included as Appendix C.



### 2.11.2 Groundwater Gauging and Sampling

Site-wide groundwater levels were measured by Roux Associates on August 30, 2016 and November 29, 2016 (Table 3). Groundwater levels were collected with an electronic water-level meter capable of measuring fluid elevation within an accuracy of 0.01 ft. All groundwater level measurements were collected on the same day to provide a snapshot of the Site-wide conditions. Additionally, six monitoring wells were fitted with pressure transducers to evaluate groundwater elevation fluctuations in response to short term precipitation events as well as in response to longer term seasonal trends at the Site. The pressure transducers were programed to collect automated measurements every 30 minutes.

Roux Associates and Hydrometrics performed groundwater sampling at 60 monitoring well locations from September 9, 2016 through September 21, 2016. Groundwater samples were collected from all existing monitoring wells, with the exception of four monitoring wells (CFMW-016, CMFW-017, CFMW-018, and CFMW-025) that were dry during the sampling event. Samples were collected in accordance with the RI/FS Work Plan, SAP, and SAP Addendum. Samples collected during the September 2016 groundwater sampling event are summarized in Table 4.

Groundwater samples were collected using the methods described in the USEPA guidance document titled "Ground Water Sampling Procedure, Low Stress (Low Flow) Purging and Sampling" (USEPA, 2010). During purging, a water quality meter was used to monitor water quality indicator parameters such as pH, conductivity, DO, ORP, temperature, and turbidity. The field parameters were recorded on monitoring well sampling field data sheets which are included as Appendix C.

Groundwater samples were analyzed for:

- Dissolved TAL metals via USEPA Methods 200.7 / 200.8 / 245.2 / 6010C / 6020A / 7470A;
- Total cyanide via USEPA Method 335.4; and
- General chemistry including Fluoride via USEPA method 300, alkalinity via method SM2320B, and hardness via method 2340B;
- Nutrients including Chloride and Sulfate via USEPA method 300.0, Nitrate and Nitrite as N via USEPA method 353.2, ammonia nitrogen via USEPA method 350.1/350.3, and orthophosphate as P via USEPA method 365.1; and
- Total dissolved solids (TDS) and total suspended solids (TSS) via methods SM 2540C/D.

The initial groundwater samples collected adjacent to potential source areas also included the following additional analytes:

- TCL VOCs via USEPA Method 8260; and
- TCL SVOCs via USEPA Method 8270.

All groundwater samples submitted for analysis of dissolved metals were field filtered using a standard 0.45-micron filter.

Groundwater levels and samples will continue to be collected on a quarterly basis for a period of one year to further characterize groundwater beneath the Site during varying seasonal conditions. Results of future groundwater sampling events will be included in future data summary reports.

**2.11.3 Surface Water Sampling**

Surface water samples were collected from Site surface water features that were observed to contain water during the Phase I Site Characterization Program. Surface water sampling locations are shown on Plate 5 and are summarized on Table 4. The original schedule called for the surface water sampling to be performed in September 2016, in conjunction with the first round of groundwater sampling. However, during the initial Site reconnaissance it was determined that some surface water samples should be collected earlier than scheduled in anticipation that several of these surface water areas could dry out over the summer months. As a result, surface water samples were collected during two sampling events.



From June 6, 2016 to June 7, 2016, ten surface water samples were collected from selected surface water bodies that were anticipated to dry out over the summer months. These locations included the three locations in the South Percolation Ponds, the five locations in the Cedar Creek Reservoir Overflow Ditch, and two locations in the northern area of the Site where surface water was observed (referred to as the Northern Surface Water Feature on Figure 2). Surface water was not present within the Northwest and Northeast Percolation ponds; therefore, surface water samples were not collected from these locations.

From August 29, 2016 to September 16, 2016, 12 surface water samples were collected from within the Flathead River, the Backwater Seep Sampling Area, and Cedar Creek. These locations were determined to be wet throughout the entire year. Similar to the June sampling event, surface water samples were not collected within the Northwest and Northeast Percolation ponds due to an absence of surface water.

During the initial site reconnaissance, several surface water and sediment sample locations along the Flathead River were deemed inaccessible by foot due to the presence of forested areas and limited bank/shoreline for traversing. In accordance with Field Modification #8 (described in Section 2.15), Roux Associates collected surface water samples from Flathead River with the use of a boat provided by Kennedy/Jenks Consulting (Whitefish, Montana). A captain representative of Kennedy/Jenks Consulting steered the boat through the river, and surface water samples were collected from the boat by taking a grab sample directly from the waterbody using the sample collection container for each analysis.

As part of the sample collection activities within the surface water bodies, the surface water was field screened with a water quality meter to evaluate water quality parameters; including: temperature, conductivity, pH, turbidity, dissolved oxygen, and oxygen reduction potential (ORP). The water quality meter was placed directly in the surface water body and monitored until stable readings were observed. The readings were recorded on a field datasheet and the location within the surface water body was logged with GPS technology with sub-meter accuracy. Surface water sample field data sheets are included as Appendix C.



Surface water samples were analyzed for:

- Total recoverable TAL metals via USEPA Methods 200.2 / 200.7 / 200.8 / 245.2 / 6010C / 6020A / 7470A;
- Total cyanide via USEPA Method 335.4;
- General chemistry including Fluoride via USEPA method 300, alkalinity via method SM2023B, and hardness via USEPA method 200.7;
- Nutrients including Chloride and Sulfate via USEPA method 300.0, Nitrate and Nitrite as N via USEPA method 353.2, ammonia nitrogen via USEPA method 350.1 / 350.3, and orthophosphate as P via USEPA method 365.1; and
- Total dissolved solids (TDS) and total suspended solids (TSS) via methods SM 2540C/D.

The initial surface water samples collected within the South Percolation Ponds were also analyzed for the following additional analytes:

- TCL VOCs via USEPA Method 8260;
- TCL SVOCs via USEPA Method 8270;

- TCL PCBs via USEPA Method SW8082; and
- TCL Pesticides via USEPA Method 8081.

Surface water samples will continue to be collected on a quarterly basis for a period of one year to further characterize surface water conditions at the Site during varying seasonal conditions. Results of future surface water sampling events will be included in future data summary reports.

### 2.11.4 Surface Water Discharge

As part of the surface water sampling events, the discharge of Cedar Creek and Cedar Creek Drainage Overflow were measured utilizing a mechanical current-meter method in accordance with Roux SOP 6.7. The stream channel cross section was divided into equal vertical subsections. In each subsection, the area was calculated by measuring the width and depth of the subsection, and the water velocity was determined using a current flow meter. The discharge in each subsection was computed by multiplying the subsection area by the measured velocity and the total discharge was determined by summing the discharge of each subsection. Stream discharge calculations are provided in Appendix F.



The elevation of the bottom of Cedar Creek and Cedar Creek Drainage Overflow were surveyed at two locations by Sands Surveying as part of the surface water activities. The elevations were utilized during the evaluation of surface water and groundwater interactions as described in Section 3.3.2.3.

A temporary staff gauge was installed within the Flathead River to enable measurement of river level conditions immediately adjacent to the Site. The temporary staff gauge was surveyed by Sands Surveying and staff gauge readings were recorded in conjunction with each groundwater level gauging event. Levels will continue to be evaluated during future sampling events and potentially used to correlate with the USGS station 12363000, located down river of the Site.

## 2.12 Sediment Sampling

On August 29, 2016 and from September 6 to 9, 2016, sediment samples were collected from the same locations as surface water samples immediately following the collection of surface water samples at each location. The sediment sampling also included two locations within the

Northwest and Northeast Percolation Ponds where surface water samples were not collected due to the absence of surface water within those features. Sediment samples were collected when river stage levels were low such that the Flathead River would most likely be acting as a gaining stream. Sediment sample locations are shown on Plate 5 and are summarized on Table 5.

Note that not all sediment sample locations contained unconsolidated materials that meet the technical definition of sediment. As defined by USEPA, suspended and bedded sediments (SABs) are "particulate organic or inorganic matter that suspends in or are carried by the water, and/or accumulate in a loose, unconsolidated form on the bottom of natural water bodies" (USEPA, 2003). During sampling, Roux Associates personnel utilized a probing rod and visual inspections to evaluate the presence of sediment. Accumulations of loose, unconsolidated, bedded sediments were only identified at all locations within Cedar Creek, the North and South Percolation Ponds, the Backwater Seep Sampling Area of the Flathead River, and one location within Flathead River. The remaining proposed sample locations, including five locations in the Flathead River and all locations in the Cedar Creek Overflow Drainage, did not appear to be depositional areas based upon the absence of any loose, unconsolidated sediment. At the proposed sampling locations where sediments were absent, a surface soil sample was collected and noted as such on the sample field data sheets.



Gravel and larger sized grains were removed from the sample by placing the grab sample from immediately beneath the subsurface through a size 10 sieve prior to packaging and shipment for laboratory analysis. Sediment samples were analyzed with the same analytical methods as soils described in Section 2.6.2, including grain size analysis and total organic carbon. Sample field data sheets are included in Appendix C.

### 2.13 Field QA/QC Audits

Four QA/QC field audits were conducted by the Roux Associates Project QA Officer during the Phase I Site Characterization Program. The major sampling activities that were audited included soil gas screening/passive soil gas sampling, soil logging and sampling, groundwater gauging and sampling, and surface water and sediment sampling. The audits focused mainly on measurement and sampling procedures, to ensure that representative data was being generated in the field. The audits occurred during the early implementation phase of each activity to allow for timely corrective action, if needed, prior to the generation of a significant amount of data. The field audits also ensured that data being collected during the RI meets the DQOs outlined in the RI/FS Work Plan and Phase I SAP. Completed field audit forms are included as Appendix G.

### 2.14 Laboratory Data Verification and Validation Activities

Laboratory data were reviewed by Laboratory Data Consultants, Inc. of Carlsbad, California, a qualified, third-party data validator. Validation of laboratory data was performed in accordance with the following USEPA guidance:

- *National Functional Guidelines for Organic Data Review* (USEPA, 2014a);
- *National Functional Guidelines for Inorganic Data Review* (USEPA, 2014b); and
- *Guidance for Labeling Externally Validated Laboratory Analytical Data for Superfund Use* (USEPA, 2009).

All laboratory data packages were verified and validated using a Stage 4 validation to evaluate whether the data meet the performance and acceptance criteria. The Stage 4 validation was performed on 100% of the laboratory data generated during the RI/FS. As described in the guidance (USEPA, 2009), the Stage 4 verification and validation included completeness and compliance checks of sample receipt conditions, both sample-related and instrument-related QC results, recalculation checks, and the review of actual instrument outputs.

The data validator documented all findings by adding appropriate validation qualifiers (as necessary) to the sample results in the laboratory data packages based on the various verification and validation tasks. The following qualifiers were applied to the data where applicable to identify data limitations identified during validation:

**J+** .................. (Estimated, High Bias): The compound or analyte was analyzed for and positively identified by the laboratory; however, the reported concentration is estimated, displaying high bias, due to non-conformances discovered during data validation.

**J-** .................. (Estimated, Low Bias): The compound or analyte was analyzed for and positively identified by the laboratory; however, the reported concentration is estimated, displaying low bias, due to non-conformances discovered during data validation.

**J** .................. (Estimated, Bias Indeterminate): The compound or analyte was analyzed for and positively identified by the laboratory; however, the reported concentration is estimated due to it being below the laboratory quantitation limit or due to non-conformances discovered during data validation. Bias is indeterminate.

**U** .................. (Non-detected): The compound or analyte was analyzed for and positively identified by the laboratory; however, the compound or analyte should be considered non-detect at the reported concentration due to the presence of contaminants detected in the associated blank(s).

**UJ** .................. (Non-detected estimated): The compound or analyte was reported as not detected by the laboratory; however, the reported quantitation/detection limit is estimated due to non-conformances discovered during data validation.

**R** .................. (Rejected): The sample results were rejected due to gross non-conformances discovered during data validation. Data qualified as rejected is not usable.

**NA**.................. (Not Applicable): The non-conformances discovered during data validation demonstrates a high bias, while the affected compound or analyte in the associated sample(s) was reported as not detected by the laboratory and did not warrant a qualification of the data.

Additionally, flags classified as P (Protocol) or A (Advisory) to indicate whether the flag is due to a laboratory deviation from a specified protocol or is of technical advisory nature.



A summary of the data verification and validation processes is included in Data Validation Reports prepared by Laboratory Data Consultants, Inc., included as Appendix H and summarized in Section 3.8.

## 2.15 Field Modifications

A total of eight field modifications were implemented in consultation with the USEPA throughout the course of the Phase I Site Characterization Program. The eight modifications included:

- Modification #1 (July 21, 2016) – The incremental soil samples collected from the 0.5 to 2 feet depth intervals as part of the Operational Area soil investigation were not analyzed for VOCs because the compositing and processing of the sample would result in loss of any VOCs, if present.
- Modification #2 (July 22, 2016) – Deep Monitoring Well CFMW-023a was not installed due to bedrock being encountered during drilling at a depth of 148 ft-bls and the presence of existing monitoring well CFMW-023 (located approximately 15 feet from the borehole for CFMW-023a) which is screened from approximately 137.5 to 143.5 ft-bls.

- Modification #3 (July 21, 2016) – Deep Monitoring Well CFMW-016a was constructed with a five-foot screen length from 121 to 126 ft-bls, in lieu of a 10-foot screen length, to ensure ample separation from the shallow monitoring well, CFMW-016, which was installed with a 10-foot screen length from 85 to 95 ft-bls.
- Modification #4 (July 21, 2016) – Field processing of soil samples collected using ISM was discontinued. Instead, the samples (approximately 1-kilogram bulk samples, comprised of 32 aliquots from each DU) were shipped to TestAmerica for processing and preparation in accordance with their SOP for ISM samples.
- Modification #5 (July 21, 2016) – An additional Water Table Monitoring Well, CMFW-056b, was added to the Scope of Work and installed adjacent to Deep Monitoring Well CFMW-056a and Existing Monitoring Well CFMW-056.
- Modification #6 (August 23, 2016) – Seven (7) test pits to 12 ft-bls were completed to evaluate conditions within the Borrow Pit area.
- Modification #7 (August 22, 2016) – Due to the presence of surface water, portions of the South Percolation Pond were inaccessible with the sonic-rotary and/or direct-push drilling rigs; therefore, proposed soil borings CFSB-113 and CFSB-115 were advanced using hand tools.
- Modification #8 (August 30, 2016) – Several surface water and sediment sample locations along the Flathead River were inaccessible by foot due to the presence of forested areas and limited bank/shoreline for traversing; therefore, these sample locations were accessed with the use of a boat.



Modifications were memorialized in Record of Modification forms submitted to the USEPA for approval prior to implementing the change. Executed Record of Modification forms are included as Appendix I.

**2.16 Screening Level Ecological Risk Assessment**

The Phase I Site Characterization Program included the field activities necessary to support of the completion of a Screening Level Ecological Risk Assessment (SLERA) for the Site. In addition to the surface water and sediment sampling activities previously described, Roux Associates and EHS Support personnel performed a detailed Site reconnaissance that included a habitat and biological survey from May 2 to May 5, 2016. During the reconnaissance, Roux Associates personnel observed terrestrial and aquatic habitats at the Site. Observations were documented in field notes and field photographs included as part of the overall Site reconnaissance. The Scope of Work for the (SLERA) was provided in Appendix B of the RI/FS Work Plan. The results of the SLERA will be provided in a separate SLERA Summary Report.

## 3.0 PHASE I SITE CHARACTERIZATION RESULTS

This Section summarizes the results of the Phase I Site Characterization activities.

### 3.1 Historical Records Review

Responses to the FOIA requests were received from USEPA, MDEQ and USACE via letter and/or email correspondence and are included in Appendix J. In the responses from USEPA and MDEQ, Roux Associates was directed to visit the online databases managed by each entity to review any relevant documentation that may be available. No additional documentation pertinent to the Phase I Site Characterization or future RI/FS activities were obtained from these databases that were not already available for review in the project files.

The FOIA request to USACE was sent to the Seattle district office, which responded by instructing Roux Associates to contact the USACE Omaha district office as the managing office that would potentially be in charge of the project. The USACE Omaha district office indicated that no records were found in response to Roux Associates' request.

In addition to the FOIA requests, personnel from Roux Associates continued to review CFACs project files (i.e., those documents provided by CFAC to USEPA in response to the CERCLA 104e information request) and engineering drawings to evaluate if any additional information could be utilized during the Phase I Site Characterization and potentially during future aspects of the RI/FS. No additional changes were made to the Phase I Site Characterization Scope of Work as a result of the records review. The historical records compiled to date will retained as part of the project files and will remain available for further review as appropriate during the course of the RI/FS progresses. Engineering drawings are also available at the Site for review and future use as needed.



### 3.2 Summary of Data Collected During Pre-Intrusive Activities

A summary of the data collected during pre-intrusive activities was provided in the Phase I SAP Addendum. The following section summarizes the findings presented in the SAP Addendum and provides additional evaluation of data where appropriate.

### 3.2.1 Soil Gas Screening

Between April 18, 2016 and April 25, 2016, Roux Associates field personnel completed screening utilizing the soil gas probe method at four locations within the Wet Scrubber Sludge Pond and two locations within the Center Landfill. Roux Associates personnel also screened ten existing landfill vents present in the West Landfill. On June 4, 2016 and June 5, 2016, Roux Associates utilized a Geoprobe direct push rig operated by Cascade to complete the collection of soil gas samples for screening within the West, Sanitary, and Industrial Landfills. Field data sheets with the soil gas screening results are provided in Appendix C.

The soil gas screening results are summarized in Table 6 and shown on Figure 4. The results indicated only one, low level detection of methane (0.1 % LEL) at location CFGS-041, which is a landfill vent located within the West Landfill. The results indicated PID detections of VOCs at 9 out of 30 locations. However, only one detection of VOCs was above 1.0 ppm, which was 4.9 ppm at location CFGS-014 in the Center Landfill.



### 3.2.2 Passive Soil Gas Sampling

Amplified Geochemical Imaging, LLC (AGI) passive sampling devices were installed in eight locations within the Former Drum Storage Area and two locations within the former Operational Area (at a former storage area) as shown on Figure 5.

The ten passive samples, and one duplicate sample, were analyzed by AGI for VOCs according to a modified USEPA 8260 analytical method. Results were reported by AGI for mass adsorbed to the passive sampler in micrograms (µg). Results are provided in Table 7 and shown on Figure 5. Results indicate:

- One or more VOC compounds were detected in all ten passive samplers, with benzene and tetrachloroethene (PCE) being the most frequently detected VOCs;
- Benzene was detected in 5 of the 10 locations with mass adsorbed ranging from 0.02 to 0.21 micrograms (µg); and
- Tetrachloroethene (PCE) was detected in 4 of the 10 locations with mass adsorbed ranging from 0.07 to 2.3 µg.

The benzene detections were spatially dispersed across the sampling area. The PCE detections were all located within the southeastern half of the Former Drum Storage Area. It should be noted that the AGI results are total mass results; not concentrations. Therefore, these results are not appropriate for comparison to soil gas screening criteria; but rather, to identify areas where additional investigation for VOCs in soil, groundwater and/or soil gas may be warranted.

Based on the initial screening data, the SAP Addendum noted that VOCs required additional investigation within the Former Drum Storage Area and in the Operational Area. A description of the investigation activities proposed in these areas was provided in Section 3.2 of the SAP Addendum (Roux Associates, 2016a). In the Former Drum Storage Area, the additional work included one additional water table monitoring well (Monitoring well ID CFMW-002) added to the drilling Scope of Work near soil gas location CFSGP-030, where results indicated the highest mass value of PCE. In the Operational Area, the additional work included relocating the closest proposed monitoring well (CFMW-022) to be placed in the location where the AGI sample with VOCs detections was located (CFSGP-016). The VOC results in soil and groundwater at these locations are summarized in the soil and groundwater quality sections of this Data Summary Report (Sections 3.4 and 3.5, respectively).



### 3.2.3 Geophysical Survey

This section describes the geophysical survey data that was collected at the Site during the Phase I Site Characterization.

#### 3.2.3.1 ER/IP Survey

The results of the ER/IP geophysical survey were presented by Spectrum Geophysics in a standalone summary report submitted to Roux Associates dated July 21, 2016, and titled “Report of Geophysical Investigation”. The purpose of the summary report was to present the scope of work, field methods, results, and an interpretation of the results of the electrical resistivity (ER) / induced polarization (IP) geophysical survey. The report is included with this Data Summary Report as Appendix B.

Six linear transects (Figure 3) were completed in various parts of the Site as part of the ER/IP geophysical survey. 2D images of subsurface materials along each transect were included in the summary report, along with an interpretation of the six linear transects by Spectrum Geophysics. The results and interpretation of the geophysical data were compared with observations made by

Roux Associate's personnel during the Phase I drilling activities. A brief summary of the findings presented by Spectrum Geophysics is provided below:

- Soil lithologic changes and depth to groundwater table observations made as part of the geophysical survey were generally consistent with observations made by Roux Associates personnel during the Phase I Site Characterization drilling;
- Bedrock was interpreted by Spectrum Geophysics to be observed in the eastern ends of transect lines, 3, 5, and 6 (along the flank of Teakettle Mountain) at varying depths ranging from 148 to 200 ft–bls, while no bedrock was observed in the central and western portions of these transects; nor in transects 1, 2 and 4;
- Depth of waste material within the East Landfill was estimated to be approximately 40 feet below the top of the landfill in transect line 3;
- Depth of waste material within the Wet Scrubber Sludge Pond was estimated to range ranges in thickness from 15 to 43 feet thick in transect line 5;
- An area of low resistivity was identified to approximately 50 feet below the top of the Center Landfill in transect line 5, suggesting the depth of the waste material could be as thick as 50 feet or an area of impacted soil or groundwater could be underlying the Center Landfill; and
- An area of low resistivity was identified to approximately 106 feet below the top of the West Landfill in transect 6, suggesting the depth of the waste material could be as thick as 106 feet or an area of impacted soil or groundwater could be underlying the West Landfill.



#### 3.2.3.2 Landfill GPR Survey

The results of the landfill GPR survey were presented by Shari A. Johnson Engineering in a summary report submitted to Roux Associates dated August 12, 2016 and titled "Ground Penetration Radar Survey – Landfill Summary Report". The purpose of the summary report was to present the scope of work, field methods, results, and an interpretation of the results of the GPR survey. The report is included as part of this Data Summary Report as Appendix E.

Ten linear transects (Figure 6) were completed across the landfill areas as part of the GPR survey. 2D images of the readings collected along each transect were included in the summary report, along with a limited interpretation of the transects by Shari A. Johnson Engineering. A brief summary of the findings presented by Shari A. Johnson Engineering is provided below:

- Transects across the East Landfill showed a strong GPR signal layer around 2 ft-bls, with little to no signal below the layer. This signal layer is interpreted as a reflection of the engineered landfill cap that is present at the East Landfill based on historical documents.

- A consistent horizontal signal layer was observed at approximately 1 ½ to 2 ft-bls across the majority of the West Landfill, with an intermittent, less defined horizontal signal approximately 1 foot below the upper signal. These signals are interpreted as a reflection of the engineered landfill cap that is present at the West Landfill based on historical documents.

- The Wet Scrubber Sludge Pond, Sanitary Landfill, and Center Landfill did not have any clear signals observed with the GPR technology.

### 3.3 Geology and Hydrogeology

This Section describes the Site geology observed during the Phase I Site Characterization and discusses the influence that Site geology has on hydrogeologic conditions in the subsurface beneath the Site.

#### 3.3.1 Site Stratigraphy

A summary of regional and Site geology was provided in Section 2.4 of the RI/FS Work Plan based on previous investigations at the Site and published literature for the Kalispell Valley region. One of the objectives of the Phase I Site Characterization drilling program was to refine the understanding of local Site geology and evaluate the influence of local geology and Site features on groundwater flow and potential COPC fate and transport.



Lithology collected from soil borings completed during the Phase I Site Characterization were utilized to prepare four generalized hydrogeologic cross-sections depicting the stratigraphy beneath the Site, as shown on Plate 6 and including:

- Section A-A' (Plate 7) oriented south-west to north-east and perpendicular to Teakettle Mountain, extending from the western boundary of the Site across the West Landfill;

- Section B-B’ (Plate 8) oriented west to east across the southern portion of the Site, extending from the western boundary of the Site to the eastern boundary of the Site;

- Section C-C’ (Plate 9) oriented north-west to south-east and parallel to Teakettle Mountain, extending from the western side of the Industrial Landfill to the Flathead River; and

- Section D-D’ (Plate 10) oriented west to east, extending across the Former Drum Storage Area, Wet Scrubber Sludge Pond, and the East Landfill.

In general, the geologic cross sections indicate that three major stratigraphic units underlying the Site were observed. The three stratigraphic units consist primarily, from land surface down, of:

- A layer of glaciofluvial and alluvial coarse grained soils, varying in vertical extent and grain size depending on vicinity to Site features (i.e., Teakettle Mountain, Flathead River, etc.);
- A layer of dense, poorly sorted glacial till with interbedded deposits of glaciolacustrine clays and silts; and
- Bedrock.

A description of the three stratigraphic units observed on the cross sections is provided in the following sections. It is important to note that the hydrogeologic cross sections form a general depiction of the conditions in the subsurface of the Site interpreted over large areas. Therefore, the localized geologic conditions between the drilling locations may be significantly more heterogeneous than depicted on the sections.



#### 3.3.1.1 Glacial Outwash and Alluvium

The glacial outwash and alluvium layer typically contains coarse grained soils (varying amounts of sand, gravel, and cobbles) with varying degrees of sorting and with lesser amounts of fines. The glacial outwash layer is encountered at the surface across most of the site, with recent alluvial deposits present primarily near the southern border of the Site in the vicinity of the Flathead River.

The cross sections indicate that the glacial outwash vertical thickness appears to be relatively consistent in areas north and west of the Main Plant Area, with average thicknesses ranging from 50 to 80 feet thick as shown on Sections C-C’ (Plate 9) and A-A’ (Plate 7). The glacial outwash north of the Main Plant Area reaches maximum vertical thickness in the areas beneath the Former Drum Storage Area, West Landfill, Wet Scrubber Sludge Pond and Center Landfill; where thickness was typically observed to range from 125 to 150 feet as shown on Section D-D’ (Plate 10). The thickness tends to decreases close to Teakettle Mountain where bedrock elevations are shallower (see Section 3.3.1.2) as shown on Section A-A’ (Plate 7).

Near the Flathead River, the vertical extent of the alluvial deposits is approximately 100 feet thick (Section B-B’, Plate 8) along the western/central southern boundary of the river. The thickness of the alluvial deposits near the river is greatest to the area south east of the Main Plant Area, near former production wells PW-4 and PW-5, where thicknesses of greater than 150 feet were observed in Section B-B' (Plate 8).

#### 3.3.1.2 Glacial Till

Glacial till was observed in the subsurface across most of the Site, typically beneath the coarse grained outwash deposits. The glacial till layer is a dense, poorly-sorted deposit, consisting of varying amounts of sand, gravel, cobbles, silt and clay. The till was typically noted to be drier and denser than the overlying coarse grained deposits.

The maximum vertical extent of the glacial till is unknown in the areas to the north, west, and south of the Site, as the next lithologic layer was not encountered during drilling. This indicates that the till is typically at least 200 feet thick or greater in these areas. The till layer is shown as thinning out in the eastern parts of sections A-A' (Plate 7) and D-D' (Plate 10) near Teakettle Mountain.



The glacial till unit was observed to have pockets of wet, coarse grained soils interbedded in the till layer and also interbedded layers of primarily silt or primarily clay. The interbedded layers are generally not continuous and can be found scattered throughout the till layer. These interbedded layers form complex, heterogeneous conditions that likely result in interbedded zones of high and low hydraulic conductivities, which influence the overall deep groundwater flow system for the Site (See Section 3.3.2 below).

#### 3.3.1.3 Bedrock

Based on regional geologic literature, beneath the unconsolidated glacial deposits are pre-Cambrian aged bedrock. The literature indicates that the depth to bedrock increases in a southwestern direction across the Site, as you move away from Teakettle Mountain. This was confirmed during the Phase I Site Characterization. Bedrock was encountered in soil boring CFMW-023a, which is located to the east of the Site near Teakettle Mountain, at approximate depths of 150 ft-bls. Weathered bedrock was also encountered in soil boring CFMW-008a (also located to the east of the Site near Teakettle Mountain) at approximately 130 ft-bls, and a more competent bedrock within the same boring at approximately 245 ft-bls. Bedrock was not encountered in any of the other deep soil borings completed at the Site, indicating that depth to bedrock is greater than 300 ft-bls across most of the Site.

### 3.3.2 Hydrogeology

The stratigraphic units underlying the Site form a complex hydrogeologic framework that influences groundwater elevations, groundwater flow and potential COPC migration beneath the Site.

The coarse grained glacial outwash and alluvium deposits that are found above the glacial till will collectively be referred to as the "upper hydrogeologic unit" at the Site. As described in Section 3.3.2.1, the groundwater within this unit appears to exist under perched water-table conditions. Perched zones occur at various locations throughout the Kalispell Valley and have historically been referred to in regional literature as the Pleistocene perched aquifers (Konizeski et al., 1968). During drilling, the glacial deposits comprising the upper hydrogeologic unit were typically observed to be loose and wet when water was encountered at the water table.



Based upon relatively consistent elevations at which groundwater was encountered within the upper hydrogeologic unit, and the occurrence of groundwater at all drilling locations, it appears that the unit is horizontally continuous across the investigated area. The saturated thickness of the upper hydrogeologic unit varies across the Site depending upon the depth to underlying glacial till and proximity to Teakettle Mountain. Saturated thickness was observed to be less near Teakettle Mountain, when compared to areas beneath the landfills and west of the landfills. This was confirmed during monitoring well gauging (See section 3.3.2.1 below), when it was observed that some of the wells near Teakettle Mountain became dry in late summer/early fall due to seasonal fluctuation in groundwater levels.

As indicated on the geologic logs (Appendix D), during drilling the glacial tills found below the upper hydrogeologic unit were typically characterized as containing a higher percentage of fines, and as denser and drier, than the overlying outwash and alluvium deposits. The till deposits were often characterized as stiff and, moist or dry; as overlying outwash and alluvium that was typically characterized as loose and wet. These observations indicate that the till deposits likely have a lower hydraulic conductivity than the overlying outwash and alluvium deposits. This is supported by observations during monitoring well development as recorded on the field data sheets included in Appendix C, where the new, deep wells screened within the tills typically yielded much less water than water table wells screened in the outwash deposits.

As described in Section 3.3.1.2, interbedded layers of coarse grained soils were observed throughout the glacial till, as shown on Sections A-A' and D-D' along Teakettle Mountain. These interbedded layers do not form continuous hydrogeologic units. Deep monitoring wells were installed within these coarse materials to evaluate the presence of COPCs in groundwater in these coarse materials. Results of deep groundwater samples are discussed in Section 3.5.

Based upon the conceptual Site model, bedrock is considered to define the bottom of the hydrogeologic system beneath the Site. As noted above in Section 3.3.1.3, the borehole for CFMW-008a was advanced approximately 115 feet into weathered bedrock. The cuttings throughout this sequence were characterized as dry or moist, with no indications of any water bearing zone.



#### 3.3.2.1 Groundwater Elevations/Potentiometric Surfaces and Flow Patterns

Sixty-four monitoring wells (44 new and 20 existing) were visited on August 30, 2016 and November 29, 2016 to measure depth to groundwater across the Site. Depth to groundwater and potentiometric surface elevations from the two gauging events are provided in Table 3. During the August gauging event, three monitoring wells were observed to be dry (CFMW-017, CFMW-018, and CFMW-025). During the November gauging event, two wells were observed to be dry (CFMW-018 and CFMW-042) and one well had less than 0.5 feet of water in the well (CFMW-025).

The groundwater elevations from monitoring wells screened in the upper hydrogeologic unit were utilized to create groundwater contour maps and to evaluate groundwater flow within the perched zone. As shown in Plates 11 and 12, overall groundwater flow across the Site in the upper hydrogeologic unit is generally to the South / Southwest direction towards the Flathead River. While the southerly flow direction is consistent across the Site, the discussion of the hydraulic gradient can be divided into three distinct areas. Near Teakettle Mountain and in the landfill area of the Site, the groundwater hydraulic gradient is steep (approximately 0.059 ft/ft) and generally mirrors the steeper topography in that portion of the Site. Groundwater elevations in the center of the Site (near the North Percolation Ponds, former Operational Area, and northern half of the Main Plant Area) are consistent over long distances (typically within 1 foot over distances greater than 1,000 feet), indicating a relatively flat groundwater hydraulic gradient (approximately 0.0045 ft/ft) across the center of the Site. The gradient then increases in the southern area of the Site between the Main Plant Area and the Flathead River (approximately 0.031 ft/ft), which is also consistent with the steep drop in topography between the Railroad and the River. The gradients above, and the elevations measured in the Flathead River generally indicate groundwater in the upper hydrogeologic unit appear to discharge to the Flathead River. This is also consistent with observations at the Site where groundwater is observed to discharge from the upper hydrogeologic unit to surface water in the Backwater Seep Sampling Area.



Two data gaps were identified during preparation of the water table groundwater flow map; resulting in the need to infer groundwater elevations in certain areas. The first data gap is related to the area northwest of the Industrial Landfill in the northern most area of the Site. Review of the topography indicates that the Industrial Landfill is a localized high point within that portion of the Site. The topography to the northwest of the landfill indicates that land surface slopes down towards Cedar Creek. No monitoring wells were installed in this area of the Site, and therefore contours were inferred based on the nearest wells and the existing topographic map for the Site. The second data gap is related to the area near the southwestern border of the Site. A new, deep monitoring well was installed in this area (CFMW-057a) as part of the Phase I Site Characterization. No monitoring well was installed immediately below the water table (within the upper hydrogeologic unit) because the intent was to use the existing monitoring well CFMW-057 as the water table well. However, as shown on Cross Section C-C' (Plate 9), it was determined that the screened depth of the existing well is within the glacial till, and therefore is not representative of water table conditions in this area. As a result, the water-table contours shown on Plates 11 and 12 were inferred in this area based on the nearest wells.

The potentiometric surfaces measured in August and November 2016 within the deep wells that are screened in the glacial till unit are also provided on Plates 11 and 12 for comparison with elevations measured in wells screened in the upper hydrogeologic unit. In addition, the table below shows the elevations measured in monitoring well clusters, where there is a well screened within the upper hydrogeologic unit and an adjacent deep well screened below the upper hydrogeologic unit.

| Monitoring Well Location ID | Geologic Unit | Aug 30, 2016 GWE (Ft-Amsl) | Nov 29, 2016 GWE (Ft-Amsl) |
|---|---|---|---|
| CFMW-003 | Upper | 3121.48 | 3122.83 |
| CFMW-003a | Below Upper | 2994.17 | 2996.23 |
| CFMW-011 | Upper | 3064.99 | 3063.39 |
| CFMW-011a | Below Upper | 3003.10 | 3003.78 |
| CFMW-012 | Upper | 3066.78 | 3065.42 |
| CFMW-012a | Below Upper | 2997.42 | 2999.05 |
| CFMW-019 | Upper | 3064.43 | 3062.7 |
| CFMW-019a | Below Upper | 2997.48 | 2999.07 |
| CFMW-025 | Upper | DRY | 3077.09 |
| CFMW-025b | Upper | 3068.84 | 3069.73 |
| CFMW-025a | Below Upper | 3055.65 | 3047.51 |
| CFMW-032 | Upper | 3064.59 | 3062.48 |
| CFMW-032a | Below Upper | 3003.59 | 3004.67 |
| CFMW-044 | Upper | 3060.02 | 3056.41 |
| CFMW-044a | Upper | 3056.40 | 3052.88 |
| CFMW-044b | Below Upper | 3044.03 | 3051.38 |
| CFMW-053 | Upper | 3052.45 | 3038.58 |
| CFMW-053a | Below Upper | 3023.76 | 3021.97 |
| CFMW-056b | Upper | 3067.50 | 3065.93 |
| CFMW-056a | Below Upper | 3021.119 | 3022.38 |
| CFMW-056 | Below Upper | 3014.79 | 3015.92 |



As shown above, in all cases the elevations measured in deep wells screened within the till are lower than the elevations in adjacent wells screened within the upper hydrogeologic unit. The difference in measured elevations between the two layers indicates a downward vertical gradient exists. However, the differences in elevations between the glacial till and the upper hydrogeologic unit is typically greater than 25 ft, and in some cases exceed 50 ft. This large difference is also indicative of limited (if any) hydraulic connectivity between the two water bearing zones.

The elevations in the wells within the glacial till were also observed to be highly variable from well to well. For example, wells near the Flathead River and those near the landfill area varied by as much as 50 feet. The elevation of groundwater within the wells screened in the till depend on location of the well and the type of material that the well is screened (i.e., lower permeability tills versus pockets of coarser material occasionally observed within the till). The drilling program targeted installation of the deeper wells within the identifiable water bearing zones within the till unit. However, the observed till lithology and limited yield of several deep wells during the well development process still indicates a relatively low hydraulic conductivity with these zones. Based on the highly heterogeneous conditions, variable water levels, and the limited presence of COPCs in deep groundwater observed during groundwater sampling (See Section 3.5.2), the groundwater elevations measured in wells screened in the glacial till were not contoured.



#### 3.3.2.2 Long Term Trends from Pressure Transducer Data

Six (6) In-Situ LevelTroll 700 pressure transducers were deployed at the Site in April 2016 to continuously collect groundwater elevation data. The objective of the data collection was to develop an understanding of groundwater elevation fluctuations in response to short term precipitation events as well as in response to longer term seasonal trends at the Site. Pressure transducer data were downloaded multiple times throughout the field activities, typically coinciding with monitoring well gauging activities. Hydrographs for each location displaying groundwater elevation over time and precipitation from Glacier National Park Airport (Kalispell, MT) are provided in Appendix K. In addition to the data collected with the six deployed transducers, Roux Associates also reviewed data collected by the Montana State Bureau of Mines from a pressure transducer that was deployed in existing monitoring well CFMW-007/TW-3 (identified as well ID 87873 in the Montana State Bureau of Mines Website database.

Review of the transducer data indicates that the highest Site water levels were observed in Late May/early June and the lowest water levels were observed in Late October/early November. The magnitude of groundwater elevation fluctuations was dependent on the location within the Site and the well screen depth. The largest fluctuations were observed in monitoring wells screened in the upper hydrogeologic unit and located near Teakettle Mountain, including CFMW-007 (>40 feet) and CFMW-020 (>30 feet). Review of the elevation data compared to precipitation records suggest that the water table elevations may fluctuate significantly over short periods of time (> 20 feet over 1 month) as a result of precipitation events and from contributions of losing streams, as discussed in Section 3.3.2.3. Smaller fluctuations were observed in wells located in the northern areas of the Site, including CFMW-001 (approximately 2 feet), and also wells screened below the upper hydrogeologic unit, including CFMW-044b (approximately 8 feet). The fluctuations in these wells are gradual and do not correlate with the short-term precipitation events. Pressure transducers will continue to be utilized long term at the Site to evaluate seasonal groundwater elevations. Data will be downloaded during future monitoring well gauging events.



#### 3.3.2.3 Surface Water Elevations

The elevations of the stream bed of Cedar Creek and Cedar Creek Drainage Overflow Ditch were measured at multiple locations as part of the surveying activities completed at the Site and are shown on Plates 11 and 12. The elevations of the two surface water bodies are important to understanding if the feature loses or gains water from the surrounding groundwater flow system.

The Cedar Creek Drainage Overflow Ditch is present at elevations above the groundwater elevations measured in monitoring wells on either side of the feature. This indicates that surface water, when present within the Overflow Ditch, is likely infiltrating into the subsurface through the stream bed. Thus, the Cedar Creek Drainage Overflow Ditch likely contributes to recharge of the groundwater flow system. This water likely flows south /south-west based on the gradient and flow directions shown on the groundwater flow maps.

The elevations measured in the north end of Cedar Creek and the south end of Cedar Creek indicate the creek bed is at elevations higher than groundwater elevations measured in the western most monitoring wells closest to the Creek. Similar to the Cedar Creek Drainage Overflow Ditch, this indicates the water flowing in Cedar Creek has potential to infiltrate through the creek bed and thereby serve as source of recharge to the groundwater system. Conversely, these data also indicate that groundwater beneath the Site is not discharging to Cedar Creek.

Elevations of the Flathead River measured from the staff gauge are similar to the closest upgradient monitoring wells located on the boundary of the South Percolation Ponds. Groundwater elevations within upgradient Site monitoring wells screened in the upper hydrogeologic unit are higher than those measured in the Flathead River, and indicate an overall hydraulic gradient toward the River. These findings indicate the groundwater in the upper hydrogeologic unit likely discharges at the Flathead River; which is consistent with the observations of groundwater seeps along bank of the River.

#### 3.3.2.4 Surface Water Discharge Data

Discharge of Cedar Creek and Cedar Creek Drainage Overflow Ditch were measured utilizing a mechanical current-meter method as described in Section 2.11.4. Results of the discharge calculations are summarized in the table below. It should be noted that water was not observed to be present in the Cedar Creek Drainage Overflow Ditch throughout most of the field program. Discharge in the ditch was measured on June 7, 2016 when water was observed to be present and surface water sampling was also conducted in tandem. Discharge in Cedar Creek was measured immediately prior to the surface water sampling event in September 2016.



| Location ID | Date Measured | Feature | Discharge ($ft^3/s$) |
|---|---|---|---|
| CFSWP-013 | 6/7/2016 | Cedar Creek Drainage Overflow Ditch | 16.88 |
| CFSWP-012 | 6/7/2016 | Cedar Creek Drainage Overflow Ditch | 13.97 |
| CFSWP-011 | 6/7/2016 | Cedar Creek Drainage Overflow Ditch | 15.09 |
| CFSWP-010 | 6/7/2016 | Cedar Creek Drainage Overflow Ditch | 11.26 |
| CFSWP-009 | 6/7/2016 | Cedar Creek Drainage Overflow Ditch | 2.45 |
| CFSWP-014 | 8/30/2016 | Cedar Creek | 7.09 |
| CFSWP-015 | 8/29/2016 | Cedar Creek | 4.52 |
| CFSWP-016 | 8/29/2016 | Cedar Creek | 5.87 |

The discharge was evaluated at multiple points along the surface water bodies to confirm if each surface water body was acting as a losing stream as it flowed throughout the Site. In both Cedar Creek and Cedar Creek Drainage Overflow Ditch, the discharge measured at locations on the north end of the Site were higher than the locations at the south parts of the Site. These data indicate that both surface water bodies were acting as losing streams and thus water passing through the stream channel is likely infiltrating into the groundwater system. These data are also supported by visual field observations throughout the program where the north end of the Cedar Creek Drainage Overflow Ditch was observed to be wet, while the south end of the ditch was dry at the same time. As described in Section 3.3.2.3, comparison of the streambed elevations with the groundwater elevations also indicates that both Cedar Creek and the Overflow Ditch act as losing streams. In both features, there were also small increases in discharge measured in the middle of the features, which may be attributed to local surface water inputs and/or within the margin of measurement error.

Due to the size and flow of the Flathead River, discharge could not be collected utilizing the mechanical flow meter method. A temporary staff gauge was installed within the Flathead River to enable measurement of river level conditions immediately adjacent to the Site. The temporary staff gauge was surveyed as part of monitoring well surveying activities with the intent of potentially correlating the measurements to the nearest USGS gauging station (Station No. 12363000) located down river of the Site. The correlation will be performed as data is collected throughout the RI/FS. As part of the Phase I Site Characterization, data was reviewed from the USGS station to understand the general conditions of the Flathead River. The data indicates that daily mean discharge of the Flathead River in 2016 peaked on April 24, 2016, with a value of 28,900 cubic feet per second (cfs). The lowest observed daily mean discharge was 3,430 cfs on January 19, 2016. During the gauging events on August 30, 2016 and November 29, 2016, the daily mean discharge was 3,730 cfs and 7,970 cfs respectively.



## 3.4 Soil Quality

The following sections provides a summary of soil quality based on evaluation of the laboratory analytical data that were generated during the Phase I Site Characterization. Data summary tables containing all of the soil data generated during the work are provided in Appendix L. Additionally, laboratory data reports were provided to the USEPA as separate submittals throughout the work. Electronic Data Deliverables (EDDs) with the soil data were also provided online for download by the USEPA from the CFAC RI/FS project database.

Throughout the remainder of this Data Summary Report, analytical results are compared to the various screening criteria in accordance with the RI/FS Work Plan. All comparisons of analytical results to screening criteria are provided to enable better understanding of the relative concentrations of the various analytes. The presence of analytes in media at concentrations exceeding screening criteria does not indicate that a risk exists, but rather, that further evaluation of that particular analyte and exposure scenario may be warranted during the risk assessment phase of the RI/FS.

### 3.4.1 Overview of Site-Wide Soil Quality

Site-wide analytical soil data from samples collected at discrete sampling locations were evaluated to determine the presence, or lack thereof, of COPCs in soil. Data summary tables containing all of the Site-wide soil sampling data during the work are provided in Appendix L, Tables L1 through L7.



Tables 8 through 10 provide a statistical summary of the analytical results for surface soil (0-0.5 ft-bls), shallow soil (0.5-2 ft-bls), and intermediate soil (typically 10-12 ft-bls) respectively. These tables identify the frequency of detection; as well as the minimum, maximum and average detected concentrations, of each analyte in soil for the respective depth interval. In addition, the statistical summary tables provide the frequency that the measured concentration of each analyte in soil exceeded the following human health screening criteria as noted in the RI/FS Work Plan and SAP:

- USEPA Residential Regional Screening Levels (May 2016);
- USEPA Industrial Regional Screening Levels (May 2016); and
- USEPA Protection of Groundwater Risk Based Soil Screening Levels (May 2016).

Evaluation of the soil data with respect to ecological screening criteria is provided within the SLERA Summary Report being submitted under separate cover. In addition, discussion of results from background sampling locations is provided in Section 3.4.4.

All comparisons of analytical results to screening criteria are provided to enable better understanding of the relative concentrations of the various analytes. The screening criteria are developed by USEPA using conservative assumptions. The presence of analytes in soil at concentrations exceeding screening criteria does not indicate that a risk exists or that remedial action is required, but rather, that further evaluation of that particular analyte and exposure scenario may be warranted during the risk assessment phase of the RI/FS.

The evaluation of the statistical summary of soil data presented in Tables 8 through 10 indicates the following about the Site-wide soil conditions:

- Cyanide was detected in greater than 78 percent (%) of all soil samples. The detected concentrations exceeded the USEPA Industrial RSL of 15 mg/kg in less than one percent of all soil samples and exceeded the USEPA Residential RSL of 2.3 mg/kg in less than three percent of all soil samples.

- Fluoride was detected in greater than 99% of all soil samples. Fluoride concentrations did not exceed the USEPA Industrial RSL of 4,700 mg/kg in any soil samples. The detected concentrations exceeded USEPA Residential RSL of 310 mg/kg in less than one percent of all soil samples.

- SVOCs (primarily PAHs) were detected frequently across the Site. PAHs were most frequently detected in surface soil samples, with one or more PAHs detected in greater than 90 percent of the surface samples. The frequency of detection decreases with depth such that PAHs were detected in less than 52 percent of the intermediate depth samples. PAHs were detected at concentrations that exceeded both the USEPA Residential RSLs and Industrial RSLs at multiple locations across the Site and at all three depth intervals.

- Metals were detected frequently across the Site. Sixteen different metals were detected at frequencies between 90 and 100 percent of the samples collected, which is indicative of metals as naturally occurring substances in the environment. Exceedances of USEPA Residential RSLs were observed for several metals. However, exceedances of USEPA Industrials RSLs for metals were limited (i.e., less than two percent of all samples), with the exception of arsenic which exceeded the Industrial RSL of 3 mg/kg in approximately 84% of all samples collected. [Note: As further discussed in Section 3.4.4.4, arsenic commonly exceeds the Industrial RSL in soils throughout Montana.]

- VOCs were detected across the Site, typically at trace, low part per billion concentrations; with 23 different VOC analytes detected across all sampling depth intervals. The most common VOCs detected were acetone, benzene, toluene and xylenes; with the frequency of detection of these four compounds at the various depth intervals ranging from approximately 62 percent to 95 percent. Despite the frequency of VOCs detected, there were no VOCs with measured concentrations exceeding USEPA Residential or Industrial RSLs, including at the areas within the Former Drum Storage Area and Operational Area where VOCs were detected in passive soil gas samples (Section 3.2.2).

- PCBs and pesticides were not detected in any of the discrete soil samples collected during the Phase I Site Characterization.

In addition to the comparisons to USEPA Industrial and Residential Screening levels described above, the soil analytical data were compared to the USEPA Protection of Groundwater Risk Based Soil Screening Levels (USEPA RSSLs). A statistical summary of the analytical data is also provided in Tables 8 through 10 for each analyte. The results indicate that several PAHs and metals, and some VOCs, were observed in all soil sampling intervals at concentrations that frequently exceed the USEPA RSSLs. However, it should be noted that the USEPA RSSLs are so low, due to the inherently conservative methodology used to develop the criteria, such that for many analytes any detection results in an exceedance. Therefore, the results from the soil sampling will also be evaluated in tandem with the groundwater sampling analytical data collected across the Site-wide groundwater monitoring network to evaluate whether and to what extent constituents detected in soil are impacting Site-wide groundwater quality. The groundwater quality data is presented in Section 3.5.



Maps depicting the relative concentrations of cyanide, fluoride, and selected PAHs and metals in soil across the Site are provided in Appendix N. These maps are thematic maps (i.e., color coded dot maps) that facilitate the identification of locations where the analyte was detected, the locations where analyte concentrations exceed the USEPA Residential and Industrial RSLs, and the relative magnitude of the exceedances. The selected PAHs and metals shown on the maps are those that were most frequently detected at concentrations exceeding their respective RSLs. The sections below provide additional detail regarding the analytes detected within Site-wide soil samples.

#### 3.4.1.1 Site-Wide Cyanide and Fluoride

The distribution of cyanide and fluoride is shown on Appendix N, Plate N1. These data indicate the following:

- Cyanide was detected within 93% of surface samples, 87% of shallow samples, 56% of intermediate samples, and 66% of the below water table samples. Although cyanide was detected widespread across the Site, cyanide concentrations are below the USEPA Industrial RSL of 15 mg/kg in all samples with the exception of four samples collected from within the North-East Percolation Pond (one surface, two shallow, and one intermediate). Cyanide concentrations are below the USEPA Residential RSL of 2.3 mg/kg in all samples with the exception of eight samples collected within the North-East and North-West Percolation Pond and two samples beneath the former cathode soaking pit location within the Main Plant Area.

- Fluoride was detected within 100% of surface and shallow samples, 98% of intermediate samples, and 100% of the below water table samples. Although fluoride was detected widespread across the Site, no fluoride concentrations were above the USEPA Industrial RSL of 4,700 mg/kg. Only four samples exceeded the USEPA Residential RSL of 310 mg/kg for fluoride, all of which were collected within the first 2 ft-bls from within the Rod Mill, eastern Main Plant Area, and Paste Plant.

#### 3.4.1.2 Site-Wide PAHs

PAHs that were most frequently detected in soil at concentrations exceeding USEPA RSLs are shown in Appendix N, Plates N2 through N4. The PAH data collected from Site-wide soils during the Phase I Site Characterization indicate the following:

- PAHs that were most frequently detected above USEPA Industrial RSLs include benzo[a]pyrene, benzo[a]anthracene, benzo[b]fluoranthene, and indeno[1,2,3-cd]pyrene.

- The frequency and magnitude of exceedances decrease with increasing depth; however, exceedances of all three screening levels were observed within the deepest samples (10-12 ft-bls) around the Main Plant Area.

- Samples around the Main Plant Area and North Percolation Ponds typically exceed the USEPA Industrial RSLs, with the highest magnitude of exceedances within the surface sampling interval.

- PAHs are typically not detected or detected at concentrations less than USEPA Residential RSLs along the western boundary and northwest portion of the site.



#### 3.4.1.3 Site-Wide Metals

Metals that were most frequently detected in soil at concentrations exceeding USEPA RSLs are shown in Appendix N, Plates N5 through N7. The metals data collected during the Phase I Site Characterization indicate the following:

- Thirteen different metals were detected in all Site-wide soil samples collected during the Phase I Site Characterization.

- The areal distribution of the detected metals is widespread across the Site and in general the concentrations appear similar across the three sampling intervals.

- Arsenic was detected at concentrations exceeding the USEPA Industrial RSL of 3 mg/kg in approximately 84% of all samples collected. [Note: As further discussed in Section 3.4.4.4, arsenic commonly exceeds the Industrial RSL in soils throughout Montana.] The only other metals that were detected at concentrations above USEPA Industrial RSLs include thallium (five samples located within the North-East Percolation Pond and Influent Ditch), aluminum (only one sample), and copper (only one sample).

- Aluminum, arsenic, cobalt, iron, and manganese were detected at concentrations exceeding USEPA Residential RSLs in more than 70% of all samples collected.
- Lead did not exceed the USEPA Residential RSL of 400 mg/kg in any of the samples collected in any of the depth intervals, including within samples that were sieved to assess the fine fraction of lead, as discussed in Section 3.4.1.5.

It should be noted that all of the metals detected can be found as naturally occurring substances in the environment. Therefore, further evaluation and discussion of the metals concentrations relative to background concentrations is provided in Section 3.4.4.4.

#### 3.4.1.4 Dioxins (PCDDs) and Dibenzofurans (PCDFs)

Soil samples collected within the Rectifier Yards were analyzed for dibenzo-p-dioxins (PCDDs) and polychlorinated dibenzofurans (PCDFs). PCDDs and PCDFs are by-products that can occur when PCB fluid is partially burned; but also can be by-products produced during forest fires as well. Chemicals like PCBs differ in the number and location of chlorine atoms, and act like dioxins, based on their level of toxicity. These chemicals are known as dioxin-like compounds (DCLs). DCL toxicity is measured in relation to 2,3,7,8-tetrachlorodibenzodioxin (TDCC), the most potent dioxin. Since there are numerous derivative compounds of dioxins, each individual compound is assigned a Toxicity Equivalency Factors (TEFs) on the basis of how toxic they are in comparison with the toxicity of TDCC. TDCC has a TEF of 1.0, and is used for comparison as the index chemical to the DLCs. For example, 1,2,3,4,7,8- hexachloro-dibenzo-p-dioxin is considered one tenth as toxic as TCDD and has therefore been given a TEF of 0.1.



To apply TEFs to the Phase I Site Characterization data for comparison, the USEPA screening levels for each DLC was multiplied by its corresponding TEF value, using TCDD as the index chemical. Appendix L, Table L7 provides the analytical results compared to the calculated DLC-specific USEPA screening levels and also provides the various dioxin-like TEFs used for comparison, based on the table provided in the USEPA report, "*Recommended Toxicity Equivalence Factors (TEFs) for Human Health Risk Assessments of 2,3,7,8-Tetrachlorodibenzo-p-dioxin and Dioxin-Like Compounds*" (USEPA, 2010b). A comparison of these data indicate the following:

- All individual DLC concentrations for detected samples were below their respective USEPA Residential and Industrial RSLs.

- TCDD was detected in less than 11% of the samples. Detections of TCDD included four samples within the Rectifier Yards, three of which were surface soil samples. The sample concentrations did not exceed the calculated USEPA Residential or Industrial RSLs at any sampling interval.

#### 3.4.1.5 Comparison of Bulk and Sieved Lead Soil Data

In accordance with MDEQ procedures for evaluating lead in soil, surface soil (0 – 0.5 ft-bls) was collected from 36 sampling locations (more than 20% of the sample locations) and was analyzed for lead as bulk soil samples and sieved soil samples. The results of the lead sampling are shown on Plate 14. The purpose of this comparison is to identify the ratio of lead concentrations in bulk soil to lead concentrations in sieved soil to identify the tendency, if any, for lead to concentrate in finer fraction soil. MDEQ evaluated the relationship of concentrations of lead in unsieved (bulk) and sieved samples in the "*Background Concentrations of Inorganic Constituents in Montana Surface Soils*" report (Hydrometrics, 2013) and identified that most often, the finer fraction soil contains higher metals concentrations. Therefore, at facilities where metals are likely to be contaminants of concern, analysis of the finer fraction soil is necessary.



In order to evaluate the difference in bulk lead concentrations vs. sieved lead concentrations, a statistical analysis was performed in accordance with the methodology outlined by MDEQ. A ratio of sieved analysis to bulk analysis was calculated for each sample location. Then the 95% Upper Confidence Limit (UCL) on the mean of all the ratios was calculated using ProUCL Software (ProUCL Software, Version 5.1.002, May 2016). The 95% UCL was then used as a factor applied to bulk samples collected as part of the Phase I Site Characterization.

Table 11 provides the analytical data as well as a comparison of lead concentrations in bulk soil to lead concentrations in sieved soil, and the factored bulk soil lead concentrations based on the 95% UCL. The ProUCL calculation output is provided as Appendix O.

A summary of the mean concentrations and mean ratio of the bulk lead concentrations and sieved lead concentrations is provided below:

| Analyte | Bulk Soil Mean Concentration (mg/kg) | Sieved Soil Mean Concentration (mg/kg) | Mean Ratio of Sieve to Bulk |
|---|---|---|---|
| Lead | 21.1 | 27.1 | 1.4 |

The 95% UCL on the mean of all the bulk-sieve ratios were calculated to be 2.2 using the ProUCL suggested Chebyshev (Mean, Standard Deviation) UCL method. The factor of 2.2 was applied to the bulk concentrations by multiplying by the original bulk concentration, and compared to USEPA Residential and Industrial RSLs.

Overall, the data identify a difference in mean concentrations, with sieved soil mean lead concentrations generally higher than bulk soil mean lead concentrations. Although these data indicate a tendency for lead to concentrate in the finer fractions of soil at the Site, there were no exceedances of USEPA Industrial and Residential RSLs for lead within any of the factored bulk concentrations.



### 3.4.2 Operational Area Soil Quality

The incremental soil sampling program described in Section 2.7 was implemented to evaluate soil quality within the Operational Area, which was defined in the RI/FS Work Plan as an area where historical operations may have been conducted but no known source area exists. The following section provides a summary of the soil quality based on the incremental soil sampling laboratory analytical data that were generated by Roux Associates during the Phase I Site Characterization. Data summary tables containing all of the incremental soil sampling data from the Operational Area generated during the work are provided in Appendix L, Tables L8 through L12. As discussed in Section 3.4.2.4, three DUs were resampled and Appendix L, Tables L8 through L12 also include the analytical data from the resampling.

Tables 12 and 13 provide a statistical summary of the analytical results for incremental soil samples collected within 43 decision units (DUs) within the Operational Area. These tables identify the frequency of detection; as well as the minimum, maximum and average detected concentrations, of each analyte in soil for the respective depth interval. In addition, the statistical summary tables provide the frequency that the measured concentration of each analyte in soil exceeded the human health screening criteria as noted in the RI/FS Work Plan and SAP.

An evaluation of the statistical summary of soil data from the Operational Area presented in Tables 12 and 13 indicates the following about the Operational Area soil conditions:

- Cyanide was detected in 100% of the incremental soil samples. Cyanide was detected at concentrations above the USEPA Industrial RSL of 15 mg/kg in 5% of surface samples, but did not exceed the USEPA Industrial RSL in any shallow samples within the Operational Area. Cyanide was detected at concentrations above the USEPA Residential RSL of 2.3 mg/kg in 7% of surface samples and 7% of shallow samples.

- Fluoride was detected in 100% of the incremental soil samples. Fluoride did not exceed the USEPA Industrial RSL of 4,700 mg/kg in any sample collected within the Operational Area. Fluoride was detected at concentrations above the USEPA Residential RSL of 310 mg/kg in 33% of surface samples and 26% of shallow samples.

- SVOCs (primarily PAHs similar to Site-wide soil) were detected frequently across the Operational Area. Twelve PAHs analytes were detected in greater than 90% of the samples, with concentrations exceeding USEPA Residential RSLs for eight different PAH analytes, and USEPA Industrial RSLs for six different PAH analytes.

- Metals were detected frequently across the Site. Seventeen different metal analytes were detected at frequencies between 90 and 100 percent of the samples collected, which is indicative of metals as naturally occurring substances in the environment. Exceedances of USEPA Residential RSLs were observed for several metals, primarily similar to Site-wide soil (aluminum, arsenic, cobalt, iron, manganese, and thallium). Arsenic was detected at concentrations exceeding the USEPA Industrial RSL of 3 mg/kg in 100% of samples collected from the Operational Area, similar to Site-wide soils. [Note: As further discussed in Section 3.4.4.4, arsenic commonly exceeds the Industrial RSL in soils throughout Montana.]

- PCBs were detected in approximately 7% of the samples collected within the Operational Area. PCBs were detected at concentrations exceeding the USEPA Residential RSL for PCB Aroclor-1254 of 0.12 mg/kg in two of the incremental soil samples; surface soil sample CFISS-013 and shallow soil sample CFISS-020. PCBs did not exceed USEPA Industrial RSLs in any of the samples collected within the Operational Area.

- Pesticides were not detected in any incremental soil sample collected within the Operational Area.

- Similar to the Site-wide soils, the analytical soil data from the Operational Area indicate that concentrations of PAHs and metals were observed that often exceed the USEPA Groundwater RSSLs for one or more analyte. Therefore, the results from the soil sampling will also be evaluated in tandem with the groundwater sampling analytical data collected from the monitoring wells within the Operational Area to assess whether, and to what extent, constituents detected in soil are impacting groundwater quality.

Based on the statistical summary and a review of the Operational Area soil conditions, maps displaying data for cyanide, fluoride, selected PAHs, and selected metals were created to visually evaluate the areal distribution and magnitude of exceedances of each compound. The various maps are provided in Appendix N, Plates N8 through N12. The sections below provide additional detail regarding the conditions within the Operational Area incremental soil samples.

#### 3.4.2.1 Operational Area Cyanide and Fluoride

The distribution of cyanide and fluoride within the Operational Area is shown in Appendix N, Plate N8. These data indicate the following:

- Cyanide and fluoride were detected in 100% of the incremental soil samples collected in the Operational Area;

- Cyanide was detected at concentrations above the USEPA Industrial RSL of 15 mg/kg in two incremental soil samples, both in surface samples collected in the Former Drum Storage Area (CFISS-002 and CFISS-003). Cyanide concentrations were above the USEPA Residential RSL of 2.3 mg/kg from four additional incremental soil samples including in three surface soil samples from within the Former Drum Storage Area (CFISS-001, CFISS-002, and CFISS-003) and the shallow soil sample collected at CFISS-014.

- Fluoride was detected at concentrations above the USEPA Residential RSL of 310 mg/kg in 25 incremental soil samples collected from 14 DUs within the Operational Area. Fluoride concentrations exceeded the USEPA Residential RSL in 33% of surface samples and 26% of shallow samples. Although fluoride was detected frequently above the USEPA Residential RSL, no concentrations exceeded the USEPA Industrial RSL of 4,700 mg/kg in any sample collected from the Operational Area.

#### 3.4.2.2 Operational Area PAHs

PAHs that were most frequently detected in soil from within the Operational Area at concentrations exceeding USEPA Industrial and Residential RSLs are shown in Appendix N, Plates N9 and N10. The PAH data indicate the following:

- PAHs frequently detected at concentrations above USEPA Industrial RSLs within the Operational Area include benzo[a]anthracene, benzo[a]pyrene, benzo[b]fluoranthene, benzo[k]fluoranthene, dibenz(a,h)anthracene, and indeno[1,2,3-cd]pyrene.

- Similar to Site-wide soils, PAH exceedances are distributed throughout the Operational Area, and are similar in magnitude to PAH exceedances observed in discrete soil samples collected around the Main Plant Area.

- Similar to Site-wide soils, the frequency and magnitude of exceedances decrease with increasing depth from surface samples to shallow samples across the Operational Area; however, four PAHs are detected at concentrations greater than USEPA Industrial RSLs in more than 20% of shallow incremental soil samples from within the Operational Area.

#### 3.4.2.3 Operational Area Metals

Metals that were most frequently detected in soil from within the Operational Area at concentrations exceeding USEPA Industrial and Residential RSLs are shown in Appendix N, Plates N11 and N12. The metals data indicate the following:

- Seventeen different metals were detected in all incremental soil samples collected within the Operational Area.
- Similar to Site-wide soils, aluminum, arsenic, cobalt, iron, and manganese were detected at concentrations exceeding USEPA Residential RSLs in all incremental soil samples.
- Arsenic was detected at concentrations exceeding the USEPA Industrial RSL of 3 mg/kg in 100% of incremental soil samples. Arsenic was detected with concentrations greater than ten times the USEPA Industrial RSL in the incremental soil sample CFISS-038. [Note: As further discussed in Section 3.4.4.4, arsenic commonly exceeds the Industrial RSL in soils throughout Montana.] No other metals were detected at concentrations above USEPA Industrial RSLs.
- The areal distribution of metals exceedances is widespread across the Operational Area and in general concentrations appear similar within the two sampling depth intervals.
- Lead was detected in 100% of the incremental soil samples collected within the Operational Area. Lead was detected at concentrations exceeding the USEPA Residential RSL of 400 mg/kg in one incremental soil sample (CFISS-006).



#### 3.4.2.4 Comparison of Field vs. Lab Processing of Incremental Soil Samples

The following section provides a comparison of the incremental soil sampling analytical results that were generated using two different sample processing procedures during the Phase I Site Characterization. Initially, the incremental soil samples collected from DUs 001 through 015 were field processed by Roux Associates/Hydrometrics personnel. As documented in Field Modification #4, field processing by Roux Associates/Hydrometrics was discontinued after sampling of DUs 001 through 015, and full composite samples were shipped to TestAmerica for laboratory controlled pre-processing and preparation in accordance with their SOP for ISM sampling. As part of this modification, three DUs (DU 002, 006, and 008) were re-sampled to allow for a comparison of the results from the two methods (field processing vs. laboratory processing), and for assessment of whether or not the initial field processing approach could have resulted in either a low or high bias relative to the laboratory processing methods.

Following the re-sampling of DUs 002, 006 and 008, Roux Associates conducted an evaluation of the results in accordance with instructions from the USEPA outlined in field modification #4 in order to determine if re-sampling should potentially occur in the twelve DUs that were not re-sampled. The analytical results for the twelve DUs that have not been re-sampled were adjusted such that the results account for the variability between sampling methodologies and the limited re-sampling of the DUs. The adjusted results were then compared relative to screening thresholds. If the adjusted value exceeded the minimum of the applicable screening values for a depth interval, and did not prior to the adjustment, re-sampling of the entire interval according to the lab processing protocol would be required.

In order to make the adjustment to the results as described above, the maximum relative percent difference (RPD) was determined on a chemical by chemical basis, by comparing the results from the initial sampling (i.e., field processing method), with the results from the re-sampling (i.e., lab processing method). The RPD for each chemical was calculated by using the following formula as outlined in the USEPA National Functional Guidelines (NFG) for Inorganic Superfund Methods Data Review (USEPA, 2014b):

$$RPD = \frac{|S - D|}{(S + D)/2} \times 100$$

**Where,**

RPD = Relative Percent Difference
S = Sample Result (original)
D = Duplicate Result



Note that the maximum RPD was only able to be determined for chemicals where one or both samples indicated detected values. For those chemicals where only one sample indicated a detected value and the other indicated a non-detect value, a value of one-half the detection limit was used in place of the non-detect value. Once the maximum RPD for each chemical was determined, the maximum RPD was then increased by 10% for each chemical to account for the limited re-sampling and unknown realm of uncertainty. The calculation of the maximum RPD + 10% is summarized in Appendix M.

The original results for the twelve DUs not re-sampled were then increased by this percentage (maximum RPD% +10%) and compared to the minimum of the applicable human health or ecological screening values for a depth interval. Note that results were only adjusted if a maximum RPD for that chemical was calculated. As summarized in Appendix M, all twelve DUs will need to be re-sampled for SVOCs utilizing the revised sampling technique from both the surface and shallow intervals, with the exception of the shallow interval from DU 012. In addition, limited metals re-sampling will occur from the surface interval from DUs 004, 007, and 014 and from the shallow interval from DUs 001 and 014. The RPD evaluation results did not indicate the need to re-sample any DU for PCBs, pesticides or fluoride.



### 3.4.3 Drainage Structure Soil Quality

The following section provides a summary of drainage structure soil quality based on laboratory analytical data that were generated during the Phase I Site Characterization. Data summary tables containing all of the soil data from samples within four drainage structures and from soil borings drilled through three drainage structures are provided in Appendix L, Tables L13 through L18.

Results from the drainage structure sampling were compared to the same USEPA screening levels as Site-wide soils to evaluate soil quality and determine the presence, or lack thereof, of COPCs within and below the drainage structures. Table 14 provides a statistical summary the analytical results for soil collected from the drainage structures. These tables identify the frequency of detection; as well as the minimum, maximum and average detected concentrations, of each analyte in soil for the respective depth interval. In addition, the statistical summary tables provide the frequency that the measured concentration of each analyte in soil from within or below the drainage structure exceeded the screening criteria.

In general, the soil conditions within the drainage structures were observed to be similar to the Site-wide soil conditions described in Section 3.4.1. The drainage structure analytical data indicate the following:

- Cyanide was detected at concentrations above the USEPA Residential RSL of 2.3 mg/kg in one drainage structure sampling location, CFDS-013, immediately below the drainage structure. Cyanide was not detected at concentrations above the USEPA Industrial RSL of 15 mg/kg within or below the sampled drainage structures.

- Fluoride was detected at concentrations above the USEPA Residential RSL of 310 mg/kg in three of the four soil samples from within the drainage structures and two of the three samples from immediately below the drainage structure. Fluoride was not detected above the USEPA Industrial RSL of 4,700 mg/kg within or below the sampled drainage structures.

- SVOCs (primarily PAHs similar to Site-wide soils) were detected at concentrations above USEPA Industrial RSLs in samples from within and immediately below the drainage structures, with a decreasing magnitude of exceedance of PAHs within samples from below the drainage structures.

- Metals (similar to Site-wide soils) were detected at concentrations above USEPA Residential RSLs, most frequently including aluminum, arsenic, manganese, iron and cobalt. Arsenic was detected at concentrations above the USEPA Industrial RSL of 3 mg/kg in seven drainage structure samples.

- VOCs were not detected at concentrations above USEPA Residential or Industrial RSLs in any of the soil samples collected from within or below the drainage structures.

- PCBs and pesticides were not detected in any of the soil samples collected within or below the drainage structures.

- Similar to the Site-wide soils, the results indicate that concentrations of PAHs and metals were observed in the drainage structure soil samples that often exceed the USEPA RSSLs for one or more analyte. Therefore, the results from the soil sampling will also be evaluated in tandem with the groundwater sampling analytical data collected from the Site-wide monitoring wells to assess whether, and to what extent, constituents detected in soil are impacting groundwater quality.

### 3.4.4 Background Area Soil Quality

The following section provides a summary of Background Area soil quality based on laboratory analytical data that were generated during the Phase I Site Characterization. As described in Section 2.8, the background soil sampling locations are located in the western portion of the Site where there were no historical operations (Plate 2). Data summary tables containing all of the Background Area soil data generated during the work are provided in Appendix L, Tables L19 through L24.

Analytical data collected from the Background Area were compared to the same USEPA screening levels as Site-wide soils in order to evaluate soil quality in an area within the Site where no previous historical operations were conducted. Tables 15 through 17 provide a statistical summary of the analytical results for surface soil (0-0.5 ft-bls), shallow soil (0.5-2 ft-bls) and intermediate soil (typically 10-12 ft-bls), respectively. These tables identify the frequency of detection; as well as the minimum, maximum and average detected concentrations, of each analyte in soil for the respective depth interval. In addition, the statistical summary tables provide the frequency that the measured concentration of each analyte in soil exceeded the screening criteria.

The evaluation of the statistical summary of soil data presented in Tables 15 through 17 indicates the following about the Background Area soil conditions:

- Cyanide was detected in greater than 83%, and fluoride within 100%, of all Background Area soil samples. The measured concentrations for both cyanide and fluoride did not exceed USEPA Residential or Industrial RSLs in any samples collected within the Background Area.

- SVOCs (primarily PAHs similar to Site-wide soils) were detected across the Background Area, primarily in surface soil samples (several PAHs were detected in six out of the eight background surface samples). The frequency of PAH detections decreases with depth such that in the intermediate depth, no PAHs were detected. No PAHs were detected at concentrations above USEPA Industrial RSLs in any sampling depth interval. Benzo[a]pyrene and benzo[b]fluoranthene were detected at concentrations above the USEPA Residential RSLs (0.016 mg/kg and 0.16 mg/kg, respectively) in surface soils.

- Metals (similar to Site-wide soils) were detected in all soil samples collected from the Background Area. Aluminum, arsenic, cobalt, iron, and manganese were detected at concentrations above USEPA Residential RSLs. Arsenic was detected at concentrations exceeding the USEPA Industrial RSL of 3 mg/kg in 83% of the samples. [Note: As further discussed in Section 3.4.4.4, arsenic commonly exceeds the Industrial RSL in soils throughout Montana.]

- VOCs (similar to Site-wide soils) were detected across the Background Area. Acetone, benzene, and toluene were mostly commonly detected, with concentrations less than USEPA Residential and Industrial RSLs in all soil samples collected from the Background Area.

- PCBs and pesticides were not detected in any soil sample collected from the Background Area.

- Similar to the Site-wide soils, the results indicate that concentrations of SVOCs and metals were observed that often exceed the USEPA RSSLs for one or more analyte. Therefore, the results from the soil sampling will also be evaluated in tandem with the groundwater sampling analytical data collected from the monitoring well network to assess groundwater quality.

#### 3.4.4.1 Background Area Cyanide and Fluoride

The distribution of cyanide and fluoride within the Background Area is shown in Appendix N, Plate N1. The cyanide and fluoride data collected from Background Area soils during the Phase I Site Characterization indicate the following:

- Cyanide was detected within 88% of surface samples, 88% of shallow samples and 75% of intermediate depth samples.
- Although cyanide was detected widespread across the Background Area, cyanide concentrations are below the USEPA Residential RSL of 2.3 mg/kg in all samples.
- Fluoride was detected within 100% of surface, shallow, and intermediate depth samples collected from the Background Area.
- Although fluoride was detected widespread across the Background Area, fluoride concentrations are below the USEPA Residential RSL of 310 mg/kg in all samples.

#### 3.4.4.2 Background Area PAHs

PAHs that were most frequently detected in soil at concentrations exceeding USEPA Residential RSLs within the Background Area are shown in Appendix N, Plates N2 through N4. The PAH data collected from Background Area soils during the Phase I Site Characterization indicate the following:

- PAHs that were most frequently detected included benzo[a]pyrene, benzo[b]fluoranthene, chrysene, fluoranthene, phenanthrene, and pyrene (> 33%).
- The frequency and magnitude of exceedances decrease with increasing depth, with the majority of detections in the surface soil. There were no detections of PAHs in the intermediate depth (10-12 ft bls) soil samples in the Background Area.
- With the exception of benzo[a]pyrene and benzo[b]fluoranthene, PAH concentrations are typically less than USEPA Residential RSLs within all sampling intervals in the Background Area. PAHs were detected at concentrations less than USEPA Industrial RSLs within all sampling intervals in the Background Area.

#### 3.4.4.3 Background Area Metals

Metals that were most frequently detected in soil at concentrations exceeding USEPA Residential RSLs within the Background Area are shown in Appendix N, Plates N5 through N7. The metals data collected from the Background Area during the Phase I Site Characterization indicate the following:

- Sixteen different metals were detected in 100% of the surface, shallow, and intermediate depth soil samples collected from the Background Area.

- The areal distribution of the detected metals is widespread across the Background Area and in general the concentrations appear similar across the three sampling intervals.
- Aluminum, arsenic cobalt, iron, and manganese were detected at concentrations exceeding USEPA Residential RSLs in at least 79% of the samples collected in the Background Area. Arsenic was detected at concentrations exceeding the USEPA Industrial RSL of 3 mg/kg within 88% of surface samples, 88% of shallow samples and 75% of intermediate depth samples. Exceedances of USEPA Residential and Industrial RSLs for metals are similar to Site-wide soils.

#### 3.4.4.4 Background Area Statistics Compared to Site-Wide Soils

The following section describes the statistical evaluation of the analytical data for soil within the Background Area and provides a comparison of the Background Area data to the concentrations measured during the Site-wide discrete soil sampling. The following evaluation focuses on metals because metals are naturally occurring substances in the environment, and because it is not readily apparent, from evaluation of Site-wide soil provided in the prior sections of this Data Summary Report, which metals may be considered as Site-related contaminants.



Cyanide, fluoride and PAHs can also be found as naturally occurring substances within the environment; however, as specified in the preliminary conceptual site model within the RI/FS Work Plan, these constituents were presumed to be primary COPCs at the Site based upon knowledge of historical Site operations and the results of prior investigations. This presumption has been further confirmed based upon the concentrations of these COPCs detected in soil within Site features at various locations across the Site; as well as, in the case of cyanide and fluoride, in groundwater as described in Section 3.5. Therefore, cyanide, fluoride and PAHs were not included in the statistical evaluation of the Background Area soil quality for this Data Summary Report.

The Background Area is located in an open field area within the western portion of Site where historical aerial photographs dating back to the 1940s show un-forested areas with no evidence of industrial operations. Prior to using the metals concentrations measured in the Background Area as a reference for evaluating which metals are Site-related, an evaluation was performed to assess whether the metals concentrations within the Background Area are representative of natural conditions that have not been affected by historical Site operations. In order complete this assessment, the surface soil (0-0.5 ft-bls) metals concentrations measured within the

Background Area were compared to existing Montana surface soil metals data from the Montana Background Soils Investigation (MSBI), as reported in “Background Concentrations of Inorganic Constituents in Montana Surface Soils” (Hydrometrics, 2013). As summarized in the below table, a comparison of the mean concentration for metals in surface soil indicates that in general, Background Area mean concentrations are less than MBSI mean concentrations. Mean surface soil concentrations for aluminum, barium, and copper were greater in the Background Area than the MBSI concentrations. The mean concentrations for copper (17.9 mg/kg in Background Area surface soil and 17.6 mg/kg in MSBI surface soil) are almost identical, indicating that the concentrations of these metals can be considered representative of natural conditions. MBSI did not provide mean values for calcium, cyanide, magnesium, potassium, or sodium (indicated as not available [NA] on the below summary table).

| **Analytical Parameter** | **Phase I Background Area Mean (mg/kg) for Surface Soil** | **Phase I Background Area Mean (mg/kg) for Shallow Soil** | **Phase I Background Area Mean (mg/kg) for Intermediate Depth Soil** | **MBSI Surface Soil Mean (mg/kg) for Surface Soil** |
|---|---|---|---|---|
| | ***(0-0.5 ft-bls)*** | ***(0.5-2 ft-bls)*** | ***(10-12 ft-bls)*** | ***(0-0.5 ft-bls)*** |
| **Aluminum** | 21,525 | 18,575 | 7,389 | 15,500 |
| **Arsenic** | 5.2 | 5.0 | 4.0 | 11.4 |
| **Barium** | 305.1 | 255.6 | 73.4 | 195 |
| **Beryllium** | 0.85 | 0.71 | 0.35 | 0.7 |
| **Calcium** | 5,938 | 4,430 | 16,950 | NA |
| **Chromium** | 13.2 | 12.9 | 10.7 | 19.6 |
| **Cobalt** | 6.0 | 6.1 | 4.6 | 7.3 |
| **Copper** | 17.9 | 15.9 | 11.1 | 17.6 |
| **Iron** | 16,518 | 15,901 | 11,564 | 18,200 |
| **Lead** | 12.8 | 13.8 | 6.2 | 15.3 |
| **Magnesium** | 8,455 | 8,426 | 9,084 | NA |
| **Manganese** | 375.3 | 418.3 | 386.1 | 508 |
| **Mercury** | 0.02 | 0.02 | 0.01 | 0.05 |
| **Nickel** | 12.2 | 11.3 | 8.8 | 16.6 |
| **Potassium** | 1,097.8 | 945.6 | 628.1 | NA |
| **Selenium** | 0.4 | 0.3 | ND | 0.4 |
| **Sodium** | 147 | 151 | 18 | NA |
| **Vanadium** | 13.1 | 12.3 | 8.0 | 30.9 |
| **Zinc** | 55.9 | 44.9 | 28.5 | 60.5 |

The ProUCL software developed by USEPA (ProUCL Software, Version 5.1.002, May 2016) was used to perform additional statistical analyses in order to compare Background Area metals concentrations to Site-wide metals concentrations. As specified in the Phase I Site Characterization SAP, the 95% UCL was calculated on the mean of metals data from the Background Area in order to compare to Site-wide metals data. However, when conducting this evaluation Roux Associates recognized that this was not the best statistical approach because some individual concentrations that are representative of natural conditions would be expected to exceed the 95% UCL on the mean. Therefore, it was determined that using this as the only statistical metric would likely result in the identification of some metal analytes as Site-related when they are present at concentrations within the expected range of background concentrations.

In order to address the above described limitations of using the 95% UCL on the mean, Background Threshold Values (BTVs) were also calculated using the Upper Tolerance Limit (UTL) with 90% coverage and 95% confidence on the mean (UTL 95/90). This is a more statistically valid approach to establishing an upper limit of the expected background metals concentrations for comparison to the metals concentrations detected in individual Site-wide soil samples collected at locations within and around the Site features. This approach is consistent with the USEPA ProUCL User Guide (USEPA, 2015) and USEPA Guidance for Comparing Background and Chemical Concentrations in Soil for CERCLA Sites (USEPA, 2002).



Calculations of the 95% UCL, and the BTV were performed using USEPA's ProUCL software. The Background Area BTV using the UTL 95/90 was calculated using four different data distribution methods; Normal Distribution UTL; Gamma Wilson Hilferty (Gamma WH) UTL; Gamma Hawkins Wixley (Gamma HW) UTL; and Non-Parametric UTL/Highest Concentration. All ProUCL outputs for the distribution methods mentioned above are provided in Appendix P. A summary table of the results for each of the UTL distribution methods output from ProUCL is provided in Appendix Q.

The results from the following three distribution methods were used in an effort to compare Site-wide soil metals data to a range of statistical threshold values:

- Background Area 95% UCL (as specified in the Phase I SAP);
- Background Area Non-Parametric UTL 95/90 (highest Background Area concentration); and

- Background Area UTL 95/90 (using either Gamma HW UTL or Normal UTL, most statistically valid approach).

Table 18 provides the Background Area UTL distribution results for surface soil (0-0.5 ft-bls), shallow soil (0.5-2 ft-bls) and intermediate soil (typically 10-12 ft-bls) for each metal and also includes a comparison to the MBSI UTL. Maps depicting the relative concentrations of metals in Site-wide soil compared to the above Background Area statistical threshold values are provided in Appendix R, Plates R1 through R55. These plates are thematic maps (i.e., color coded dot maps) that facilitate the identification of locations where the Site-wide metal was detected, the locations where analyte concentrations exceed the above Background Area statistical threshold values, and the relative magnitude of the exceedances.

Site-wide metals data compared to Background BTVs indicate that in general, exceedances of the BTVs are focused primarily in the Ponds and around the landfills and the Main Plant Area. Outside of Site features, metals are typically detected at concentrations below the BTVs and the Background Area 95% UCL.

The soil quality data from the Background Area will be further evaluated during preparation of the Risk Assessment Work Plan to determine which metals will be retained for further evaluation at the Site.



### 3.4.5 Borrow Pit Area Soil Quality

As described in Field Modification #6 and Section 2.15, soil samples were collected from test pits within the Borrow Pit Area to provide an initial evaluation of soil conditions within the Borrow Pit Area and to support decisions regarding the acceptability of soil from the Borrow Pit Area for use as fill material as part of the ongoing Site demolition activities being performed by Calbag.

Soil analytical data from samples collected within seven test pits completed across the Borrow Pit Area are summarized in Appendix L, Tables L25 through L30. Soil data results from the Borrow Pit Area were compared to the same screening criteria as Site-wide soils. Tables 19 and 20 provide a statistical summary of the analytical results for Borrow Pit surface soil (0-0.5 ft-bls) and intermediate depth soil (2-4 ft-bls and 4-10 ft-bls), respectively. These tables identify the frequency of detection; as well as the minimum, maximum and average detected concentrations, of each analyte in soil for the respective depth interval. In addition, the statistical summary tables provide the frequency that the measured concentration of each analyte in soil exceeded the screening criteria. The evaluation of the statistical summary data indicates the following about the Borrow Pit Area soil conditions:

- Cyanide was detected in 71% of Borrow Pit Area soil samples. Cyanide concentrations did not exceed USEPA Industrial RSLs or Residential RSLs.
- Fluoride was detected in 100% of Borrow Pit Area soil samples. Fluoride concentrations did not exceed USEPA Residential RSLs or Industrial RSLs.
- SVOCs (primarily PAHs similar to Site-wide soils) were detected in surface Borrow Pit Area soils at concentrations exceeding USEPA Residential RSLs. Benzo[a]pyrene was the only PAH detected in surface soil at concentrations exceeding USEPA Industrial RSLs (detected at three locations; maximum concentration of 0.85 mg/kg). SVOC concentrations did not exceed USEPA Residential RSLs or Industrial RSLs in intermediate depth soils.
- Metals were detected in each soil sample collected from the Borrow Area Pit. Aluminum, cobalt, and iron were detected at concentrations exceeding USEPA Residential RSLs in 20 of 22 samples. Arsenic was detected at concentrations exceeding USEPA Industrial RSLs in 18 of 22 samples collected. As further discussed below, metals detected at concentrations exceeding USEPA RSLs within the Borrow Pit Area are present at similar concentrations within the Background Area.
- VOCs were detected in surface and intermediate depth soils samples with concentrations less than USEPA Residential or Industrial RSLs.
- PCBs and pesticides were not detected in Borrow Pit Area soil samples.
- Similar to the Site-wide soils, the results indicate that concentrations of SVOCs and metals were observed that often exceed the USEPA RSSLs for one or more analyte. Therefore, the results from the Borrow Pit Area soil sampling will also be evaluated in tandem with the groundwater sampling analytical data collected from Site-wide monitoring wells to assess groundwater quality.



Roux Associates submitted a letter report to the USEPA dated December 13, 2016, which summarized the results of the Borrow Pit Area samples that were utilized to evaluate the acceptability for use of these soils as fill material. The sample depth intervals evaluated in the letter included the 2-4 ft-bls and 4-10 ft-bls intervals. Surface soils were not included in the evaluation because surface soils were not approved to be utilized as fill material in accordance with the CFAC Borrow Pit Open Cut Permit filed with the Montana Department of Environmental Quality (MDEQ) (Permit #2724, October 29, 2015).

The letter summarized that metals were detected within the Borrow Pit Area above USEPA Residential and Industrial RSLs; however, based upon review of the historical Site information and aerial photographs previously submitted to USEPA with the Remedial Investigation Work Plan, no industrial Site operations were conducted within the Borrow Pit Area. A comparison of the Phase I Site Characterization analytical results for metals exceeding USEPA Residential RSLs from the Borrow Pit Area, to the Background Threshold Values (BTV) calculated using the Upper Tolerance Limit (UTL) with 90% coverage and 95% confidence on the mean (UTL 95/90) for metals and the mean metals concentrations for bulk soil samples reported in the Montana Background Soil Investigation (MBSI) Report (Hydrometrics, Inc., 2013), was provided in the letter report.



The mean metals concentrations from the Borrow Pit Area were compared to the mean metals concentrations from soils collected in the Background Area as part of the Phase I Site Characterization as described in Section 3.4.4.4 above. A comparison of these analytical data is provided in the below table:

| Analyte | Phase I BorrowPit Area Mean (Intervals 2-4 ft-bls and 4-10 ft-bls [mg/kg]) | Phase I Background Area Mean (0.5-2 and 10-12 ft bls) (mg/kg) | MBSI UTL (0-0.5 ft-bls) (mg/kg) | MBSI Mean (0-0.5 ft-bls) (mg/kg) |
|---|---|---|---|---|
| **Aluminum** | 9,741 | 12,982 | 25,941 | 15,500 |
| **Arsenic** | 4.74 | 4.49 | 22.5 | 11.4 |
| **Cobalt** | 4.62 | 5.3 | 10 | 7.3 |
| **Iron** | 12,532 | 13,733 | 24,400 | 18,200 |
| **Manganese** | 338 | 402 | 880 | 508 |

The data comparisons indicate that the concentrations measured in the Borrow Pit Area are similar to or less than concentrations within Background Area at the Site and the background concentrations for the State of Montana. These findings further support that the concentrations of metals exceeding USEPA Residential RSLs from the Borrow Pit Soil are attributable to natural conditions that are typical of Montana soils.

### 3.4.6 Fate and Transport Soil Parameters

Total organic carbon (TOC), soil grain size, soil bulk density and soil moisture content were analyzed on selected soil samples to support future fate and transport assessment and modeling efforts, if necessary as part of the RI/FS. The remainder of this section summarizes the analytical results for the fate and transport parameters.

#### 3.4.6.1 Total Organic Carbon

Total organic carbon (TOC) in soil was analyzed in 17 surface samples, 20 shallow samples, 21 intermediate samples, and 16 below water table samples across the Site. TOC results are provided in Appendix L, Table L6. The TOC data indicate the following:

- TOC ranged from 3,920 mg/kg to 56,500 mg/kg in surface soils;
- TOC ranged from 1,450 mg/kg to 57,200 mg/kg in shallow soils;
- TOC ranged from 816 mg/kg to 316,000 mg/kg in intermediate depth soils; and
- TOC ranged from 213 mg/kg to 44,700 mg/kg in below water table soils.



#### 3.4.6.2 Grain Size

Grain size was analyzed in 18 soil samples collected at various depths during monitoring well drilling activities and from 24 soil and sediment samples collected within the Site surface water features including: Cedar Creek, Cedar Creek Reservoir Drainage Overflow, the North and South Percolation Ponds, and the Flathead River. The results of the grain size analysis are displayed on Plate 13 and are summarized in Appendix S, Table S1.

The sampling depths that were selected for grain size analysis during drilling were selected to represent a range of soil lithologies observed during drilling, as described in Section 2.6. Six samples were collected at or near the water table within the coarse grained outwash deposits that comprise the upper hydrogeologic unit and 12 samples were collected below the water table within the glacial till. The results from the grain size analysis performed on drilling samples indicate:

- The outwash deposits were primarily comprised of sands, with an average composition of 11.5 percent gravel, 67.6 percent sand, and 29.2 percent fines.
- The glacial till deposits varied in grain size with more fines, with an average composition of 19.2 percent gravel, 41.8 percent sand, and 39 percent fines.

Grain size was evaluated on all 24 samples collected within Site surface water features to characterize the grain size of surface (0-0.5 ft-bls) soils and sediment within each feature; and, to evaluate whether each area is a potential depositional area for sediment. The results from the grain size analysis at these locations indicate:

- The six samples collected within the main channel of the Flathead River were comprised primarily of sand, with an average of 87.8% sands and an average of 12.3% fines.
- The samples collected within backwater area of the Flathead River near the Seep were comprised of primarily fines, with an average of 30.9% sands and an average of 69.1% fines.
- The samples collected within the Cedar Creek Reservoir Overflow Drainage were primarily composed of sands, with an average of 67.3% sands and an average of 32.5% fines.
- The samples collected within the Cedar Creek were primarily composed of sands, with an average of 64.7% sands and an average of 35.3% fines.
- The samples collected within the North Percolation Ponds, South Percolation Ponds, and Northern Surface Water Feature were primarily composed of fines, with an average of 34.6% sands and an average of 65.5% fines.



### 3.4.6.3 Soil Moisture Content and Bulk Density

Soil moisture content and bulk density was analyzed in 18 soil samples collected at various depths during monitoring well drilling activities. The sampling depths that were selected for analysis were selected to represent a range of soil lithologies observed during drilling, as described in Section 2.6. Six samples were collected at or near the water table within the coarse grained outwash deposits that comprise the upper hydrogeologic unit and 12 samples were collected below the water table within the glacial till. The results are summarized in Appendix S, Table S2. The results from the moisture content and bulk density analysis performed on drilling samples indicate:

- The outwash deposits had an average moisture content of 19.93% and a bulk density of 1.62 g/cc.
- The glacial till deposits had an average moisture content of 11.77% and a bulk density of 1.71 g/cc.

The above findings further support the observations described in Section 3.3.1, that the glacial till were typically drier and denser when compared to the outwash and alluvium within the upper hydrogeologic unit.

### 3.5 Groundwater Quality

The following sections provide a summary of groundwater quality based on field and laboratory analytical data that were generated during the Phase I Site Characterization. Tables containing all of the groundwater quality data generated during the work are provided in Appendix T, Tables T1 through T4. Additionally, laboratory data reports were provided to the USEPA as separate submittals throughout the work. Electronic Data Deliverables (EDDs) with the groundwater data were also provided online for download by the USEPA from the CFAC RI/FS project database.

#### 3.5.1 Field Parameters

Field parameters measured during well purging activities immediately prior to collection of groundwater samples and during monitoring well development activities are provided on field datasheets included in Appendix C. The field parameter data were reviewed to evaluate any potential anomalies in general groundwater chemistry that could potentially be influencing the groundwater sampling results.

Turbidity was the primary field parameter that was utilized to evaluate monitoring well development completeness. In accordance with the SAP, well development continued until the discharge water met a field turbidity value of 10 formazin nephelometric units/nephelometric turbidity units (FNU/NTU) or less; or, until the field turbidity did not improve for a period of two hours during active development. As discussed in Section 2.11.1, review of the development data indicates that approximately 24 monitoring wells out of 64 wells that redeveloped did not achieve a value of 10 FNU/NTU after two hours of development.

As part of the field parameter data review, anomalously high pH (i.e., above 10 SUs) was identified in 11 monitoring wells (one well installed near the water table and ten wells installed deeper). These monitoring wells also typically produced elevated conductivities and low Oxidative Reductive Potential (ORP). Based on the distribution of wells with across the Site and the groundwater chemistry observed in the sampling data (as discussed in Section 3.5.2) the elevated pH conditions were attributed to the cement grout used during well construction. The elevated pH conditions were discussed with the USEPA and MDEQ during project update conference calls and via email correspondence. The USEPA requested that the pH conditions continue to be assessed as part of the ongoing groundwater monitoring activities at the Site.

As part of the pH evaluation, Roux Associates mobilized personnel from Hydrometrics to the Site on October 11, 2016 with the objective of determining if reducing pH levels was possible by further purging groundwater from the wells (i.e., flushing the well screen). Hydrometrics personnel were onsite from October 11 through 14, 2016 and October 18 through 20, 2016 and purged all 11 wells that were identified as having pH over 10. During the purging, Hydrometrics monitored the pH conditions to observe whether pH was reduced in each well. The monitoring indicated that pH in six of the eleven wells were reduced to below 10 as a result of the purging activities. Monitoring wells with pH remaining above 10 after the purging included CFMW-008a, 032a, 044a, 53a, and 57a.



After the purging efforts performed by Hydrometrics were completed, Cascade subsequently mobilized to the Site on December 12 through 15, 2016 to complete additional purging at the eleven monitoring wells. During the purging, Cascade monitored the pH conditions to observe whether pH was reduced in each well. The monitoring indicated that six of the eleven wells had pH over 10 including CFMW-008a, 032a, 044a, 049a, 53a, and 57a. The pH in Site-monitoring wells will continue to be evaluated during future sampling rounds.

### 3.5.2 Groundwater Laboratory Data

Laboratory analytical results for groundwater samples collected from Site monitoring wells were evaluated to determine the presence, or lack thereof, of COPCs in Site groundwater. Tables 21 and 22 provide a statistical summary of the analytical results for groundwater data from monitoring wells screened in the upper hydrogeologic unit and below the upper hydrogeologic unit, respectively. These tables identify the frequency of detection; as well as the minimum, maximum and average detected concentrations, of each analyte in groundwater for the respective set of monitoring wells. In addition, the statistical summary tables provide the frequency that the measured concentration of each analyte in groundwater exceeded the following human health screening criteria as noted in the RI/FS Work Plan and SAP:

- MDEQ Circular DEQ-7, Human Health Numeric Water Quality Standards (MDEQ, 2012);
- USEPA Drinking Water Maximum Contaminant Levels (May 2016); and
- USEPA Tapwater RSLs (May 2016).

In addition to comparisons to the human health screening criteria, evaluation of the groundwater data with respect to ecological screening criteria is provided within the SLERA Summary Report submitted under separate cover.



The statistical summary of groundwater data presented in Tables 21 and 22 indicates the following about the Site-wide groundwater conditions relative to the MDEQ Human Health Standards and USEPA MCLs:

- Total cyanide was detected in 75% of the groundwater samples. Total cyanide was detected at concentrations greater than the DEQ-7 Human Health Standard / USEPA MCL of 200 µg/L in 21 samples from monitoring wells screened in the upper hydrogeologic unit, primarily located downgradient of the West Landfill and Wet Scrubber sludge pond. Total cyanide did not exceed the DEQ-7 Human Health Standard / USEPA MCL in any groundwater samples from monitoring wells screened below the upper hydrogeologic unit.
- Fluoride was detected in 95% of the groundwater samples. Fluoride was detected at concentrations greater than the DEQ-7 Human Health Standard / USEPA MCL of 4,000 µg/L in seven groundwater samples from monitoring wells screened in the upper hydrogeologic unit, primarily located downgradient of the West Landfill and Wet Scrubber Sludge Pond. Fluoride did not exceed DEQ-7 Human Health Standards / USEPA MCL in any groundwater samples from monitoring wells screened below the upper hydrogeologic unit.
- Metals that were frequently detected in Site-wide soil were detected at a limited frequency in groundwater, including arsenic, aluminum, cobalt, and iron. Arsenic was detected in groundwater samples at concentrations exceeding the DEQ-7 Human Health Standard / USEPA MCL of 10 µg/L in two monitoring wells screened in the upper hydrogeologic unit (CFMW-012 and CFMW-015). Barium was detected in groundwater samples at concentrations exceeding the DEQ-7 Human Health Standard (1,000 µg/L) and USEPA MCL (2,000 µg/L) in one monitoring well screened below the upper hydrogeologic unit (CFMW-053a).

- SVOCs and VOCs had limited detections in groundwater samples (<15%), and did not exceed DEQ-7 Human Health Standards / USEPA MCLs in any groundwater samples, including at the areas within the Former Drum Storage Area and Operational Area where VOCs were detected in passive soil gas samples (Section 3.2.2).

- The RI/FS Work Plan also specified the Vapor Intrusion Screening Level (VISL) calculator as a criterion to be considered at the Site. The maximum concentrations of each VOC detected in groundwater within the upper hydrogeologic unit were entered into the USEPA Vapor Intrusion Screening Level (VISL) Groundwater Concentration to Indoor Air Concentration (GWC-IAC) Calculator Version 3.5.1 (USEPA, 2016), as presented in Appendix U. The results indicate that all estimated vapor intrusion carcinogenic risks were less than 1E-6 and all hazard quotients were less than 1.

The groundwater analytical data were compared to the USEPA Tapwater RSLs (May 2016) in accordance with the RI/FS Work Plan and SAP. It should be noted that the USEPA Tapwater RSLs are conservative screening levels, such that for many analytes any detection results in an exceedance. Note that in many cases, federally enforceable drinking water standards designed to protect public health (e.g., MCLs) are orders of magnitude higher than these conservative screening levels.



The comparisons to the USEPA Tapwater RSLs indicate:

- Total cyanide was detected at concentrations exceeding the USEPA Tapwater RSL of 0.15 µg/L in 91% of groundwater samples from monitoring wells screened in the upper hydrogeologic unit but only 2 of 13 (15%) of groundwater samples from monitoring wells screened below the upper hydrogeologic unit. The maximum concentration of cyanide in groundwater below the upper hydrogeologic unit was 5.9 µg/L.

- Fluoride was detected at concentrations exceeding the USEPA Tapwater RSL of 80 µg/L in 94% of groundwater samples from monitoring wells screened in the upper hydrogeologic unit but only one (8%) of groundwater samples from monitoring wells screened below the upper hydrogeologic unit.

- Metals including antimony, arsenic, barium, cobalt, iron, selenium, and vanadium were detected at concentrations greater than USEPA Tapwater RSLs (USEPA, 2016).

- SVOCs and VOCs were not detected above USEPA Tapwater RSLs (USEPA, 2016), with the exception of 1,2-dichloroethane in one groundwater sample collected from monitoring well CFMW-044b.

The groundwater analytical data from monitoring well CFMW-001 (the northern-most monitoring well on the Site) were used to compare upgradient, background groundwater quality to downgradient groundwater quality within the Site. The data indicates:

- Total cyanide was detected at concentrations exceeding the concentration measured in CFMW-001 (2.4 µg/L) in 39 of the groundwater samples (83%) from monitoring wells screened in the upper hydrogeologic unit but only 1 of 13 (8%) of groundwater samples from monitoring wells screened below the upper hydrogeologic unit. The maximum concentration of cyanide in groundwater below the upper hydrogeologic unit was 5.9 µg/L.

- Fluoride was detected at concentrations exceeding the concentration measured in CFMW-001 (91.7 µg/L) in 91% of groundwater samples from monitoring wells screened in the upper hydrogeologic unit and 8 of 13 groundwater samples (62%) from monitoring wells screened below the upper hydrogeologic unit.

- Metals including sodium, potassium, magnesium, iron, and manganese were detected at concentrations greater than those measured in CFMW-001 in more than 50% of groundwater samples from monitoring wells screened in the upper hydrogeologic unit. Metals including sodium, potassium, magnesium, and aluminum were detected at concentrations greater than those measured in CFMW-001 in more than 50% of groundwater samples from monitoring wells screened below the upper hydrogeologic unit.



Based on the statistical summary and a review of the groundwater conditions, maps displaying data for cyanide, fluoride, and selected metals were created to visually evaluate the areal distribution and magnitude of exceedances of each compound. The various maps are provided in Appendix V as thematic dot maps. The following sections provide additional detail regarding the groundwater results. The sections below also provide an evaluation of analytes that exceeded USEPA RSSLs in Site-wide soil compared to analyte detections in Site-wide groundwater to assess whether, and to what extent, constituents detected in soil are impacting groundwater quality.

#### 3.5.2.1 Cyanide and Fluoride

The distribution of cyanide and fluoride is shown in Appendix V, Plates V1, V2, V17, and V18. These data indicate the following:

- Cyanide was detected in 91% of the groundwater samples collected from wells screened in the upper hydrogeologic unit and 15% of groundwater samples collected from wells screened below the upper hydrogeologic unit. The greatest concentrations of cyanide (greater than ten times the DEQ-7 Human Health Standard / USEPA MCL of 200 µg/L) were detected immediately downgradient of the West Landfill and Wet Scrubber Sludge Pond in monitoring wells screened in the upper hydrogeologic unit, including CFMW-002, 010, 012, 014, and 015, with concentrations ranging from 2,060 µg/L to 7,320 µg/L. Cyanide concentrations decrease in monitoring wells screened in the upper hydrogeologic unit with increasing distance away from the West Landfill and Wet Scrubber Sludge Pond. Cyanide concentrations in monitoring wells screened below the upper hydrogeologic unit were non-detect in samples from 11 of 13 monitoring wells. There were two, isolated detections: one at an estimated concentration at 2.1 µg/L (CFMW-003a) and one at a concentration of 5.9 µg/L (CFMW-044b). Cyanide concentrations are non-detect in all groundwater samples from monitoring wells bordering the western boundary of the Site in the vicinity of Aluminum City.

- Fluoride was detected in 98% of groundwater samples from monitoring wells screened in the upper hydrogeologic unit and 85% of groundwater samples from monitoring wells screened below the upper hydrogeologic unit. Similar to cyanide, the highest concentrations of fluoride (exceeding the DEQ-7 Human Health Standard / USEPA MCL of 4,000 µg/L) were detected immediately downgradient of the West Landfill and Wet Scrubber Sludge Pond in monitoring wells CFMW-002, 010, 012, 014, and 015, with concentrations ranging from 8,300 µg/L to 38,400 µg/L. Concentrations of fluoride also exceeded the DEQ-7 Human Health Standard / USEPA MCL in two monitoring wells located immediately north of the Main Plant Area and screened in the upper hydrogeologic unit, (CFMW-032 and 034), with concentrations of 5,210 µg/L and 4,530 µg/L, respectively. Similar to cyanide, fluoride concentrations decrease in monitoring wells screened in the upper hydrogeologic unit with increasing distance away from the West Landfill and Wet Scrubber Sludge Pond. Fluoride concentrations in monitoring wells screened below the upper hydrogeologic unit were typically an order of magnitude less than concentrations of fluoride in upper hydrogeologic unit monitoring wells, and are similar to background concentrations observed in upgradient monitoring well CFMW-001. Concentrations of fluoride are below the DEQ-7 Human Health Standard / USEPA MCL in all monitoring wells bordering the western boundary of the Site in the vicinity of Aluminum City.



#### 3.5.2.2 Metals

The distribution of metals in groundwater (i.e., those metals that were also commonly detected in Site-wide soils) is shown in Appendix V, Plates V3 through V10 and V19 through V26. The groundwater metals data indicate the following:

- Similar to Site-wide soils, multiple metals likely related to background concentrations for Montana were detected in groundwater samples including 18 different metals in groundwater samples from monitoring wells screened in the upper hydrogeologic unit, and 15 different metals in groundwater samples from monitoring screened below the upper hydrogeologic unit. The most frequently detected metals include calcium, potassium, sodium, and barium in 100% of groundwater samples, magnesium in 92% of groundwater samples, and copper, manganese, and iron in more than 50% of groundwater samples.

- Concentrations of metals are generally below the DEQ-7 Human Health Standards / EPA MCLs in all groundwater samples, with the exception of arsenic at two monitoring well locations located immediately downgradient of the West Landfill and Wet Scrubber Sludge Pond within the upper hydrogeologic unit (CFMW-012 and 015) and barium in one monitoring well location near the Rod Mill below the upper hydrogeologic unit (CFMW-053a). Although concentrations of detected metals are generally below the DEQ-7 Human Health Standards / USEPA MCLs, the concentrations of select metals including aluminum, arsenic, cobalt, iron, and lead are highest in water table monitoring wells located immediately downgradient of the West Landfill and Wet Scrubber Sludge Pond, in the same areas as the elevated cyanide and fluoride concentrations. Unlike Site-wide soils, calcium, potassium, and sodium were detected in 100% of groundwater samples. Given the frequency of detection in groundwater and lack of frequent detections in Site-wide soils, these analytes are likely naturally occurring in groundwater. However, several of the deep wells have notably higher calcium concentrations (e.g., maximum of 922,000 µg/L at CFMW-053a), as compared to concentrations of calcium within the wells screened near the water table (average concentration of 62,820 µg/L). These elevated calcium concentrations in the deep wells appear to be attributable to the cement grout used during the well construction as previously noted in Section 3.5.1.



#### 3.5.2.3 General Chemistry

General chemistry analyses including ammonia, chloride, hardness (as calcium carbonate), nitrate + nitrite (as nitrogen), orthophosphate (as phosphorus), and sulfate were performed on groundwater samples to obtain data that could be utilized in chemical fate and transport evaluations and modeling, if needed, in the future as part of the RI/FS. General chemistry results were also compared to the standards and RSLs where available. The distribution of the general chemistry concentrations in groundwater are shown in Appendix V, Plates V11 through V16 and V27 through V32. The general chemistry data indicate the following:

- Sulfate was detected in 100% of the groundwater samples ranging from a minimum concentration of 797 µg/L to a maximum concentration of 694,000 µg/L, with the highest concentration detected at CFMW-003 adjacent to the Industrial Landfill.

- Hardness as calcium carbonate) was detected in 100% of the groundwater samples ranging from a minimum concentration of 28,000 µg/L to a maximum concentration of 336,000 µg/L, with the highest concentration detected at CFMW-035 in the Main Plant Area.

- Chloride was detected in 98% of the groundwater samples with a maximum concentration of 39,100 µg/L at CFMW-003 adjacent to the Industrial Landfill.

- Ammonia was detected in 38% of the groundwater samples with a maximum concentration of 23,600 µg/L in CFMW-015 adjacent to the Wet Scrubber Sludge Pond.

- Nitrate + nitrite (as nitrogen) was detected in 66% of the samples, with five groundwater samples exceeding the DEQ-7 Human Health Standard / USEPA MCL of 10,000 µg/L (locations CFMW-002, 010, 012, 014, and 015), which are all located immediately downgradient of the West Landfill / Wet Scrubber Sludge Pond.

- Orthophosphate was only detected in one groundwater sample at a concentration of 267 µg/L from monitoring well CFMW-015 adjacent to the Wet Scrubber Sludge Pond.

## 3.6 Surface Water Quality

The following section provides a summary of surface water quality based on laboratory analytical data and field data that were generated during the Phase I Site Characterization. Data tables with surface water data generated during the work are provided in Appendix W. Additionally, laboratory data reports were provided to the USEPA as separate submittals throughout the work. EDDs with the surface water data were provided online for download by the USEPA from the CFAC RI/FS project database.



### 3.6.1 Field Parameters

Field parameters measured during surface water sampling activities are provided on field datasheets included in Appendix C. The field parameter data were reviewed to evaluate any potential anomalies in general surface water chemistry that could potentially be influencing the surface water sampling results. No anomalies were noted and the field parameters measured appear to be consistent with values expected to occur in the natural environment. Field parameters will continue to be evaluated during future sampling rounds.

### 3.6.2 Surface Water Laboratory Data

Laboratory analytical data for the surface water samples collected from Site were evaluated to determine the presence, or lack thereof, of COPCs in Site surface water. Table 23 provides a statistical summary of the analytical results. This table identifies the frequency of detection; as well as the minimum, maximum and average detected concentrations, of each analyte in surface water. In addition, the statistical summary table provides the frequency that the measured concentration of each analyte in surface water exceeded the following human health screening criteria as noted in the RI/FS Work Plan and SAP:

- MDEQ Circular DEQ-7, Human Health Numeric Water Quality Standards (MDEQ, 2012);

- USEPA Drinking Water Maximum Contaminant Levels (USEPA, 2016); and
- USEPA Tapwater RSLs (USEPA, 2016).

In addition to comparisons to the human health screening criteria, statistical evaluation of the surface water data with respect to ecological screening criteria is provided within the SLERA. Additionally, it should be noted that similarly to as previously discussed with groundwater in Section 3.5, the USEPA Tapwater RSLs are conservative screening levels, such that for many analytes any detection in surface water results in an exceedance.

The evaluation of the statistical summary data compared to the human health screening criteria indicates the following about the Site-wide surface water conditions:

- Cyanide was detected in six sampling locations (27%) of surface water samples, including all three locations within the Backwater Seep Sampling Area (CFSWP-003, 004, and 005), one location in the Flathead River (CFSWP-006), one location in the South Percolation Ponds (CFSWP-020) and one location within Cedar Creek (CFSWP-015). Concentrations of total cyanide exceed the DEQ-7 Human Health Standard of 140 µg/L / USEPA MCL of 200 µg/L in two of three surface water samples from the Backwater Seep Sampling Area. Cyanide was not detected in any surface water samples collected within the Cedar Creek Reservoir Drainage Overflow Ditch and the Northern Surface Water Area.

- Fluoride was detected in 100% of the surface water samples, with no exceedances of the DEQ-7 Human Health Standard / USEPA MCL of 4,000 µg/L for fluoride in any surface water sample. Concentrations of fluoride exceed the USEPA Tapwater RSL of 80 µg/L in nine sample locations, including samples collected within the Backwater Seep Sampling Area, the South Percolation Ponds, the Northern Surface Water Area and one location within the Cedar Creek Reservoir Drainage Overflow Ditch.

- Metals that were observed in Site-wide soil samples and groundwater samples were sporadically detected in surface water Site-wide, with no exceedances of the DEQ-7 Human Health Standards / USEPA MCLs.

- VOCs, SVOCs, PCBs, and pesticides were analyzed as additional analyses on the three samples collected in the South Percolation Ponds in accordance with the RI/FS Work Plan. One VOC, methylene chloride, was detected in one sample below all screening levels. All samples had no detections of SVOCs, PCBs or pesticides. No surface water samples were collected in the North Percolation Ponds because no water was present during the sampling events.

Based on the statistical summary and a review of the surface water conditions, maps displaying data for cyanide, fluoride, and selected metals were created to visually evaluate the areal distribution and magnitude of exceedances of each compound. The various maps are provided in Appendix X. Note that the maps also include the MDEQ Circular DEQ-7, Chronic and Acute Aquatic Life Numeric Water Quality Standards (MDEQ, 2012) for reference. The sections below provide additional detail regarding the analytical results for the surface water samples.

#### 3.6.2.1 Cyanide and Fluoride

The distribution of cyanide and fluoride in surface water is shown in Appendix X, Plates X1 and X2. These data indicate the following:

- Cyanide was detected at concentrations exceeding the DEQ-7 Human Health Standard of 140 µg/L and the USEPA MCL of 200 µg/L at two locations in the Backwater Seep Sampling Area. Cyanide was detected in surface water sample CFSWP-004 with a concentration of 209 µg/L and at CFSWP-005 with a concentration of 213 µg/L. Outside of the Backwater Seep Sampling Area, the highest concentration of cyanide observed in surface water was at surface water sampling location CFSWP-020 (South Percolation Ponds) with a concentration of 12.5 µg/L. Cyanide was also detected in one surface water sample from Cedar Creek (CFSWP-015), with an estimated concentration of 2.3 µg/L and sample CFSWP-006 from the Flathead River with a concentration of with an estimated concentration of 3.2 µg/L. Cyanide was not detected in any of the upstream samples including CFSWP-014 (Cedar Creek), CFSWP-013 (Cedar Creek Reservoir Drainage Overflow Ditch) and CFSWP-017 (Flathead River).

- The maximum fluoride concentrations in surface water were observed in sampling locations CFSWP-004 and CFSWP-005 within the Backwater Seep Sampling Area, at concentrations of 2,560 and 2,570 µg/L respectively, which are less than the DEQ-7 Human Health Standard / USEPA MCL of 4000 µg/L. Outside of the Backwater Seep Sampling Area, the highest concentration of fluoride observed in surface water was at surface water sampling location CFSWP-019 (South Percolation Ponds) with a concentration of 379 µg/L. Fluoride was detected in all of the upstream samples including CFSWP-014 (Cedar Creek) at a concentration of 38.3 µg/L, CFSWP-013 (Cedar Creek Reservoir Drainage Overflow Ditch) at a concentration of 39.2 µg/L and CFSWP-017 (Flathead River) at a concentration of 56.2 µg/L.

#### 3.6.2.2 Metals

The distribution of metals frequently detected in surface water are shown in Appendix X, Plates X3 through X10. The metals in surface water data indicate the following:

- Similar to Site-wide groundwater, the most frequently detected metals include calcium, potassium, sodium, and magnesium in 100% of the samples, aluminum in 95% of the samples, and manganese in 68% of the samples.

- Concentrations of metals are below the DEQ-7 Human Health Standards / USEPA MCLs in all surface water samples.

#### 3.6.2.3 General Chemistry

General chemistry parameters including ammonia, chloride, hardness (as calcium carbonate), nitrate + nitrite (as nitrogen), orthophosphate (as phosphorus), and sulfate were measured in surface water samples to obtain data that could be utilized in chemical fate and transport evaluations and modeling, if needed in the future as part of the RI/FS. General chemistry results were also compared to the standards and RSLs where available. The general chemistry data indicate the following:

- Sulfate was detected in 100% of the surface water samples ranging from a minimum concentration of 1,900 µg/L to a maximum concentration of 18,100 µg/L, with the maximum concentration detected at sampling location CFSWP-004 within the Backwater Seep Sampling Area.

- Hardness as calcium carbonate was detected in 100% of the surface water samples ranging from a minimum concentration of 84,000 µg/L to a maximum concentration of 222,000 µg/L, with the maximum concentration detected at sampling location CFSWP-004 within the Backwater Seep Sampling Area.

- Chloride was detected in 100% of the surface water samples ranging from a minimum concentration of 335 µg/L to a maximum concentration of 3,060 µg/L, with the maximum concentration detected at sampling location CFSWP-004 within the Backwater Seep Sampling Area.

- Ammonia was detected in 18% of the surface water samples with a maximum concentration of 178 µg/L at sampling location CFSWP-018 within the South Percolation Ponds.

- Nitrate + nitrite (as nitrogen) was detected in 22% of the surface water samples, with a maximum concentration of 1,680 µg/L at sampling location CFSWP-005 within the Backwater Seep Sampling Area. Concentrations of Nitrate + nitrite (as nitrogen) did not exceed the DEQ-7 Human Health Standard / EPA MCL of 10,000 µg/L in any samples.

- Orthophosphate was not detected in surface water samples.



### 3.7 Sediment Quality

The following section provides a summary of sediment quality based on laboratory analytical data and field data that were generated during the Phase I Site Characterization. Data tables with sediment data generated during the work are provided in Appendix Y. Additionally, laboratory data reports were provided to the USEPA as separate submittals throughout the work. EDDs with the surface water data were provided online for download by the USEPA from the CFAC RI/FS project database.

Sediment analytical data were evaluated to determine the presence, or lack thereof, of COPCs in sediment. Table 24 provides a statistical summary of the analytical results for sediment. This table identifies the frequency of detections; as well as the minimum, maximum and average detected concentrations, of each analyte in sediment. In addition, the statistical summary tables provide the frequency that the measured concentration of each analyte in sediment exceeded the following human health screening criteria as noted in the RI/FS Work Plan and SAP:

- USEPA Residential Regional Screening Levels (USEPA, 2016); and
- USEPA Industrial Regional Screening Levels (USEPA, 2016).

Evaluation of the sediment data with respect to ecological screening criteria is provided within the SLERA. The evaluation of the statistical summary data relative to human health screening criteria indicates the following about the sediment conditions:

- Cyanide was detected in 11 out of 12 sediment samples. Cyanide concentrations did not exceed the USEPA Industrial RSL of 15 mg/kg in any sediment samples. Cyanide concentrations exceeded the USEPA Residential RSL of 2.3 mg/kg in two sediment samples; one within the North-East Percolation Pond (CFSDP-024) and one in the Backwater Seep Sampling Area (CFSDP-003).

- Fluoride was detected in 100% of sediment samples, but did not exceed the USEPA Residential or Industrial RSL in any of the sediment samples.

- SVOCs, (primarily PAHs) were detected at concentrations exceeding USEPA Industrial RSLs in sediment samples collected within both of the North Percolation Ponds. In addition to the North Percolation Ponds, PAHs were detected at concentrations exceeding USEPA Residential RSLs, with most frequent exceedances occurring in the Backwater Seep Sampling Area and the South Percolation Ponds.

- Metals were detected at concentrations exceeding USEPA Residential RSLs at 11 sediment sample locations. Aluminum concentrations exceeded the USEPA Industrial RSL of 110,000 mg/kg in one sediment sample in the North-East Percolation Pond (CFSDP-024). Arsenic concentrations exceeded the USEPA Industrial RSL in six sediment samples.

- PCBs and pesticides were not detected in any of the sediment samples collected during the Phase I Site Characterization.

Based on the statistical summary and a review of the sediment conditions, maps displaying data for cyanide, fluoride, selected PAHs, and selected metals were created to visually evaluate the areal distribution and magnitude of exceedances of each compound. The various maps are provided in Appendix Z. The sections below provide additional detail regarding the conditions of sediment samples.

### 3.7.1 Cyanide and Fluoride

The distribution of cyanide and fluoride in sediment is shown in Appendix Z, Plate Z1. These data indicate the following:

- Cyanide was detected within all sediment samples with the exception of CFSDP-006, located within the Flathead River. Although cyanide was detected in most sediment samples, cyanide concentrations are below the USEPA Residential RSL of 2.3 mg/kg in all samples, with the exception of one sample collected from within the North-East Percolation Pond (CFSDP-024 at 7.8 mg/kg) and one sample collected within the Backwater Seep Sampling Area (CFSDP-003 at 3.2 mg/kg).

- Fluoride was detected within 100% of sediment samples. Although fluoride was detected in all sediment samples, fluoride concentrations did not exceed the USEPA Residential or Industrial RSL (USEPA, 2016). The highest detection of fluoride was measured in sediment sample CFSDP-024 (North-East Percolation Pond) at 219 mg/kg.

### 3.7.2 PAHs

PAHs that were most frequently detected in sediment at concentrations exceeding USEPA RSLs are shown in Appendix Z, Plate Z2. These data indicate the following:

- One or more PAHs were detected in more than half of the sediment samples, with the most frequent detections in the North Percolation Ponds, the Backwater Seep Sampling Area, and the South Percolation Ponds.

- PAHs that were most frequently detected in sediment samples include benzo[a]pyrene, benzo[a]anthracene, benzo[b]fluoranthene, Dibenz(a,h)anthracene, and indeno[1,2,3-cd]pyrene.

- PAH concentrations were less than USEPA Residential RSLs within the three sediment samples collected within Cedar Creek, with the exception of benzo[a]pyrene, which exceeded the USEPA Residential RSL of 0.016 mg/kg at sampling locations CFSDP-015 (0.043 mg/kg) and CFSDP-016 (0.094 mg/kg).

- Concentrations of at least one or more PAHs exceeded USEPA Residential RSLs in the three samples collected within the South Percolation Ponds (CFSDP-018, 019 and 020) and one sample in the Backwater Seep Sampling Area (CFSDP-003).

- The two sediment samples that were collected within the North Percolation Ponds had concentrations of multiple PAHs that exceeded the USEPA Industrial RSLs, with the highest magnitude of exceedances typically within the North-East Percolation Pond.

### 3.7.3 Metals

Metals that were most frequently detected in sediment at concentrations exceeding USEPA RSLs are shown in Appendix Z, Plate Z3. These data indicate the following:

- Fourteen different metals were detected in every sediment sample collected during the Phase I Site Characterization. With the exception of arsenic, which was detected at concentrations exceeding USEPA Industrial RSLs in eight sediment samples, the only other metal that was detected at concentrations above USEPA Industrial RSLs was aluminum (one sediment sample within the North-East Percolation Pond [CFSDP-024]).
- With the exception of arsenic, metals including aluminum, cobalt, and iron were detected at concentrations exceeding USEPA Residential RSLs in ten or more of the sediment samples collected Site-wide.
- Thallium was detected at concentrations exceeding the USEPA Residential RSL of 0.078 mg/kg in both samples collected from the North-Percolation Ponds (CFSDP-023 and 024), but was not detected in any of the other sediment samples.



### 3.7.4 Total Organic Carbon

TOC was detected in all sediment samples. TOC results are provided in Appendix Y, Table Y5. The TOC concentrations ranged from a minimum of 4,130 mg/kg in sediment sample CFSDP-006 (Flathead River) to a maximum of 555,000 mg/kg in sediment sample CFSDP-023 (North-West Percolation Pond).

## 3.8 Laboratory Data Validation Summary of Findings

Approximately 51 laboratory sample delivery groups were submitted to Laboratory Data Consultants for review as part of the data validation process. The results of the data validation are summarized in data validation reports (Appendix H) produced by Laboratory Data Consultants. Data qualifiers added as a result of the data validation processes were imported to the CFAC RI/FS database and are included in the data summary tables in this Data Summary Report.

A review of the data validation reports was completed by Roux Associates to evaluate the completeness of the data in accordance with the Phase I SAP QA/QC procedures. Overall, approximately 130 analyses were rejected out of an estimated 135,000 analyses (Approximately 0.1%) performed as part of the investigation activities summarized in this Data Summary Report. This suggests that the overall data set generated during the work is usable and complete.

A summary of the data that was described in the data validation reports as rejected during the validation process is provided below. The analytical results that were rejected during data validation are not reliable and were thus excluded from the data evaluations described throughout this Data Summary Report.

**Soil Samples**

- Dieldrin was rejected in sample CFMW-023a-SO 0-0.5 due to MS/MSD percent recovery not within the QC limits.
- A number of compounds were rejected in CFSB-052-SO-0.5-2 due to surrogate 2,4,6-Tribromophenol percent recovery not within QC limits.
- 2,4-Dinitrophenol was rejected in CFMW-019a-SO-10-12 due to MS/MSD percent recovery not within QC limits.
- 2,4-Dinitrophenol was rejected in CFMW-022-SO-10-12 due to MS/MSD percent recovery not within QC limits.
- 1,4-Dioxane and 2,2'Oxybis(1-chloropropane) was rejected in CFMW-035-SO-0.5-2 due to MS/MSD percent recovery not within QC limits.
- A number of compounds were rejected in CFSB-130-SO-0.5-2 due to surrogate for 2,4,6-Tribromophenol percent recovery not within QC limits.
- 2,4-Dinitrophenol was rejected in CFMW-011a-SO-10-12 due to MS/MSD percent recovery not within QC limits.
- 1,4-Dioxane and 2,4-Dinitrophenol were rejected in CFMW-028a-S0-0.5-2 due to MS/MSD percent recovery not within QC limits.
- 2,4-Dinitrophenol was rejected in CFMW-025a-SO-10-12MS/MSD due to MS/MSD percent recovery not within QC limits.
- 2,4-Dinitrophenol was rejected in CFISS-027-SO-0.5-2 due to MS/MSD percent recovery not within QC limits.
- 2,4-Dinitrophenol was rejected in CFMW-056a-SO-10-12 due to MS/MSD percent recovery not within QC limits.
- 2,4-Dinitrophenol was rejected in CFMW-053a-SO-10-12 due to MS/MSD percent recovery not within QC limits.
- 3,3'-Dichlorobenzidine was rejected in CFTP-23-SO-0-0.5 due to MS/MS percent recovery not within QC limits.

- 2,4-Dinitrophenol was rejected in CFSDP-013-SO due to MS/MSD percent recovery not within QC limits.
- Total cyanide was rejected in CFDS-003-SO-2-3 due to MS/MSD percent recovery not within QC limits.
- All VOCs with the exception of acetone and methylene chloride were rejected in CFSB-102-SO-10-12 due to holding time exceedance greater than 2x the limit.

**Groundwater samples**

- Pentachlorophenol was rejected in 18 samples because laboratory control samples percent recovery was not within QC limits.
- Orthophosphate was rejected in 11 samples due to MS/MSD percent recovery not within QC limits.

**Surface water samples**

- Orthophosphate was rejected in five samples due to MS/MSD percent recovery not within QC limits.



### 3.9 Investigation Derived Waste Disposal

During drilling activities, eight 20-yard roll-off containers and two 55-gallon drums of soil investigation derived waste (IDW) were generated. The soil IDW was managed onsite by Cascade and Roux Associates throughout the Phase I Site Characterization in accordance with the Investigation Derived Waste Management Plan (IDW Management Plan) dated May 9, 2016 (Roux, 2016c).

Each container of soil was sampled by Roux Associates in accordance with the IDW Management Plan to evaluate the waste characteristics for disposal. Sampling results indicated that all soil IDW was non-hazardous. Sample results were provided to USEPA for review prior to disposal. Additionally, in accordance with paragraph 43b of the AOC, sample results were provided to the Washington Department of Ecology state environmental official.

The soil IDW was shipped offsite for disposal in eight shipments (The soil IDW stored in the two 55-gallon drums were combined with the other eight roll-off containers), beginning on August 17, 2016 and completed on September 30, 2016. The IDW was transported by Cascade to Waste Management Graham Road Landfill in Medical Lake, Washington for disposal. Waste shipments were documented on non-hazardous waste manifests, which are included in Appendix AA for reference.

Water IDW that was generated during monitoring well development and the first round of groundwater sampling is managed onsite in accordance with the IDW Management Plan. Prior to disposal, water IDW will be sampled to evaluate waste characteristics and results will be provided to USEPA for review.

## 4.0 SUMMARY OF FINDINGS AND CONCEPTUAL SITE MODEL (CSM) REVIEW

An initial evaluation of Site conditions based on prior investigations formed the basis for development of a preliminary CSM presented in the RI/FS Work Plan. The preliminary CSM included discussion of potential COPCs and potential source areas, as well as potential COPC migration and exposure pathways. As stated in the RI/FS Work Plan, the Conceptual Site Model will be updated on an ongoing basis throughout the performance of the RI/FS. The sections below provide an updated discussion of the CSM based upon the Phase I Site Characterization data and findings that were presented throughout Section 3 of this Data Summary Report. The discussion provides further evaluation of potential source areas and the types of COPCs found; and, further evaluation of COPC migration from the source areas through the various environmental media at the Site.



### 4.1 Discussion of Potential Source Areas and COPCs

The preliminary CSM identified the following site features as potential source areas:

- Landfills (including the closed Wet Scrubber Sludge Pond and the closed leachate ponds);
- Former Drum storage area;
- Percolation ponds;
- Waste and raw materials storage and handling areas;
- Plant drainage system including drywells and associated discharge points; and
- USTs and ASTs.

A discussion of the Phase I Site Characterization results relative each of the above areas is provided below.

#### 4.1.1 Landfills

The preliminary CSM presented in the RI/FS Work Plan had identified the landfills, in general, as a potential source area for cyanide and fluoride, and potentially other COPCs. Plates 15 and 16 show contours of cyanide and fluoride concentrations, respectively, in groundwater based upon the results of the September 2016 sampling event. The area of elevated cyanide and fluoride concentrations in groundwater within the upper hydrogeologic unit appears to originate immediately to the west of Wet Scrubber Sludge Pond; where concentrations of both cyanide and fluoride exceed 5,000 µg/L. Based upon the southwest groundwater flow direction beneath this area of the Site (Plates 11 and 12) this area of maximum concentrations is immediately downgradient of the West Landfill and Wet Scrubber Sludge Pond. This indicates that these Site features are the primary source of the elevated cyanide and fluoride concentrations in groundwater, which would be consistent with the historical use of these features as disposal locations for wastes containing cyanide and fluoride (i.e., cyanide in SPL disposed in the West Landfill; and fluoride within the calcium fluoride sludge disposed in Wet Scrubber Sludge Pond), as well as with current understanding that both of these landfill are unlined. In addition, the engineered clay cap over the West Landfill was not installed until 1995.



As shown in Plates 15 and 16, the cyanide and fluoride concentrations in groundwater to the east and northeast of the West Landfill and Wet Scrubber Sludge Pond, and immediately downgradient of former Sanitary Landfill, Center Landfill and East Landfill (and its associated leachate ponds), are orders of magnitude lower than those described above. The maximum cyanide concentration in groundwater immediately downgradient of these features was 2.9 µg/L in monitoring well CFMW-20, which is similar to the 2.4 µg/L in background monitoring well CFMW-001. These findings suggest that the Sanitary, Center and East Landfills are not contributing sources to the cyanide and fluoride in groundwater.

As discussed previously in Section 3.3.2.2, groundwater elevations were monitored using pressure transducers in monitoring wells. Adjacent to the West Landfill, groundwater elevations in the upper hydrogeologic unit can fluctuate more than 50 feet seasonally. This indicates that there is the potential for groundwater to rise above the base of the West Landfill. Groundwater elevation fluctuations will continue to be monitored and will be further evaluated.

Soil samples collected from locations immediately adjacent to the landfill contained concentrations of COPCs; including cyanide, fluoride and PAHs. However, with exception of the former Drum Storage Area discussed below, the concentrations of these COPCs in soil adjacent to the landfills were generally similar to or less than those observed in other areas of the Site, such as the Operational Area or around the Main Plant. Based upon similarity of concentrations to other Site areas, and the site reconnaissance documenting established vegetative covers across the landfills; it does not appear that the landfills in their current state are the source of the COPCs detected in soil.  Instead, the soils around the landfills have likely been impacted by the historical waste handling practices around the landfills and by aerial deposition of COPCs from historical plant emissions.

### 4.1.2 Former Drum Storage Area

The preliminary CSM presented in the RI/FS Work Plan discussed and identified the Former Drum Storage Area located immediately to the west of the Wet Scrubber Sludge Pond as a potential source area.  As shown in Plate 15, monitoring well CFMW-10 in the center of the Former Drum Storage Area contained the highest concentration of cyanide (7,320 µg/L) during the September 2016 sampling event.  In addition, the incremental soil samples from DUs designated CFISS-001 through CFISS-003 contained cyanide at concentrations ranging from 8.5 to 29 mg/kg.  CFISS-001 and 002 correspond to the Former Drum Storage Area, and CFISS-003 is located immediately to the south of the area.  As shown in Plate N8, these were only three DUs in the Operational Area where cyanide and fluoride exceeded the USEPA Residential and/or Industrial RSLs during the Phase I Site Characterization.  Based upon these findings, the Former Drum Storage Area may also be a contributing source to the elevated cyanide and fluoride concentrations that appear to originate beneath this area and the West Landfill and Wet Scrubber Sludge Pond Landfill.



### 4.1.3 Percolation Ponds

The percolation ponds were identified as potential sources within the preliminary CSM in the RI/FS Work Plan due to their use as waste water discharge locations and based upon the prior sampling conducted during the USEPA Site Reassessment in 2013 (Weston Solutions, Inc., 2014).  The results of the Phase I Site Characterization indicate the Northeast Pond and its influent ditch typically contained the among the highest concentrations of cyanide and PAHs in the soil and sediment, followed by the effluent ditch, the Northwest Pond and the West Pond.

The concentrations of COPCs decrease with increasing depth beneath the ponds.  Beneath the Northwest Percolation Pond and West Percolation Pond, there are few or no exceedances of the Residential RSLs in the 10 – 12 ft-bls depth interval; however, beneath the Northeast Percolation

Pond and ditches there still are PAHs exceeding the USEPA Industrial RSLs at the 10 – 12 ft-bls depth.

The Northeast Percolation Pond and West Percolation Pond are located hydraulically downgradient of the West Landfill and Wet Scrubber Sludge Pond source area described above. As shown Plates 15 and 16, the concentrations of cyanide and fluoride in groundwater downgradient (south) of the Northeast Percolation Pond and West Percolation Pond are less than those measured in wells upgradient of the ponds. This continued decrease in concentrations as groundwater flows beneath the ponds suggests that, currently, the ponds are not a significant source of the cyanide and fluoride concentrations observed in groundwater (i.e., if the ponds were a significant source, an increase in cyanide and fluoride concentrations would be expected).

Additionally, SVOC's (i.e., common coal tar pitch and petroleum coke constituents) were not detected in any groundwater monitoring wells immediately down-gradient from the Northwest Percolation Pond or the Northeast percolation pond (CFMW-025b, CFMW-26, and CFMW-028). This suggests these two percolation ponds effectively prevent migration of SVOC's from the ponds to the groundwater.

In the South Percolation Ponds, similar COPCs were detected; however, the concentrations were generally much lower than those observed in the Northern Ponds.

#### 4.1.4 Main Plant/Materials Storage and Handling Areas/Plant Drainage System/USTs/ASTs

The various areas where waste and raw materials were stored and handled during historical Site operations, as well as the plant drainage system and various USTs and ASTs located on the north side of the Main Plant were identified as potential source areas within the preliminary CSM. There had been no prior soil sampling with these various areas during prior Site investigations. As part of the Phase I Site Characterization, soil samples and groundwater samples were collected from numerous locations surrounding the Main Plant and Paste Plant, including locations where waste and raw materials were stored or handled, in four drywells/drainage structures adjacent to the Main Plant building, and in locations adjacent to ASTs and USTs located north of the Main Plant building. The sampling in the Main Plant area also included along rail sidings that accessed the Site, the Rod Mill to the southwest of the Main Plant, and the Operational Area located to the north, between the Main Plant and landfill area.

The findings from the Phase I Site Characterization indicate that concentrations of cyanide and fluoride in soil were detected throughout the aforementioned areas. However, the concentrations were below USEPA Industrial RSLs at all locations and Residential RSLs at all locations with the exception of two locations: cyanide was present above the USEPA Residential RSL in soil boring CFSF-131, beneath the former cathode soaking pit located slightly inside the northern extent of the Main Plant building; and, fluoride was detected in soil boring CFSB-066 on the east side of the Main Plant at concentration exceeding the USEPA Residential RSLs.

PAHs exceed USEPA Industrial RSLs in surface soil and shallow soil across the majority of the area (including the materials handling areas and all sampled drainage structures) surrounding both the Main Plant and Paste Plant, and across the Operational Area. The widespread distribution of PAHs is attributed to the extensive handling and storage of PAH containing materials, such as petroleum coke and pitch, that were key components of the manufacturing process; as well as the aerial deposition of PAHs from historical plant emissions. The PAH concentrations decreased with depth, but still exceeded USEPA Residential RSLs in samples from the 10 – 12 ft-bls depth at the majority of locations to the north, east and south of the Main Plant. PAHs typically decreased to below USEPA Residential RSLs or to non-detect at locations to the west.



PAH concentrations typically did not exceed USEPA Industrial RSLs in the surface soil samples collected at the former Rod Mill to the southwest of the Main Plant area; and, decreased to below USEPA Residential RSLs or to non-detect in the deeper samples.

#### 4.1.5 Discussion of COPCs

As described above, cyanide, fluoride and PAHs are primary COPCs found within the various source areas and/or Site features investigated during the Phase I Site Characterization. These findings are consistent with the preliminary CSM presented in the RI/FS Work Plan. However, the Phase I program included a broad suite of analyses to determine if any other COPCs are present at the Site. A discussion of the findings with respect to other COPCs is provided below.

Actual identification of which COPCs will be retained for further evaluation in the risk assessment process and included in the Phase II Site Characterization program will occur during development of the Baseline Risk Assessment Work Plan (BRAWP) and the Phase II Site Characterization Sampling and Analysis Plan.

The cyanide concentrations measured in all media at the Site in the Phase I Site Characterization were based upon a total cyanide analysis; however, the screening levels developed by the USEPA and utilized in the risk assessment process are based upon exposure to free cyanide. Prior studies of spent pot liner leachate have documented that cyanide at aluminum smelter sites exists primarily in the form of iron-cyanide complexes (Dzombak et al, 2005). Typically, ferrocyanide and ferricyanide are more stable in the environment (tend not to release free cyanide and are less bioavailable). Thus, any potential for effects due to cyanide exposure is likely overestimated, as free cyanide would only comprise a fraction, if any, of the total cyanide present. Free cyanide analysis will be included in future sampling events to address this uncertainty and allow for more accurate assessment of potential risks.



#### 4.1.5.1 VOCs

VOCs were frequently detected in soil samples across the Site. Acetone was detected in over 95% of the soil samples and four petroleum related VOCs (benzene, toluene, ethylbenzene, and xylenes [BTEX]) were detected in 34% of the soil samples. However, no VOC concentrations exceeded USEPA Industrial or Residential RSLs in any of the soil samples collected during the Phase I Site Characterization. There is no known source of acetone at the Site. The widespread occurrence of acetone in soil was discussed with TestAmerica laboratory, and it was suggested that the low levels of acetone detected in soil samples may be a result of the sodium bisulfate preservative reacting with organic material in the sample. The widespread distribution of petroleum VOCs across the Site is somewhat similar to that of PAHs. The frequent detection of petroleum related VOCs at trace levels in soil is likely attributed to the presence of these VOCs, albeit at low concentrations, in the petroleum coke and pitch materials that were used in manufacturing at the Site and were the primary sources of PAHs at the Site.

Although there were frequent detections of VOCs in soil, they were found infrequently in groundwater at the Site. For example, acetone was detected in only 5% of the samples and

BTEX in only 3%. In addition, there were no detections of VOCs at concentrations exceeding USEPA Tap Water RSSLs. Collectively, these findings suggest that VOCs do not need to be retained as COPC; however, this will be further evaluated during preparation of BRAWP.

#### 4.1.5.2 Metals

The Site-wide soil data indicate that metals were frequently detected in soil samples collected Site-wide (more than ten metal analytes were detected in 100% of the samples). The detection of metals is expected due to natural occurrence in the environment. The concentrations of metals were typically below USEPA Industrial RSLs, with the exception of arsenic at most locations. Multiple metals including aluminum, iron, cobalt, manganese, and thallium were detected at concentrations exceeding the USEPA Residential RSLs.

The results of the background sampling and statistical data analysis indicate that many of the metal concentrations observed in soil samples are likely a result of metals present at background concentrations. However, the areal distribution of metal detections and the magnitude of metal concentrations around certain Site features indicate that some metals may also be present as a result of the former operations. For example, select metals are present in higher concentrations within the North Percolation Ponds and ditch connecting the two ponds when compared to the other areas of the Site. The determination of which metals should be retained as COPCs for subsequent phases of the RI and the risk assessment will be made based upon data evaluation during preparation of the BRAWP.

#### 4.1.5.3 Pesticides and PCBs

The Site-wide soil data for pesticides and PCBs indicated no detections of either set of compounds in any of the Site-wide soil samples. These data indicate that PCBs and pesticides are not likely a contaminant of concern in soil Site-wide. However, PCBs were detected in four areas of the Operational Area, DUs designated CFISS-013, 020 and 022. These DUs are generally located within the central portion of the Operational Area. PCBs in these localized areas will be further evaluated in preparation of the BRAWP and Phase 2 Site Characterization SAP.

#### 4.1.5.4 Dioxins and Dibenzofurans

The Phase I Site Characterization program included analysis for dioxins and dibenzofurans in soil samples collected from the Rectifier Yards located on south side of the Main Plant. These analyses were specified due to this historical occurrence of transformer fires within these areas and the potential for these compounds to be generated as combustion by-products from PCBs. Although dioxin and dibenzofuran type compounds were detected, the evaluations indicate that none of the concentration exceed the calculated USEPA Residential or Industrial RSLs at any sampling interval. These findings suggest that dioxins and dibenzofurans do not need to be retained as COPC; however, this will be further evaluated during preparation of BRAWP.



## 4.2 Migration of COPCs from Source Areas

The following sections describe the migration pathways for COPCs from the source areas at the Site based upon the findings of the Phase I Site Characterization for the following environmental media:

- Groundwater;
- Surface water and sediments; and
- Soil vapor.

### 4.2.1 Groundwater

Cyanide and fluoride are the primary COPCs in groundwater at the Site based on the evaluation of the data collected during the Phase I Site Characterization and historical data. This finding is consistent with the preliminary CSM presented in the RI/FS Work Plan. As described above, the West Landfill and Wet Scrubber Sludge Pond and, potentially the Former Drum Storage Area located immediately west of those features, appear to be the primary sources of the cyanide and fluoride in groundwater.

As shown in Plates 15 and 16, the elevated concentrations of cyanide and fluoride appear to be present within groundwater that originates in the West Landfill/Wet Scrubber Sludge Pond area and generally migrates southward, in the upper hydrogeologic unit, towards the Flathead River. Cyanide concentrations above 200 µg/L (USEPA MCL) extend as far south as the Flathead River (Plate 15). These concentrations of cyanide are consistent with similarly observed concentrations of cyanide in surface water from the Backwater Seep Sampling Area of the Flathead River, which is a location where groundwater is expressed from the upper hydrogeologic unit to the Flathead River.

Cyanide and fluoride concentrations measured in monitoring wells outside of the contours shown on Plates 15 and 16 are less than half of the MCL. The measured concentrations are below the reporting limit or non-detect in the north, west and southwest portions of the Site (e.g., near Aluminum City). The data support that migration of the cyanide and fluoride follows the southerly groundwater flow patterns in the upper hydrogeologic unit as depicted in Plates 11 and 12, and is not in the direction towards Aluminum City. The monitoring wells located along the southwest boundary closest to Aluminum City are non-detect for cyanide. CFAC has been conducting quarterly sampling of residential wells in Aluminum City since June 2015. All of the data from this sampling effort continues to indicate that impacted groundwater has not migrated beneath the residential areas and is not migrating in that direction.

The cyanide and fluoride contour maps (Plates 15 and 16, respectively) were also utilized to evaluate groundwater quality conditions upgradient and downgradient of the Main Plant Area and the North Percolation Ponds. The data indicates that groundwater quality is similar, or concentrations decrease, in wells that are downgradient of the Main Plant and the North Percolation Ponds. The contour maps indicate no increase in concentration along the flow path that would be clearly indicative of potential contributions from secondary source areas downgradient of the landfill.



The cyanide and fluoride concentrations in groundwater decrease with depth within the upper hydrogeologic unit, as shown in nested monitoring wells that are screened at varying depths within the upper hydrogeologic unit. Concentrations were generally non-detect in monitoring wells screened below the upper hydrogeologic unit. These non-detect findings indicate there is limited vertical migration and that the cyanide and fluoride are primarily migrating horizontally within the upper hydrogeologic unit. These findings are consistent with observed hydrogeologic conditions described in Section 3.3.2.1, which indicate that there is only limited, if any, hydraulic connectivity between the upper hydrogeologic unit and the water bearing zones screened in the underlying glacial till.

Many of the metals that were detected in soil samples were either non-detect or present at very low concentrations in groundwater. However, groundwater sampling results for metals such as aluminum, arsenic, cobalt, iron, and lead indicate detections or greater magnitude of concentrations within the same monitoring wells where the highest measured concentrations of cyanide and fluoride were observed (i.e., those wells immediately downgradient of the West Landfill / Wet Scrubber Sludge Pond). The occurrence of metals in groundwater at these locations indicates that these metals are likely attributable to same source as the cyanide and fluoride. However, the elevated concentrations of metals in groundwater are generally limited to the three or four wells located immediately downgradient of the landfills and typically do not extend in the southern direction like the dissolved cyanide or fluoride.

As discussed above, PAHs were detected frequently in Site-wide soils at the Site. Where PAHs were detected in soil, the concentrations in soil exceeded the USEPA Protection of Groundwater risk based soil screening levels, suggesting a potential for impact to groundwater. However, PAHs were non-detect in all groundwater samples. This finding is attributed to inherent lack of dissolved-phase mobility that is common for PAHs to their low solubility and high carbon-octanol partition coefficients; which results in PAHs typically being tightly bound to soils. In addition, the complete absence of PAHs in groundwater despite the widespread exceedances of the Groundwater RSLs is reflective of the conservative nature of the RSLs. The extensive groundwater data generated during the Phase I Site Characterization provides a more direct measure of the potential mobility of PAHs at the Site. These findings indicate that the PAHs observed in soil are not impacting groundwater quality.



The preliminary CSM presented in the RI/FS Work Plan indicated that Cedar Creek and the Cedar Creek Reservoir Drainage Overflow were not likely discharge points for groundwater beneath the Site. During the Phase I Site Characterization, the stream bed elevations were confirmed to be more than 70 ft above the water table within the upper hydrogeologic unit; and, surface water discharge was confirmed to decrease along the flow path of each stream. These findings indicate both the Cedar Creek and the Cedar Creek Reservoir Drainage Overflow are losing streams; and thus, are not groundwater discharge locations. The fact that the Cedar Creek Reservoir Drainage Overflow loses water as it flows directly adjacent to the West Landfill and Wet Scrubber Sludge Pond is something that may warrant further examination to determine if water losses from the Overflow channel in this area could potentially be contributing to the observed contaminant migration in groundwater from these source areas.

### 4.2.2 Surface Water and Sediments

The preliminary CSM in RI/FS Work Plan indicated that groundwater seepage and the migration of water from South Percolation Ponds (located adjacent to the Flathead River within the 100 year flood plain) could potentially impact surface water, sediment, sediment porewater and biota within the Flathead River. Prior Site investigations have identified that the Backwater Seep Sampling Area, described as a backwater area of the Flathead River, is a location where groundwater is expressed. Historical sampling in the Backwater Seep Sampling Area has shown the surface water to contain cyanide and fluoride at concentrations exceeding USEPA MCLs and DEQ-7 Water Quality Standards. The preliminary CSM and historical data for the Backwater Seep Sampling Area were confirmed based upon the results of the Phase I Site Characterization.



The surface water samples collected in the South Percolation Ponds during the Phase I Site Characterization contained cyanide and fluoride at maximum concentrations of 12.5 µg/L and 379 µg/L, respectively. Cyanide and fluoride have historically been found at similar concentrations in the MPDES permitted discharge located at the west end of the South Ponds, indicating that the discharge from the outfall can be a source of the cyanide and fluoride in the South Ponds. However, cyanide has not been detected in the discharge to the South Ponds since October 2015. This suggests that cyanide observed in the South Ponds may be attributable to groundwater seepage into to the South Ponds; which is possible based upon groundwater flow, comparison of groundwater and surface water elevations, and the documented extent of cyanide and fluoride in groundwater. The water level in the South Percolation Ponds has been observed to correlate closely with surface water elevations in the Flathead River; indicating a hydraulic connection between the two water bodies and corresponding potential for impacted surface water within the South Ponds to migrate to the river.

The Phase I Site Characterization included collection of surface water samples from the Flathead River at nine locations distributed along the reach of the river that forms the southern boundary of the Site, including a location immediately upgradient of the Site boundary (east of the Site), locations adjacent to the Site and the South Percolation Ponds, and locations downgradient (west) of the Backwater Seep Sampling Area within the Site boundary. All of these surface water samples were either non-detect or below all screening levels for both cyanide and fluoride. These findings indicate that cyanide and fluoride found in groundwater, as well as in the surface water within Backwater Seep Sampling Area and the South Percolation Ponds, are not impacting surface water quality within the main channel of the Flathead River. Further evaluation of the surface water results within the Flathead River will be provided in the SLERA Summary Report being submitted under separate cover.

Sediment was not observed at most sampling locations within the Flathead River. This is due to fast flowing nature of the river which precludes the deposition and accumulation of any fined grained deposits within the river. The only exceptions to this were in the Backwater Seep Sampling Area, which is a quiescent backwater water area where fines can settle and accumulate; and a small distributary located south of the South Percolation Ponds. Evaluation of the sediment sampling results from these areas will be provided in the SLERA Summary Report being submitted under separate cover.



Cedar Creek and the Cedar Creek Reservoir Overflow are surface water features at the Site that are also addressed in the preliminary CSM in the RI/FS Work Plan. As described previously in Section 4.2.1, the results of the Phase I Site Characterization have confirmed that neither of these surface water features are groundwater discharge locations.

As documented in the preliminary CSM, the flat topography that exists within one-half mile of Cedar Creek, suggests there is little potential for overland transport of Site-related contaminants into Cedar Creek. However, in 2013 cyanide was detected in Cedar Creek surface water near the location of current sample CFSW-15 (Plate 5) at concentrations exceeding USEPA RSLs and DEQ-7 water quality standards. The surface water sample collected from this location during the September 2016 sampling event contained cyanide at a similar concentration. As this condition is inconsistent with the initial CSM, an additional sample was collected from a location slightly upstream as part of the Round 2 sampling event completed in December 2016 in an effort to identify the source. Sampling results from December 2016 will be provided in future Progress Reports.

Further evaluation of the surface water and sediment/soil sampling results from the Cedar Creek and the Cedar Creek Overflow Drainage will be provided in the SLERA Summary Report being submitted under separate cover.

#### 4.2.3 Soil Vapor

The preliminary CSM indicted there was low potential for soil vapor concerns at the Site based upon the limited detections of VOCs, and the low concentrations detected in groundwater during prior investigations. As described previously in Section 4.1, the VOC low concentrations detected in soil and groundwater during the Phase I Site Characterization appear to confirm the preliminary CSM. In order to further assess the potential for soil vapor intrusion, the maximum concentrations of each VOC detected in groundwater within the upper hydrogeologic unit were entered into the USEPA Vapor Intrusion Screening Level (VISL) Groundwater Concentration to Indoor Air Concentration (GWC-IAC) Calculator Version 3.5.1 (USEPA, 2016), as presented in Appendix U. The results indicate that all estimated vapor intrusion carcinogenic risks were less than 1E-6 and all hazard quotients were less than 1, confirming that the vapor intrusion pathway should not require further evaluation. As noted above, final screening and selection of COPCs and exposure pathways for further evaluation in the RI will take place during development of the BRAWP.

Respectfully submitted,

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## TABLES

| Notes Utilized Throughout Tables and Appendices | |
|---|---|
| **DEQ-7 Human Health Standards** | Montana Department of Environmental Quality- DEQ Circular 7 Human Health Standards |
| **EPA** | United States Environmental Protection Agency |
| **EPA Drinking MCL** | United States Environmental Protection Agency Risk Based Screening Level Drinking Water MCL |
| **EPA Tapwater RSL** | United StatesEnvironmental Protection Agency Risk Based Screening Level Tapwater RSL |
| **Industrial RSL** | United States Environmental Protection Agency Industrial Soil Regional Screening Level |
| **Rediential RSL** | United States Environmental Protection Agency Residnetial Soil Regional Screening Level |
| **Risk SSL** | United States Environmental Protection Agency Human Health Protection of Ground Water - Risk-based Soil Screening Level |
| **DUP** | Duplicate sample |
| **ft-bls** | Feet Below Land Surface |
| **ft-btoc** | Feet Below Top of Casing |
| **ft-amsl** | Feet Above Mean Sea Level |
| **LOD** | Limit of Detection |
| **MBSI** | Montana Background Soils Investigation |
| **n.d** | Non Detect |
| **NA** | Compound was not analyzed by laboratory |
| **TEF Value** | Toxic equivalence factors |
| **UCL** | Upper Confidence Limit |
| **UTL** | Upper Tolerance Limit |
| **µg/kg** | Micrograms per Kilograms |
| **g/cc** | Grams per cubic centimeter |
| **mg/kg** | Milligrams per kilogram |
| **% LEL** | % Lower explosive limit |
| **ppm** | Parts per million |
| **pg/g** | Picogram per gram |
| **J-** | Estimated Low Bias |
| **J** | Estimated value |
| **J+** | J+ -Estimated High Bias |
| **R** | Result is Rejected |
| **U** | Indicates that analyte was not detected at the limit reported |

**Table 1. Summary of Soil Samples Collected During Phase I Site Characterization**
**Columbia Falls Aluminum Company, Phase I Site Characterization, 2000 Aluminum Drive, Columbia Falls, MT**

| Location ID | Date Sampled | Surface (0-0.5 ft bls) | Shallow (0.5-2 ft bls) | Intermediate - Depth (10-12 ft bls) | Below Water Table | Surface (0-0.5 ft bls) Lead Only | Notes |
|---|---|---|---|---|---|---|---|
| CFMW-010 | 5/18/2016 | X | X | X | | X | |
| CFMW-029 | 5/18/2016 | X | X | X | | | |
| CFSB-120 | 5/18/2016 | X | X | X | | | |
| CFSB-121 | 5/18/2016 | X | X | X | | | |
| CFSB-125 | 5/18/2016 | X | X | X | | | |
| CFSB-126 | 5/18/2016 | X | X | X | | | |
| CFSB-127 | 5/18/2016 | X | X | X | | | |
| CFMW-018 | 5/19/2016 | X | X | X | | | |
| CFSB-011 | 5/19/2016 | X | X | X | | | |
| CFSB-013 | 5/19/2016 | X | X | X | | | |
| CFSB-122 | 5/19/2016 | X | X | X | | | |
| CFSB-123 | 5/19/2016 | X | X | X | | | |
| CFSB-124 | 5/19/2016 | X | X | X | | | |
| CFMW-012a | 5/20/2016 | X | X | X | X | X | |
| CFSB-040 | 5/20/2016 | X | X | X | | | |
| CFSB-042 | 5/20/2016 | X | X | X | | | |
| CFSB-044 | 5/20/2016 | X | X | X | | | |
| CFSB-046 | 5/20/2016 | X | X | X | | | |
| CFSB-048 | 5/20/2016 | X | X | X | | | |
| CFSB-052 | 5/20/2016 | | X | X | | | No surface sample collected -concrete surface from 0-0.5 ft bls |
| CFSB-010 | 5/21/2016 | | X | X | | | No surface sample collected -asphalt surface from 0-0.5 ft bls |
| CFSB-038 | 5/21/2016 | X | X | X | | | |
| CFSB-045 | 5/21/2016 | X | X | X | | | |
| CFSB-050 | 5/21/2016 | X | X | X | | | |
| CFSB-051 | 5/21/2016 | X | X | X | | | |
| CFSB-006 | 5/23/2016 | X | X | X | | | |
| CFSB-008 | 5/23/2016 | X | X | X | | | |
| CFSB-009 | 5/23/2016 | X | X | X | | | |
| CFSB-021 | 5/23/2016 | X | X | X | | | |
| CFSB-022 | 5/23/2016 | X | X | X | | | |
| CFSB-029 | 5/23/2016 | X | X | X | | | |
| CFSB-033 | 5/23/2016 | X | X | X | | | |
| CFSB-094 | 5/24/2016 | X | X | X | | | |
| CFSB-095 | 5/24/2016 | X | X | X | | | |
| CFSB-097 | 5/24/2016 | X | X | X | | | |
| CFSB-098 | 5/24/2016 | X | X | X | | | |
| CFSB-099 | 5/24/2016 | X | X | X | | | |
| CFSB-100 | 5/24/2016 | X | X | X | | | |
| CFSB-128 | 5/24/2016 | X | X | X | | | |
| CFSB-129 | 5/24/2016 | X | X | X | | | |
| CFMW-019a | 5/25/2016 | X | X | X | | | Below water table sample not collected due to no recovery in sample interval |
| CFSB-001 | 5/25/2016 | X | X | X | | | |
| CFSB-002 | 5/25/2016 | X | X | X | | | |
| CFSB-003 | 5/25/2016 | X | X | X | | | |
| CFSB-004 | 5/25/2016 | X | X | X | | | |
| CFSB-005 | 5/25/2016 | X | X | X | | | |
| CFSB-007 | 5/25/2016 | X | X | X | | | |
| CFSB-086 | 5/26/2016 | X | X | X | | | |
| CFSB-087 | 5/26/2016 | X | X | X | | | |
| CFSB-088 | 5/26/2016 | X | X | X | | | |
| CFSB-092 | 5/26/2016 | X | X | X | | | |
| CFSB-060 | 5/27/2016 | X | X | X | | | |
| CFSB-066 | 5/27/2016 | X | X | X | | | |
| CFSB-068 | 5/27/2016 | | X | X | | | No surface sample collected -asphalt surface from 0-0.5 ft bls |
| CFSB-071 | 5/27/2016 | X | X | X | | | |
| CFSB-084 | 5/27/2016 | X | X | X | | | |
| CFSB-012 | 5/28/2016 | | X | X | | | No surface sample collected -asphalt surface from 0-0.5 ft bls |
| CFSB-049 | 5/28/2016 | | X | X | | | No surface sample collected -asphalt surface from 0-0.5 ft bls |
| CFSB-054 | 5/28/2016 | X | X | X | | | |
| CFSB-055 | 5/28/2016 | X | X | X | | | |
| CFSB-057 | 5/28/2016 | X | X | X | | | |
| CFSB-059 | 5/28/2016 | X | X | X | | | |
| CFMW-003a | 5/31/2016 | X | X | X | | | |
| CFMW-034 | 5/31/2016 | X | X | X | | | |
| CFSB-034 | 5/31/2016 | X | X | X | | | |
| CFSB-035 | 5/31/2016 | X | X | X | | | |
| CFSB-036 | 5/31/2016 | X | X | X | | | |
| CFSB-037 | 5/31/2016 | X | X | X | | | |
| CFSB-053 | 5/31/2016 | | X | X | | | No surface sample collected -asphalt surface from 0-0.5 ft bls |
| CFMW-035 | 6/1/2016 | X | X | X | | | |
| CFSB-073 | 6/1/2016 | X | X | X | | | |
| CFSB-074 | 6/1/2016 | X | X | X | | | |
| CFSB-075 | 6/1/2016 | X | X | X | | | |
| CFSB-079 | 6/1/2016 | X | X | X | | | |
| CFSB-080 | 6/1/2016 | X | X | X | | | |
| CFSB-082 | 6/1/2016 | X | X | X | | | |
| CFMW-003a | 6/2/2016 | | | | X | | Below Water Table collected 23-28 ft bls |
| CFMW-022 | 6/2/2016 | X | X | X | | X | |
| CFSB-014 | 6/2/2016 | X | X | X | | | |
| CFSB-016 | 6/2/2016 | X | X | X | | | |
| CFSB-062 | 6/2/2016 | X | X | X | | | |
| CFSB-065 | 6/2/2016 | X | X | X | | | |
| CFSB-064 | 6/3/2016 | X | X | X | | | |
| CFSB-132 | 6/3/2016 | X | X | X | | | |
| CFSB-133 | 6/3/2016 | X | X | X | | | |
| CFSB-019 | 6/4/2016 | X | X | | | | |
| CFMW-002 | 6/13/2016 | X | X | X | | | |
| CFMW-008a | 6/13/2016 | X | X | X | X | X | Below Water Table collected 88-93 ft bls |
| CFSB-019 | 6/13/2016 | | | X | | | |
| CFSB-025 | 6/13/2016 | X | X | X | | | |
| CFSB-026 | 6/13/2016 | X | X | X | | | |
| CFSB-027 | 6/13/2016 | X | X | X | | | |
| CFSB-030 | 6/13/2016 | X | X | X | | | |
| CFISS-001 | 6/14/2016 | X | X | | | | |
| CFISS-002 | 6/14/2016 | X | X | | | | |
| CFMW-008a | 6/14/2016 | | | | | | |
| CFMW-026 | 6/14/2016 | X | X | X | | X | |
| CFISS-003 | 6/15/2016 | X | X | | | | |
| CFISS-004 | 6/15/2016 | X | X | | | X | |
| CFMW-043 | 6/15/2016 | X | X | X | | | |
| CFISS-005 | 6/16/2016 | X | X | | | X | |
| CFMW-042 | 6/16/2016 | X | X | X | | | |
| CFISS-006 | 6/17/2016 | X | X | | | | |
| CFISS-007 | 6/17/2016 | X | X | | | | |
| CFMW-023a | 6/17/2016 | X | X | X | | X | |
| CFSB-130 | 6/17/2016 | | X | X | | | Inside Main Plant. No surface sample collected - concrete from 0-0.5 |

**Table 1. Summary of Soil Samples Collected During Phase I Site Characterization**
**Columbia Falls Aluminum Company, Phase I Site Characterization, 2000 Aluminum Drive, Columbia Falls, MT**

| Location ID | Date Sampled | Surface (0-0.5 ft bls) | Shallow (0.5-2 ft bls) | Intermediate - Depth (10-12 ft bls) | Below Water Table | Surface (0-0.5 ft bls) Lead Only | Notes |
|---|---|---|---|---|---|---|---|
| CFSB-131 | 6/17/2016 | | X | X | | | Inside Main Plant. No surface sample collected - concrete from 0-0.5. Two oppurtunistic samples collected due to visual contamination. 18-20 ft bls as most impacted interval. 22-23 ft bls as below impacts. |
| CFISS-008 | 6/18/2016 | X | X | | | | |
| CFISS-015 | 6/18/2016 | X | X | | | | |
| CFMW-023a | 6/18/2016 | | | | X | | Below Water Table collected 123-128 ft bls |
| CFISS-013 | 6/20/2016 | X | X | | | X | |
| CFISS-014 | 6/20/2016 | X | X | | | | |
| CFMW-054 | 6/20/2016 | X | X | X | | | |
| CFISS-011 | 6/21/2016 | X | X | | | X | |
| CFISS-012 | 6/21/2016 | X | X | | | | |
| CFMW-016a | 6/21/2016 | X | X | X | X | X | Below Water Table collected 79-84 ft bls |
| CFMW-047 | 6/21/2016 | | | | | X | |
| CFMW-047 | 6/21/2016 | X | X | X | | | |
| CFISS-009 | 6/22/2016 | X | X | | | | |
| CFISS-010 | 6/22/2016 | X | X | | | | |
| CFMW-050 | 6/22/2016 | X | X | X | | X | |
| CFISS-016 | 6/23/2016 | X | X | | | | |
| CFISS-017 | 6/23/2016 | X | X | | | | |
| CFISS-018 | 6/24/2016 | X | X | | | | |
| CFISS-019 | 6/24/2016 | X | X | | | | |
| CFMW-037 | 6/24/2016 | X | X | X | | X | |
| CFISS-020 | 6/25/2016 | X | X | | | | |
| CFISS-021 | 6/25/2016 | X | X | | | X | |
| CFMW-038 | 6/25/2016 | X | X | X | | X | |
| CFMW-038 | 6/25/2016 | | | | | | |
| CFMW-11a | 6/25/2016 | X | X | X | X | X | Below Water Table collected 31-36 ft bls |
| CFISS-022 | 6/27/2016 | X | X | | | | |
| CFISS-023 | 6/27/2016 | X | X | | | | |
| CFISS-029 | 6/27/2016 | X | X | | | | |
| CFISS-016 | 6/28/2016 | | X | | | | |
| CFMW-040 | 6/28/2016 | X | X | X | | X | |
| CFMW-040 | 6/28/2016 | | | | | | |
| CFISS-024 | 6/29/2016 | X | X | | | | |
| CFISS-025 | 6/30/2016 | X | X | | | | |
| CFISS-026 | 6/30/2016 | X | X | | | | |
| CFMW-027 | 6/30/2016 | X | X | X | | X | |
| CFMW-028a | 6/30/2016 | X | X | X | X | X | Below Water Table collected 48-53 ft bls. One additional oppurtunistic sample collected from CMFW-28a from a zone of visual impacts at 4.5-6' bls |
| CFISS-027 | 7/1/2016 | X | X | | | | |
| CFISS-028 | 7/1/2016 | X | X | | | X | |
| CFMW-033 | 7/1/2016 | X | X | X | | X | |
| CFISS-034 | 7/11/2016 | X | X | | | | |
| CFISS-035 | 7/11/2016 | X | X | | | | |
| CFMW-064 | 7/11/2016 | X | X | X | | X | |
| CFISS-032 | 7/12/2016 | X | X | | | X | |
| CFISS-033 | 7/12/2016 | X | X | | | | |
| CFMW-061 | 7/12/2016 | X | X | X | | X | |
| CFSB-114 | 7/12/2016 | X | X | X | | | |
| CFSB-119 | 7/12/2016 | X | X | X | | | |
| CFISS-031 | 7/13/2016 | X | X | | | | |
| CFISS-040 | 7/13/2016 | X | X | | | X | |
| CFMW-025a | 7/13/2016 | X | X | X | X | X | Below water table collected from 35-40 ft bls |
| CFSB-102 | 7/13/2016 | X | X | X | | | |
| CFSB-104 | 7/13/2016 | X | X | X | | | |
| CFSB-109 | 7/13/2016 | X | X | X | | | |
| CFSB-110 | 7/13/2016 | X | X | X | | | |
| CFISS-038 | 7/14/2016 | X | X | | | | |
| CFISS-039 | 7/14/2016 | X | X | | | | |
| CFISS-036 | 7/15/2016 | X | X | | | | |
| CFISS-037 | 7/15/2016 | X | X | | | X | |
| CFMW-056a | 7/15/2016 | X | X | X | X | X | Below water table collected from 37-42 ft bls |
| CFISS-041 | 7/16/2016 | X | X | | | | |
| CFISS-042 | 7/18/2016 | X | X | | | | |
| CFISS-043 | 7/18/2016 | X | X | | | | |
| CFSB-028 | 7/18/2016 | X | X | X | | | |
| CFISS-002 | 7/19/2016 | X | X | | | | |
| CFISS-030 | 7/20/2016 | X | X | | | | |
| CFMW-044a | 7/20/2016 | X | X | X | X | X | Below water table collected from 49-54 ft bls |
| CFSB-101 | 7/21/2016 | X | X | X | | | |
| CFSB-118 | 7/21/2016 | X | X | X | | | |
| CFMW-059a | 7/22/2016 | X | X | X | X | X | Below water table collected from 79-84 ft bls |
| CFSB-116 | 7/22/2016 | X | X | X | | | |
| CFISS-006 | 7/25/2016 | X | X | | | | |
| CFISS-008 | 7/26/2016 | X | X | | | | |
| CFMW-057a | 7/27/2016 | X | X | X | X | | Below water table collected from 30-35 ft bls |
| CFMW-032a | 8/8/2016 | X | X | X | X | X | Below water table collected from 43-48 ft bls |
| CFMW-045a | 8/12/2016 | X | X | X | X | | Below water table collected from 86-91 ft bls |
| CFMW-053a | 8/17/2016 | X | X | X | X | X | Below water table collected from 59-64 ft bls |
| CFMW-049a | 8/20/2016 | X | X | X | X | X | Below water table from 112-117 ft bls |
| CFTP-19 | 8/25/2016 | X | X | X | | | Shallow sample collected from 2-4 ft bls in accordance with modification #6 |
| CFTP-20 | 8/25/2016 | X | X | X | | | Shallow sample collected from 2-4 ft bls in accordance with modification #6 |
| CFTP-21 | 8/25/2016 | X | X | X | | | Shallow sample collected from 2-4 ft bls in accordance with modification #6 |
| CFTP-22 | 8/25/2016 | X | X | X | | | Shallow sample collected from 2-4 ft bls in accordance with modification #6 |
| CFTP-17 | 8/25/2016 | X | X | X | | | Shallow sample collected from 2-4 ft bls in accordance with modification #6 |
| CFTP-23 | 8/26/2016 | X | X | X | | | Shallow sample collected from 2-4 ft bls in accordance with modification #6 |
| CFTP-18 | 8/26/2016 | X | X | X | | | Shallow sample collected from 2-4 ft bls in accordance with modification #6 |
| CFSB-113 | 8/31/2016 | X | X | X | | X | Intermediate sample collected from 2-4 ft bls using hand tools in accordance with modification #7 |
| CFSB-115 | 8/31/2016 | X | X | X | | | Intermediate sample collected from 2-4 ft bls using hand tools in accordance with modification #7 |
| CFSDP-001-SO | 9/8/2016 | X | | | | | Proposed sediment location determiend to be soil |
| CFSDP-002-SO | 9/8/2016 | X | | | | | Proposed sediment location determiend to be soil |
| CFSDP-006-SO | 9/9/2016 | X | | | | | Proposed sediment location determiend to be soil |
| CFSDP-007-SO | 9/8/2016 | X | | | | | Proposed sediment location determiend to be soil |
| CFSDP-008-SO | 9/8/2016 | X | | | | | Proposed sediment location determiend to be soil |
| CFSDP-009-SO | 9/6/2016 | X | | | | | Proposed sediment location determiend to be soil |
| CFSDP-010-SO | 9/6/2016 | X | | | | | Proposed sediment location determiend to be soil |
| CFSDP-011-SO | 9/6/2016 | X | | | | | Proposed sediment location determiend to be soil |
| CFSDP-012-SO | 9/6/2016 | X | | | | | Proposed sediment location determiend to be soil |
| CFSDP-013-SO | 9/6/2016 | X | | | | | Proposed sediment location determiend to be soil |
| CFSDP-017-SO | 9/8/2016 | X | | | | | Proposed sediment location determiend to be soil |
| CFSDP-021-SO | 9/6/2016 | X | | | | | Proposed sediment location determiend to be soil |
| CFSDP-022-SO | 9/6/2016 | X | | | | | Proposed sediment location determiend to be soil |

**Table 2. Monitoring Well Construction Data - Screened Intervals and Survey Data**
**Columbia Falls Aluminum Company, Phase I Site Characterization, 2000 Aluminum Drive, Columbia Falls, MT**

| Location ID | Previous Well ID | Existing or Phase 1 Well | Unit | Date Surveyed | Surveyor | Northing (Y) | Easting (X) | Top of Casing Elevation (ft-amsl) | Well Pad/ Ground Elevation (ft-amsl) | Well Depth (ft-bls) | Well Screen Top Depth (ft-bls) | Well Screen Top Elevation (ft-amsl) | Well Screen Bottom Depth (ft-bls) | Well Screen Bottom Elevation (ft-amsl) | Well Construction Source |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| CFMW-001 | W2-CFMW1 | Existing Monitoring Well | Upper Hydrogeologic Unit | 8/1/2016 | Sands | 1549228.859 | 842170.366 | 3173.783 | 3170.907 | 152.5 | 132.5 | 3038.407 | 152.5 | 3018.407 | EPA Report/Old Well Log |
| CFMW-002 | -- | Phase 1 Monitoring Well | Upper Hydrogeologic Unit | 7/6/2016 | Sands | 1546021.158 | 843027.354 | 3145.580 | 3142.750 | 80 | 70 | 3072.75 | 80 | 3062.75 | CFAC Phase I |
| CFMW-003 | -- | Phase 1 Monitoring Well | Upper Hydrogeologic Unit | 7/6/2016 | Sands | 1547594.617 | 841640.301 | 3144.950 | 3142.320 | 54 | 44 | 3098.32 | 54 | 3088.32 | CFAC Phase I |
| CFMW-003a | -- | Phase 1 Monitoring Well | Below Upper Hydrogeologic Unit | 7/6/2016 | Sands | 1547603.170 | 841647.493 | 3145.570 | 3143.010 | 200 | 190 | 2953.01 | 200 | 2943.01 | CFAC Phase I |
| CFMW-007 | TW3 | Existing Monitoring Well | Upper Hydrogeologic Unit | 8/1/2016 | Sands | 1546426.597 | 843029.760 | 3149.199 | 3147.958 | 160 | 91 | 3056.958 | 102 | 3045.958 | EPA Report/Old Well Log |
| CFMW-008 | TW9 | Existing Monitoring Well | Upper Hydrogeologic Unit | 7/6/2016 | Sands | 1546564.756 | 844032.614 | 3192.970 | 3191.769 | 38.5 | No Screen | No Screen | Open Bottom | Open Bottom | EPA Report/Old Well Log |
| CFMW-008a | -- | Phase 1 Monitoring Well | Upper Hydrogeologic Unit | 7/6/2016 | Sands | 1546575.278 | 844043.577 | 3196.440 | 3194.690 | 98 | 88 | 3106.69 | 98 | 3096.69 | CFAC Phase I |
| CFMW-010 | -- | Phase 1 Monitoring Well | Upper Hydrogeologic Unit | 7/6/2016 | Sands | 1546115.479 | 842986.314 | 3147.060 | 3144.690 | 86 | 76 | 3068.69 | 86 | 3058.69 | CFAC Phase I |
| CFMW-011 | -- | Phase 1 Monitoring Well | Upper Hydrogeologic Unit | 7/6/2016 | Sands | 1545989.982 | 842462.741 | 3103.410 | 3100.980 | 50 | 40 | 3060.98 | 50 | 3050.98 | CFAC Phase I |
| CFMW-011a | -- | Phase 1 Monitoring Well | Below Upper Hydrogeologic Unit | 7/6/2016 | Sands | 1545990.300 | 842455.026 | 3103.650 | 3100.770 | 166 | 156 | 2944.77 | 166 | 2934.77 | CFAC Phase I |
| CFMW-012 | W11-TW17 | Existing Monitoring Well | Upper Hydrogeologic Unit | 7/6/2016 | Sands | 1545999.738 | 843116.466 | 3142.480 | 3140.472 | 90 | 70 | 3070.472 | 85 | 3055.472 | EPA Report/Old Well Log |
| CFMW-012a | -- | Phase 1 Monitoring Well | Below Upper Hydrogeologic Unit | 7/6/2016 | Sands | 1545978.652 | 843111.473 | 3142.760 | 3140.290 | 210 | 200 | 2940.29 | 210 | 2930.29 | CFAC Phase I |
| CFMW-014 | W3-TW20 | Existing Monitoring Well | Upper Hydrogeologic Unit | 8/1/2016 | Sands | 1545822.378 | 842858.322 | 3142.310 | 3139.968 | 92 | 72 | 3067.968 | 87 | 3052.968 | EPA Report/Old Well Log |
| CFMW-015 | W4-TW21 | Existing Monitoring Well | Upper Hydrogeologic Unit | 8/1/2016 | Sands | 1545790.290 | 843070.037 | 3140.650 | 3138.933 | 94 | 72 | 3066.933 | 87 | 3051.933 | EPA Report/Old Well Log |
| CFMW-016 | -- | Phase 1 Monitoring Well | Upper Hydrogeologic Unit | 7/6/2016 | Sands | 1545847.943 | 843955.534 | 3166.590 | 3163.840 | 95 | 85 | 3078.84 | 95 | 3068.84 | CFAC Phase I |
| CFMW-016a | -- | Phase 1 Monitoring Well | Upper Hydrogeologic Unit | 7/6/2016 | Sands | 1545856.544 | 843955.402 | 3167.110 | 3164.290 | 126 | 121 | 3043.29 | 126 | 3038.29 | CFAC Phase I |
| CFMW-017 | TW14 | Existing Monitoring Well | Upper Hydrogeologic Unit | 8/1/2016 | Sands | 1545913.137 | 844140.867 | 3210.569 | 3207.893 | 141 | 137 | 3070.893 | 141 | 3066.893 | EPA Report/Old Well Log |
| CFMW-018 | -- | Phase 1 Monitoring Well | Upper Hydrogeologic Unit | 7/6/2016 | Sands | 1545750.745 | 844586.938 | 3212.810 | 3210.040 | 122 | 112 | 3098.04 | 122 | 3088.04 | CFAC Phase I |
| CFMW-019 | W5-TW15 | Existing Monitoring Well | Upper Hydrogeologic Unit | 8/1/2016 | Sands | 1545555.121 | 843277.960 | 3137.810 | 3136.232 | 96 | 78 | 3058.232 | 88 | 3048.232 | EPA Report/Old Well Log |
| CFMW-019a | -- | Phase 1 Monitoring Well | Below Upper Hydrogeologic Unit | 7/6/2016 | Sands | 1545565.436 | 843291.647 | 3138.980 | 3136.510 | 220 | 210 | 2926.51 | 220 | 2916.51 | CFAC Phase I |
| CFMW-020 | TW8 | Existing Monitoring Well | Upper Hydrogeologic Unit | 8/1/2016 | Sands | 1545748.365 | 844071.614 | 3168.737 | 3166.624 | 130 | 113 | 3053.624 | 118 | 3048.624 | EPA Report/Old Well Log |
| CFMW-021 | W6-TW18 | Existing Monitoring Well | Upper Hydrogeologic Unit | 8/1/2016 | Sands | 1545558.392 | 843505.246 | 3138.155 | 3136.090 | 90 | 70 | 3066.09 | 85 | 3051.09 | EPA Report/Old Well Log |
| CFMW-022 | -- | Phase 1 Monitoring Well | Upper Hydrogeologic Unit | 7/6/2016 | Sands | 1545314.578 | 843942.176 | 3137.320 | 3134.390 | 80 | 70 | 3064.39 | 80 | 3054.39 | CFAC Phase I |
| CFMW-023 | TW10 | Existing Monitoring Well | Upper Hydrogeologic Unit | 8/1/2016 | Sands | 1545521.210 | 844694.956 | 3209.982 | 3208.638 | 144.5 | 137.5 | 3071.138 | 143.25 | 3065.388 | EPA Report |
| CFMW-025 | TW23 | Existing Monitoring Well | Upper Hydrogeologic Unit | 8/1/2016 | Sands | 1545240.341 | 840912.165 | 3103.541 | 3101.160 | 24.5 | 9.5 | 3091.66 | 24.5 | 3076.66 | EPA Report/Old Well Log |
| CFMW-025a | -- | Phase 1 Monitoring Well | Below Upper Hydrogeologic Unit | 8/1/2016 | Sands | 1545217.964 | 840914.892 | 3104.198 | 3101.489 | 95 | 85 | 3016.489 | 95 | 3006.489 | CFAC Phase I |
| CFMW-025b | W10-TW22 | Existing Monitoring Well | Upper Hydrogeologic Unit | 7/6/2016 | Sands | 1545233.747 | 840916.756 | 3103.660 | 3101.599 | 60 | 45 | 3056.599 | 60 | 3041.599 | EPA Report/Old Well Log |
| CFMW-026 | -- | Phase 1 Monitoring Well | Upper Hydrogeologic Unit | 7/6/2016 | Sands | 1545199.463 | 841222.779 | 3104.260 | 3101.580 | 45 | 35 | 3066.58 | 45 | 3056.58 | CFAC Phase I |
| CFMW-027 | -- | Phase 1 Monitoring Well | Upper Hydrogeologic Unit | 7/6/2016 | Sands | 1545251.431 | 842166.064 | 3097.110 | 3094.380 | 45 | 35 | 3059.38 | 45 | 3049.38 | CFAC Phase I |
| CFMW-028 | -- | Phase 1 Monitoring Well | Upper Hydrogeologic Unit | 8/1/2016 | Sands | 1544970.966 | 843041.414 | 3108.699 | 3105.991 | 60 | 50 | 3055.991 | 60 | 3045.991 | CFAC Phase I |
| CFMW-028a | -- | Phase 1 Monitoring Well | Upper Hydrogeologic Unit | 8/1/2016 | Sands | 1544970.077 | 843049.717 | 3108.660 | 3105.916 | 120 | 110 | 2995.916 | 120 | 2985.916 | CFAC Phase I |
| CFMW-029 | -- | Phase 1 Monitoring Well | Upper Hydrogeologic Unit | 7/6/2016 | Sands | 1545108.045 | 843463.411 | 3133.040 | 3130.520 | 76 | 66 | 3064.52 | 76 | 3054.52 | CFAC Phase I |
| CFMW-031 | W0-CFMW2 | Existing Monitoring Well | Upper Hydrogeologic Unit | 8/1/2016 | Sands | 1544867.601 | 842797.671 | 3109.490 | 3107.820 | 50 | 35 | 3072.82 | 50 | 3057.82 | EPA Report/Old Well Log |
| CFMW-032 | -- | Phase 1 Monitoring Well | Upper Hydrogeologic Unit | 8/29/2016 | Sands | 1544745.320 | 843964.007 | 3116.578 | 3114.020 | 55 | 45 | 3069.02 | 55 | 3059.02 | CFAC Phase I |
| CFMW-032a | -- | Phase 1 Monitoring Well | Below Upper Hydrogeologic Unit | 8/29/2016 | Sands | 1544744.536 | 843973.334 | 3116.805 | 3114.095 | 205 | 195 | 2919.095 | 205 | 2909.095 | CFAC Phase I |
| CFMW-033 | -- | Phase 1 Monitoring Well | Upper Hydrogeologic Unit | 7/6/2016 | Sands | 1544545.111 | 842408.017 | 3110.640 | 3107.970 | 60 | 50 | 3057.97 | 60 | 3047.97 | CFAC Phase I |
| CFMW-034 | -- | Phase 1 Monitoring Well | Upper Hydrogeologic Unit | 7/6/2016 | Sands | 1544513.493 | 843342.204 | 3109.990 | 3107.450 | 60 | 50 | 3057.45 | 60 | 3047.45 | CFAC Phase I |
| CFMW-035 | -- | Phase 1 Monitoring Well | Upper Hydrogeologic Unit | 7/6/2016 | Sands | 1544499.012 | 844447.319 | 3109.920 | 3107.120 | 70 | 60 | 3047.12 | 70 | 3037.12 | CFAC Phase I |
| CFMW-036 | W1-PW7 | Existing Former Production Well | Production Well | EPA Report | EPA Report | 1541629.329 | 843914.647 | 3021.600 | 3030.000 | 61.6 | 53.6 | 2968.00 | 61.60 | 2960.00 | EPA Report |
| CFMW-037 | -- | Phase 1 Monitoring Well | Upper Hydrogeologic Unit | 7/6/2016 | Sands | 1543140.324 | 844473.946 | 3113.640 | 3110.870 | 100 | 90 | 3020.87 | 100 | 3010.87 | CFAC Phase I |
| CFMW-038 | -- | Phase 1 Monitoring Well | Upper Hydrogeologic Unit | 7/6/2016 | Sands | 1543075.138 | 843981.359 | 3113.770 | 3110.880 | 105 | 95 | 3015.88 | 105 | 3005.88 | CFAC Phase I |
| CFMW-040 | -- | Phase 1 Monitoring Well | Upper Hydrogeologic Unit | 7/6/2016 | Sands | 1543076.822 | 842863.264 | 3113.720 | 3111.050 | 90 | 80 | 3031.05 | 90 | 3021.05 | CFAC Phase I |
| CFMW-042 | -- | Phase 1 Monitoring Well | Upper Hydrogeologic Unit | 7/6/2016 | Sands | 1543285.825 | 842383.655 | 3110.340 | 3107.520 | 60 | 50 | 3057.52 | 60 | 3047.52 | CFAC Phase I |
| CFMW-043 | -- | Phase 1 Monitoring Well | Upper Hydrogeologic Unit | 7/6/2016 | Sands | 1544078.364 | 842157.850 | 3109.910 | 3106.970 | 60 | 50 | 3056.97 | 60 | 3046.97 | CFAC Phase I |
| CFMW-044 | W8-TW2 | Existing Monitoring Well | Upper Hydrogeologic Unit | 8/1/2016 | Sands | 1543941.726 | 841700.388 | 3108.093 | 3105.883 | 53 | No Screen | No Screen | Open Bottom | Open Bottom | EPA Report/Old Well Log |
| CFMW-044a | -- | Phase 1 Monitoring Well | Upper Hydrogeologic Unit | 8/1/2016 | Sands | 1543941.659 | 841685.038 | 3108.716 | 3106.109 | 110 | 100 | 3006.109 | 110 | 2996.109 | CFAC Phase I |
| CFMW-044b | TW1 | Existing Monitoring Well | Below Upper Hydrogeologic Unit | 8/1/2016 | Sands | 1543937.612 | 841699.554 | 3107.979 | 3105.262 | >200 | No Screen | No Screen | Open Bottom | Open Bottom | EPA Report/Old Well Log |
| CFMW-045 | -- | Phase 1 Monitoring Well | Upper Hydrogeologic Unit | 8/29/2016 | Sands | 1542768.892 | 842543.665 | 3113.750 | 3111.261 | 96 | 86 | 3025.261 | 96 | 3015.261 | CFAC Phase I |
| CFMW-045a | -- | Phase 1 Monitoring Well | Upper Hydrogeologic Unit | 8/29/2016 | Sands | 1542768.562 | 842554.018 | 3113.934 | 3111.284 | 160 | 150 | 2961.284 | 160 | 2951.284 | CFAC Phase I |
| CFMW-047 | -- | Phase 1 Monitoring Well | Upper Hydrogeologic Unit | 7/6/2016 | Sands | 1542470.126 | 844332.708 | 3117.180 | 3114.480 | 120 | 110 | 3004.48 | 120 | 2994.48 | CFAC Phase I |
| CFMW-048 | PW3 | Existing Former Production Well | Production Well | EPA Report | EPA Report | 1542485.180 | 844497.403 | 3106.850 | 3120.000 | 119.89 | 109.89 | 2996.960 | 119.89 | 2986.960 | EPA Report |
| CFMW-049 | W7-TW19 | Existing Monitoring Well | Upper Hydrogeologic Unit | 8/1/2016 | Sands | 1542470.637 | 844793.481 | 3122.693 | 3120.165 | 113 | 100 | 3020.165 | 111 | 3009.165 | EPA Report/Old Well Log |
| CFMW-049a | -- | Phase 1 Monitoring Well | Upper Hydrogeologic Unit | 8/29/2016 | Sands | 1542484.164 | 844793.737 | 3122.691 | 3120.493 | 148.5 | 138.5 | 2981.993 | 148.5 | 2971.993 | CFAC Phase I |
| CFMW-050 | -- | Phase 1 Monitoring Well | Upper Hydrogeologic Unit | 7/6/2016 | Sands | 1542299.178 | 844928.802 | 3123.120 | 3120.240 | 120 | 110 | 3010.24 | 120 | 3000.24 | CFAC Phase I |
| CFMW-051 | W9-PW5 | Existing Former Production Well | Production Well | EPA Report | EPA Report | 1542149.083 | 845500.048 | 3123.250 | 3136.000 | 162.07 | 137.9 | 2985.350 | 162.07 | 2961.180 | EPA Report/Old Well Log |
| CFMW-052 | PW4 | Existing Former Production Well | Production Well | EPA Report | EPA Report | 1542121.449 | 846201.695 | 3139.470 | 3152.000 | 174.98 | 154.19 | 2985.280 | 174.98 | 2964.490 | Old Well Log |

**Table 2. Monitoring Well Construction Data - Screened Intervals and Survey Data**
**Columbia Falls Aluminum Company, Phase I Site Characterization, 2000 Aluminum Drive, Columbia Falls, MT**

| Location ID | Previous Well ID | Existing or Phase 1 Well | Unit | Date Surveyed | Surveyor | Northing (Y) | Easting (X) | Top of Casing Elevation (ft-amsl) | Well Pad/ Ground Elevation (ft-amsl) | Well Depth (ft-bls) | Well Screen Top Depth (ft-bls) | Well Screen Top Elevation (ft-amsl) | Well Screen Bottom Depth (ft-bls) | Well Screen Bottom Elevation (ft-amsl) | Well Construction Source |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| CFMW-053 | TW16 | Existing Monitoring Well | Upper Hydrogeologic Unit | 8/1/2016 | Sands | 1542974.491 | 841601.392 | 3111.227 | 3109.649 | 77 | 47 | 3062.649 | 77 | 3032.649 | EPA Report/Old Well Log |
| CFMW-053a | -- | Phase 1 Monitoring Well | Below Upper Hydrogeologic Unit | 8/29/2016 | Sands | 1542988.456 | 841600.660 | 3112.061 | 3109.666 | 160 | 150 | 2959.666 | 160 | 2949.666 | CFAC Phase I |
| CFMW-054 | -- | Phase 1 Monitoring Well | Upper Hydrogeologic Unit | 7/6/2016 | Sands | 1542966.021 | 841003.141 | 3112.670 | 3109.920 | 85 | 75 | 3034.92 | 85 | 3024.92 | CFAC Phase I |
| CFMW-056 | TW11 | Existing Monitoring Well | Below Upper Hydrogeologic Unit | 8/1/2016 | Sands | 1544572.964 | 839789.319 | 3101.349 | 3098.851 | 181.08 | No Screen | No Screen | Open Bottom | Open Bottom | EPA Report/Old Well Log |
| CFMW-056a | -- | Phase 1 Monitoring Well | Below Upper Hydrogeologic Unit | 8/1/2016 | Sands | 1544587.443 | 839786.440 | 3101.079 | 3098.671 | 135 | 125 | 2973.671 | 135 | 2963.671 | CFAC Phase I |
| CFMW-056b | -- | Phase 1 Monitoring Well | Upper Hydrogeologic Unit | 8/1/2016 | Sands | 1544590.852 | 839778.849 | 3101.199 | 3098.599 | 50 | 40 | 3058.599 | 50 | 3048.599 | CFAC Phase I |
| CFMW-057 | TW12 | Existing Monitoring Well | Below Upper Hydrogeologic Unit | 8/1/2016 | Sands | 1543626.421 | 837706.038 | 3094.937 | 3092.563 | 185.75 | Uknown | Uknown | Uknown | Uknown | EPA Report |
| CFMW-057a | -- | Phase 1 Monitoring Well | Below Upper Hydrogeologic Unit | 8/29/2016 | Sands | 1543635.868 | 837689.701 | 3094.774 | 3092.778 | 138 | 128 | 2964.778 | 138 | 2954.778 | CFAC Phase I |
| CFMW-059 | -- | Phase 1 Monitoring Well | Upper Hydrogeologic Unit | 8/1/2016 | Sands | 1542120.760 | 837611.730 | 3119.421 | 3117.387 | 90 | 80 | 3037.387 | 90 | 3027.387 | CFAC Phase I |
| CFMW-059a | -- | Phase 1 Monitoring Well | Below Upper Hydrogeologic Unit | 8/1/2016 | Sands | 1542123.943 | 837619.424 | 3119.178 | 3117.047 | 168 | 158 | 2959.047 | 168 | 2949.047 | CFAC Phase I |
| CFMW-061 | -- | Phase 1 Monitoring Well | Upper Hydrogeologic Unit | 8/1/2016 | Sands | 1541698.045 | 843728.230 | 3027.378 | 3024.323 | 23 | 13 | 3011.323 | 23 | 3001.323 | CFAC Phase I |
| CFMW-062 | PW6 | Existing Former Production Well | Production Well | EPA Report | EPA Report | 1541841.609 | 843927.216 | 3021.600 | 3031.000 | 70.2 | 62.2 | 2959.400 | 70.2 | 2951.400 | Old Well Log |
| CFMW-064 | -- | Phase 1 Monitoring Well | Upper Hydrogeologic Unit | 8/29/2016 | Sands | 1541612.776 | 844718.875 | 3029.141 | 3026.002 | 30 | 20 | 3006.002 | 30 | 2996.002 | CFAC Phase I |

ft-bls - Feet below land surface
ft-amsl - Feet above mean sea level
NM - Not Measured
Dry - Groundwater not present in well

## Table 3. Groundwater Elevation Data - August 30, 2016 and November 29, 2016
## Columbia Falls Aluminum Company, Phase I Site Characterization, 2000 Aluminum Drive, Columbia Falls, MT

| Location ID | Previous Well ID | August 30, 2016 DTW (ft-btoc) | August 30, 2016 DTB (ft-btoc) | August 30, 2016 Groundwater Elevation (ft-amsl) | November 29, 2016 DTW (ft-btoc) | November 29, 2016 DTB (ft-btoc) | November 29, 2016 Groundwater Elevation (ft-amsl) |
|---|---|---|---|---|---|---|---|
| CFMW-001 | W2-CFMW1 | 98.53 | 155.20 | 3075.253 | 98.34 | 153.37 | 3075.443 |
| CFMW-002 | -- | 80.30 | 82.65 | 3065.280 | 81.57 | 82.46 | 3064.010 |
| CFMW-003 | -- | 23.47 | 54.42 | 3121.480 | 22.12 | 54.45 | 3122.830 |
| CFMW-003a | -- | 151.40 | 203.21 | 2994.170 | 149.34 | 203.21 | 2996.230 |
| CFMW-007 | TW3 | 81.35 | 159.70 | 3067.849 | 76.20 | 159.14 | 3072.999 |
| CFMW-008 | TW9 | 93.60 | 189.21 | 3099.370 | 76.18 | 187.81 | 3116.790 |
| CFMW-008a | -- | 65.03 | 95.14 | 3131.410 | 64.01 | 95.40 | 3132.430 |
| CFMW-010 | -- | 81.68 | 86.70 | 3065.380 | 82.80 | 86.40 | 3064.260 |
| CFMW-011 | -- | 38.42 | 52.90 | 3064.990 | 40.02 | 52.88 | 3063.390 |
| CFMW-011a | -- | 100.55 | 171.12 | 3003.100 | 99.87 | 168.58 | 3003.780 |
| CFMW-012 | W11-TW17 | 75.70 | 81.84 | 3066.780 | 77.06 | 81.89 | 3065.420 |
| CFMW-012a | -- | 145.34 | 213.40 | 2997.420 | 143.71 | 213.40 | 2999.050 |
| CFMW-014 | W3-TW20 | 77.43 | 93.43 | 3064.880 | 78.97 | 93.41 | 3063.340 |
| CFMW-015 | W4-TW21 | 75.57 | 94.56 | 3065.080 | 76.64 | 94.54 | 3064.010 |
| CFMW-016 | -- | 97.70 | 98.82 | 3068.890 | 93.29 | 97.83 | 3073.300 |
| CFMW-016a | -- | 100.33 | 128.36 | 3066.780 | 93.79 | 128.35 | 3073.320 |
| CFMW-017 | TW14 | DRY | 140.88 | DRY | 137.02 | 140.92 | 3073.549 |
| CFMW-018 | -- | DRY | 126.74 | DRY | DRY | 127.54 | DRY |
| CFMW-019 | W5-TW15 | 73.38 | 96.50 | 3064.430 | 75.11 | 96.49 | 3062.700 |
| CFMW-019a | -- | 141.50 | 223.20 | 2997.480 | 139.91 | 223.25 | 2999.070 |
| CFMW-020 | TW8 | 102.05 | 132.63 | 3066.687 | 95.70 | 132.42 | 3073.037 |
| CFMW-021 | W6-TW18 | 73.72 | 89.56 | 3064.435 | 75.38 | 89.59 | 3062.775 |
| CFMW-022 | -- | 72.58 | 83.26 | 3064.740 | 73.16 | 83.22 | 3064.160 |
| CFMW-023 | TW10 | 125.40 | 142.96 | 3084.582 | 117.51 | 143.23 | 3092.472 |
| CFMW-025 | TW23 | DRY | 26.80 | DRY | 26.45 | 26.78 | 3077.091 |
| CFMW-025a | -- | 48.55 | 98.42 | 3055.648 | 56.68 | 98.43 | 3047.518 |
| CFMW-025b | W10-TW22 | 34.82 | 64.85 | 3068.840 | 33.93 | 64.55 | 3069.730 |
| CFMW-026 | -- | 40.20 | 47.44 | 3064.060 | 42.42 | 47.43 | 3061.840 |
| CFMW-027 | -- | 32.86 | 48.60 | 3064.250 | 34.77 | 48.59 | 3062.340 |
| CFMW-028 | -- | 44.46 | 62.40 | 3064.239 | 46.39 | 62.39 | 3062.309 |
| CFMW-028a | -- | 44.31 | 122.62 | 3064.350 | 46.26 | 122.63 | 3062.400 |
| CFMW-029 | -- | 68.60 | 73.12 | 3064.440 | 70.23 | 78.13 | 3062.810 |
| CFMW-031 | W0-CFMW2 | 45.61 | 52.30 | 3063.880 | 47.81 | 52.29 | 3061.680 |
| CFMW-032 | -- | 51.99 | 57.70 | 3064.588 | 54.10 | 57.68 | 3062.478 |
| CFMW-032a | -- | 113.22 | 206.53 | 3003.585 | 112.13 | 206.43 | 3004.675 |
| CFMW-033 | -- | 46.88 | 63.59 | 3063.760 | 49.21 | 63.58 | 3061.430 |
| CFMW-034 | -- | 48.23 | 62.48 | 3061.760 | 53.66 | 62.48 | 3056.330 |
| CFMW-035 | -- | 46.56 | 70.60 | 3063.360 | 48.01 | 70.53 | 3061.910 |
| CFMW-036 | W1-PW7 | NM | NM | NM | NM | NM | NM |
| CFMW-037 | -- | 78.48 | 103.27 | 3035.160 | 85.80 | 103.25 | 3027.840 |
| CFMW-038 | -- | 86.82 | 107.14 | 3026.950 | 89.51 | 106.71 | 3024.260 |
| CFMW-040 | -- | 77.17 | 92.77 | 3036.550 | 81.71 | 92.88 | 3032.010 |
| CFMW-042 | -- | 57.94 | 63.02 | 3052.400 | DRY | 63.03 | DRY |
| CFMW-043 | -- | 47.99 | 62.01 | 3061.920 | 52.39 | 62.00 | 3057.520 |
| CFMW-044 | W8-TW2 | 48.07 | 54.16 | 3060.023 | 51.68 | 54.21 | 3056.413 |
| CFMW-044a | -- | 52.32 | 112.97 | 3056.396 | 55.84 | 223.95 | 3052.876 |
| CFMW-044b | TW1 | 63.95 | 241.01 | 3044.029 | 56.60 | 241.09 | 3051.379 |
| CFMW-045 | -- | 83.78 | 100.08 | 3029.970 | 88.55 | 99.16 | 3025.200 |
| CFMW-045a | -- | 89.56 | 161.28 | 3024.374 | 91.05 | 161.27 | 3022.884 |
| CFMW-047 | -- | 99.75 | 122.93 | 3017.430 | 99.46 | 122.95 | 3017.720 |
| CFMW-048 | PW3 | NM | NM | NM | NM | NM | NM |
| CFMW-049 | W7-TW19 | 104.90 | 141.01 | 3017.793 | 103.25 | 113.99 | 3019.443 |
| CFMW-049a | -- | 105.00 | 151.10 | 3017.691 | 103.18 | 151.10 | 3019.511 |
| CFMW-050 | -- | 105.78 | 123.37 | 3017.340 | 103.96 | 123.37 | 3019.160 |
| CFMW-051 | W9-PW5 | NM | NM | NM | NM | NM | NM |
| CFMW-052 | PW4 | NM | NM | NM | NM | NM | NM |
| CFMW-053 | TW16 | 58.78 | 76.24 | 3052.447 | 72.65 | 78.24 | 3038.577 |
| CFMW-053a | -- | 88.30 | 162.50 | 3023.761 | 90.09 | 162.48 | 3021.971 |
| CFMW-054 | -- | 73.77 | 87.55 | 3038.900 | 77.56 | 87.47 | 3035.110 |
| CFMW-056 | TW11 | 86.56 | 180.58 | 3014.789 | 85.43 | 180.61 | 3015.919 |
| CFMW-056a | -- | 79.96 | 137.40 | 3021.119 | 78.70 | 137.41 | 3022.379 |
| CFMW-056b | -- | 33.70 | 52.65 | 3067.499 | 35.27 | 52.62 | 3065.929 |
| CFMW-057 | TW12 | 83.81 | 184.40 | 3011.127 | 82.29 | 183.89 | 3012.647 |
| CFMW-057a | -- | 78.55 | 140.35 | 3016.224 | 77.28 | 140.36 | 3017.494 |
| CFMW-059 | -- | 70.42 | 92.70 | 3049.001 | 70.82 | 92.71 | 3048.601 |
| CFMW-059a | -- | 73.05 | 162.98 | 3046.128 | 71.42 | 163.86 | 3047.758 |
| CFMW-061 | -- | 13.82 | 26.04 | 3013.558 | 12.35 | 26.50 | 3015.028 |
| CFMW-062 | PW6 | NM | NM | NM | NM | NM | NM |
| CFMW-064 | -- | 14.40 | 33.08 | 3014.741 | 12.63 | 33.21 | 3016.511 |

ft-btoc - Feet below top of casing
ft-amsl - Feet above mean sea level
NM - Not Measured
Dry - Groundwater not present in well

**Table 4. Summary of Groundwater and Surface Water Samples Collected During Round 1 of Phase I Site Characterization, Columbia Falls Aluminum Company, Phase I Site Characterization, 2000 Aluminum Drive, Columbia Falls, MT**

| Proposed Location ID | Field Sample ID | Screen Type / Sample Type | Date Completed | Monitoring Well Location Type /Surface Water Adjacent Feature |
|---|---|---|---|---|
| CFMW-001 | CFMW-001-GW | Upper Hydrogeologic Unit | 9/20/2016 | Existing Monitoring Well |
| CFMW-002 | CFMW-002-GW | Upper Hydrogeologic Unit | 9/12/2016 | New Monitoring Well |
| CFMW-003 | CFMW-003-GW | Upper Hydrogeologic Unit | 9/14/2016 | New Monitoring Well |
| CFMW-003a | CFMW-003a-GW | Below Upper Hydrogeologic Unit | 9/20/2016 | New Monitoring Well |
| CFMW-007 | CFMW-007-GW | Upper Hydrogeologic Unit | 9/21/2016 | Existing Monitoring Well |
| CFMW-008 | CFMW-008-GW | Upper Hydrogeologic Unit | 9/21/2016 | Existing Monitoring Well |
| CFMW-008a | CFMW-008a-GW | Upper Hydrogeologic Unit | 9/15/2016 | New Monitoring Well |
| CFMW-010 | CFMW-010-GW | Upper Hydrogeologic Unit | 9/12/2016 | New Monitoring Well |
| CFMW-011 | CFMW-011-GW | Upper Hydrogeologic Unit | 9/13/2016 | New Monitoring Well |
| CFMW-011a | CFMW-011a-GW | Below Upper Hydrogeologic Unit | 9/20/2016 | New Monitoring Well |
| CFMW-012 | CFMW-012-GW | Upper Hydrogeologic Unit | 9/12/2016 | Existing Monitoring Well |
| CFMW-012a | CFMW-012a-GW | Below Upper Hydrogeologic Unit | 9/15/2016 | New Monitoring Well |
| CFMW-014 | CFMW-014-GW | Upper Hydrogeologic Unit | 9/12/2016 | Existing Monitoring Well |
| CFMW-015 | CFMW-015-GW | Upper Hydrogeologic Unit | 9/12/2016 | Existing Monitoring Well |
| CFMW-016 | DRY | Upper Hydrogeologic Unit | NA | New Monitoring Well |
| CFMW-016a | CFMW-016a-GW | Upper Hydrogeologic Unit | 9/21/2016 | New Monitoring Well |
| CFMW-017 | DRY | Upper Hydrogeologic Unit | NA | Existing Monitoring Well |
| CFMW-018 | DRY | Upper Hydrogeologic Unit | NA | New Monitoring Well |
| CFMW-019 | CFMW-019-GW | Upper Hydrogeologic Unit | 9/12/2016 | Existing Monitoring Well |
| CFMW-019a | CFMW-019a-GW | Below Upper Hydrogeologic Unit | 9/20/2016 | New Monitoring Well |
| CFMW-020 | CFMW-020-GW | Upper Hydrogeologic Unit | 9/20/2016 | Existing Monitoring Well |
| CFMW-021 | CFMW-021-GW | Upper Hydrogeologic Unit | 9/12/2016 | Existing Monitoring Well |
| CFMW-022 | CFMW-022-GW | Upper Hydrogeologic Unit | 9/13/2016 | New Monitoring Well |
| CFMW-023 | CFMW-023-GW | Upper Hydrogeologic Unit | 9/21/2016 | Existing Monitoring Well |
| CFMW-025 | DRY | Upper Hydrogeologic Unit | NA | Existing Monitoring Well |
| CFMW-025a | CFMW-025a-GW | Below Upper Hydrogeologic Unit | 9/13/2016 | New Monitoring Well |
| CFMW-025b | CFMW-25b-GW | Upper Hydrogeologic Unit | 9/13/2016 | Existing Monitoring Well |
| CFMW-026 | CFMW-026-GW | Upper Hydrogeologic Unit | 9/13/2016 | New Monitoring Well |
| CFMW-027 | CFMW-027-GW | Upper Hydrogeologic Unit | 9/13/2016 | New Monitoring Well |
| CFMW-028 | CFMW-028-GW | Upper Hydrogeologic Unit | 9/13/2016 | New Monitoring Well |
| CFMW-028a | CFMW-028a-GW | Upper Hydrogeologic Unit | 9/20/2016 | New Monitoring Well |
| CFMW-029 | CFMW-029-GW | Upper Hydrogeologic Unit | 9/13/2016 | New Monitoring Well |
| CFMW-031 | CFMW-031-GW | Upper Hydrogeologic Unit | 9/15/2016 | Existing Monitoring Well |
| CFMW-032 | CFMW-032-GW | Upper Hydrogeologic Unit | 9/15/2016 | New Monitoring Well |
| CFMW-032a | CFMW-032a-GW | Below Upper Hydrogeologic Unit | 9/16/2016 | New Monitoring Well |
| CFMW-033 | CFMW-033-GW | Upper Hydrogeologic Unit | 9/15/2016 | New Monitoring Well |
| CFMW-034 | CFMW-034-GW | Upper Hydrogeologic Unit | 9/14/2016 | New Monitoring Well |
| CFMW-035 | CFMW-035-GW | Upper Hydrogeologic Unit | 9/13/2016 | New Monitoring Well |
| CFMW-037 | CFMW-037-GW | Upper Hydrogeologic Unit | 9/16/2016 | New Monitoring Well |
| CFMW-038 | CFMW-038-GW | Upper Hydrogeologic Unit | 9/14/2016 | New Monitoring Well |
| CFMW-040 | CFMW-040-GW | Upper Hydrogeologic Unit | 9/14/2016 | New Monitoring Well |
| CFMW-042 | CFMW-042-GW | Upper Hydrogeologic Unit | 9/14/2016 | New Monitoring Well |
| CFMW-043 | CFMW-043-GW | Upper Hydrogeologic Unit | 9/13/2016 | New Monitoring Well |
| CFMW-044 | CFMW-044-GW | Upper Hydrogeologic Unit | 9/15/2016 | Existing Monitoring Well |
| CFMW-044a | CFMW-044a-GW | Upper Hydrogeologic Unit | 9/19/2016 | New Monitoring Well |
| CFMW-044b | CFMW-044b-GW | Below Upper Hydrogeologic Unit | 9/19/2016 | Existing Monitoring Well |
| CFMW-045 | CFMW-045-GW | Upper Hydrogeologic Unit | 9/15/2016 | New Monitoring Well |
| CFMW-045a | CFMW-045a-GW | Upper Hydrogeologic Unit | 9/19/2016 | New Monitoring Well |
| CFMW-047 | CFMW-047-GW | Upper Hydrogeologic Unit | 9/14/2016 | New Monitoring Well |
| CFMW-049 | CFMW-049-GW | Upper Hydrogeologic Unit | 9/21/2016 | Existing Monitoring Well |
| CFMW-049a | CFMW-049a-GW | Upper Hydrogeologic Unit | 9/16/2016 | New Monitoring Well |
| CFMW-050 | CFMW-050-GW | Upper Hydrogeologic Unit | 9/19/2016 | New Monitoring Well |
| CFMW-053 | CFMW-053-GW | Upper Hydrogeologic Unit | 9/14/2016 | Existing Monitoring Well |
| CFMW-053a | CFMW-053a-GW | Below Upper Hydrogeologic Unit | 9/19/2016 | New Monitoring Well |
| CFMW-054 | CFMW-054-GW | Upper Hydrogeologic Unit | 9/14/2016 | New Monitoring Well |
| CFMW-056 | CFMW-056-GW | Below Upper Hydrogeologic Unit | 9/20/2016 | Existing Monitoring Well |
| CFMW-056a | CFMW-056a-GW | Below Upper Hydrogeologic Unit | 9/20/2016 | New Monitoring Well |
| CFMW-056b | CFMW-056b-GW | Upper Hydrogeologic Unit | 9/13/2016 | New Monitoring Well |
| CFMW-057 | CFMW-057-GW | Below Upper Hydrogeologic Unit | 9/19/2016 | Existing Monitoring Well |
| CFMW-057a | CFMW-057a-GW | Below Upper Hydrogeologic Unit | 9/19/2016 | New Monitoring Well |
| CFMW-059 | CFMW-059-GW | Upper Hydrogeologic Unit | 9/15/2016 | New Monitoring Well |
| CFMW-059a | CFMW-059a-GW | Below Upper Hydrogeologic Unit | 9/19/2016 | New Monitoring Well |
| CFMW-061 | CFMW-061-GW | Upper Hydrogeologic Unit | 9/15/2016 | New Monitoring Well |
| CFMW-064 | CFMW-064-GW | Upper Hydrogeologic Unit | 9/15/2016 | New Monitoring Well |
| CFSW-001 | CFSWP-001-SW | Surface Water | 9/16/2016 | Flathead River |
| CFSW-002 | CFSWP-002-SW | Surface Water | 9/16/2016 | Flathead River |
| CFSW-003 | CFSWP-003-SW | Surface Water | 9/9/2016 | Seep Area |
| CFSW-004 | CFSWP-004-SW | Surface Water | 9/9/2016 | Seep Area |
| CFSW-005 | CFSWP-005-SW | Surface Water | 9/9/2016 | Seep Area |
| CFSW-006 | CFSWP-006-SW | Surface Water | 9/9/2016 | Flathead River |
| CFSW-007 | CFSWP-007-SW | Surface Water | 9/16/2016 | Flathead River |
| CFSW-008 | CFSWP-008-SW | Surface Water | 9/16/2016 | Flathead River |
| CFSW-009 | CFSWP-009-SW | Surface Water | 6/7/2016 | Cedar Creek Reservoir Overflow |
| CFSW-010 | CFSWP-010-SW | Surface Water | 6/7/2016 | Cedar Creek Reservoir Overflow |
| CFSW-011 | CFSWP-011-SW | Surface Water | 6/7/2016 | Cedar Creek Reservoir Overflow |
| CFSW-012 | CFSWP-012-SW | Surface Water | 6/7/2016 | Cedar Creek Reservoir Overflow |
| CFSW-013 | CFSWP-013-SW | Surface Water | 6/7/2016 | Cedar Creek Reservoir Overflow |
| CFSW-014 | CFSWP-014-SW | Surface Water | 8/29/2016 | Cedar Creek |
| CFSW-015 | CFSWP-015-SW | Surface Water | 8/29/2016 | Cedar Creek |
| CFSW-016 | CFSWP-016-SW | Surface Water | 8/29/2016 | Cedar Creek |
| CFSW-017 | CFSWP-017-SW | Surface Water | 9/16/2016 | Flathead River |
| CFSW-018 | CFSWP-018-SW | Surface Water | 6/6/2016 | South Percolation Ponds |
| CFSW-019 | CFSWP-019-SW | Surface Water | 6/6/2016 | South Percolation Ponds |
| CFSW-020 | CFSWP-020-SW | Surface Water | 6/6/2016 | South Percolation Ponds |
| CFSW-021 | CFSWP-021-SW | Surface Water | 6/6/2016 | Northern SW Area |
| CFSW-022 | CFSWP-022-SW | Surface Water | 6/6/2016 | Northern SW Area |
| CFSW-023 | DRY | Surface Water | NA | Northwest Percolation Pond |
| CFSW-024 | DRY | Surface Water | NA | Northeast Percolation Pond |

NA - Not Available

Dry - Groundwater not present in well

**Table 5. Summary of Sediment Samples Collected During Phase I Site Characterization**
**Columbia Falls Aluminum Company, LLC, Phase I Site Characterization, 2000 Aluminum Drive, Columbia Falls, MT**

| Proposed Location ID | Field Sample ID | Sample Type | Date Completed | Surface Water Feature |
|---|---|---|---|---|
| CFSW-003 | CFSDP-003-SD | Sediment | 9/9/2016 | Seep Area |
| CFSW-004 | CFSDP-004-SD | Sediment | 9/9/2016 | Seep Area |
| CFSW-005 | CFSDP-005-SD | Sediment | 9/9/2016 | Seep Area |
| CFSW-014 | CFSDP-014-SD | Sediment | 8/29/2016 | Cedar Creek |
| CFSW-015 | CFSDP-015-SD | Sediment | 8/29/2016 | Cedar Creek |
| CFSW-016 | CFSDP-016-SD | Sediment | 8/29/2016 | Cedar Creek |
| CFSW-018 | CFSDP-018-SD | Sediment | 9/7/2016 | South Percolation Ponds |
| CFSW-019 | CFSDP-019-SD | Sediment | 9/7/2016 | South Percolation Ponds |
| CFSW-020 | CFSDP-020-SD | Sediment | 9/7/2016 | South Percolation Ponds |
| CFSW-023 | CFSDP-023-SD | Sediment | 9/7/2016 | Northwest Percolation Pond |
| CFSW-024 | CFSDP-024-SD | Sediment | 9/7/2016 | Northeast Percolation Pond |

**Table 6. Soil Gas Screening Data**
**Columbia Falls Aluminum Company, LLC, Phase I Site Characterization, 2000 Aluminum Drive, Columbia Falls, MT**

| Location: | Screening Date: | Screening Area: | Methane (% LEL) | VOCs (ppm) |
|---|---|---|---|---|
| CFSGS-001 | 6/3/2016 | Sanitary Landfill | ND | **0.2** |
| CFSGS-002 | 6/3/2016 | Sanitary Landfill | ND | ND |
| CFSGS-003 | 6/3/2016 | Sanitary Landfill | ND | **0.1** |
| CFSGS-004 | 6/3/2016 | Sanitary Landfill | ND | ND |
| CFSGS-005 | 6/4/2016 | West Landfill | ND | **0.1** |
| CFSGS-006 | 6/4/2016 | West Landfill | ND | **0.6** |
| CFSGS-007 | 6/4/2016 | West Landfill | ND | ND |
| CFSGS-008 | 6/4/2016 | West Landfill | ND | ND |
| CFSGS-009 | 6/4/2016 | West Landfill | ND | ND |
| CFSGS-010 | 4/21/2016 | Wet Scrubber Sludge Pond | ND | ND |
| CFSGS-011 | 4/21/2016 | Wet Scrubber Sludge Pond | ND | ND |
| CFSGS-012 | 4/21/2016 | Wet Scrubber Sludge Pond | ND | ND |
| CFSGS-013 | 4/21/2016 | Wet Scrubber Sludge Pond | ND | ND |
| CFSGS-014 | 4/22/2016 | Industrial Landfill | ND | **4.9** |
| CFSGS-015 | 4/22/2016 | Industrial Landfill | ND | **0.7** |
| CFSGS-018 | 6/3/2016 | Industrial Landfill | ND | ND |
| CFSGS-019 | 6/3/2016 | Industrial Landfill | ND | ND |
| CFSGS-020 | 6/3/2016 | Industrial Landfill | ND | **0.3** |
| CFSGS-021 | 6/3/2016 | Industrial Landfill | ND | **0.1** |
| CFSGS-022 | 6/3/2016 | Industrial Landfill | ND | **0.1** |
| CFSGS-034 | 4/20/2016 | West Landfill Vent | ND | ND |
| CFSGS-035 | 4/20/2016 | West Landfill Vent | ND | ND |
| CFSGS-036 | 4/20/2016 | West Landfill Vent | ND | ND |
| CFSGS-037 | 4/20/2016 | West Landfill Vent | ND | ND |
| CFSGS-038 | 4/20/2016 | West Landfill Vent | ND | ND |
| CFSGS-039 | 4/20/2016 | West Landfill Vent | ND | ND |
| CFSGS-040 | 4/20/2016 | West Landfill Vent | ND | ND |
| CFSGS-041 | 4/20/2016 | West Landfill Vent | **0.1** | ND |
| CFSGS-042 | 4/20/2016 | West Landfill Vent | ND | ND |
| CFSGS-043 | 4/20/2016 | West Landfill Vent | ND | ND |

BOLD - indicates the compound was detected
ppm - parts per million
% LEL - pecent lower explosive limit

**Table 7. Passive Soil Gas Sampling Data**
**Columbia Falls Aluminum Company, LLC, Phase I Site Characterization, 2000 Aluminum Drive, Columbia Falls, MT**

| Sample Location: | | CFSGP-016 | CFSGP-017 | CFSGP-023 | CFSGP-024 | CFSGP-025 | CFSGP-026 | CFSGP-027 | CFSGP-028 |
|---|---|---|---|---|---|---|---|---|---|
| Sample Date: | | 4/19/2016 - 4/23/2016 | 4/19/2016 - 4/23/2016 | 4/19/2016 - 4/23/2016 | 4/19/2016 - 4/23/2016 | 4/19/2016 - 4/23/2016 | 4/19/2016 - 4/23/2016 | 4/19/2016 - 4/23/2016 | 4/19/2016 - 4/23/2016 |
| Sample Depth (ft-bls): | | 4 - 4.5 | 3.5 - 4 | 3 - 3.5 | 3.5 - 4 | 3.5 - 4 | 3.5 - 4 | 3 - 3.5 | 2.5 - 3 |
| Sample Designation: | | CFSGP-016-SG-4-4.5 | CFSGP-017-SG-3.5-4 | CFSGP-023-SG-3-3.5 | CFSGP-024-SG-3.5-4 | CFSGP-025-SG-3.5-4 | CFSGP-026-SG-3.5-4 | CFSGP-027-SG-3-3.5 | CFSGP-028-SG-2.5-3 |
| Sample Area: | | Operational Grid | Operational Grid | Drum Storage Area | Drum Storage Area | Drum Storage Area | Drum Storage Area | Drum Storage Area | Drum Storage Area |
| Parameter | Units | | | | | | | | |
| 1-1-1-2-Tetrachloroethane | µg | <0.02 | <0.02 | <0.02 | <0.02 | <0.02 | <0.02 | <0.02 | <0.02 |
| 1-1-1-Trichloroethane | µg | <0.02 | <0.02 | <0.02 | <0.02 | <0.02 | <0.02 | <0.02 | <0.02 |
| 1-1-2-2-Tetrachloroethane | µg | <0.02 | <0.02 | <0.02 | <0.02 | <0.02 | <0.02 | <0.02 | <0.02 |
| 1-1-2-Trichloroethane | µg | <0.02 | <0.02 | <0.02 | <0.02 | <0.02 | <0.02 | <0.02 | <0.02 |
| 1-1-Dichloroethane | µg | <0.02 | <0.02 | <0.02 | <0.02 | <0.02 | <0.02 | <0.02 | <0.02 |
| 1-2-4-Trimethylbenzene | µg | <0.02 | <0.02 | <0.02 | <0.02 | <0.02 | <0.02 | <0.02 | <0.02 |
| 1-2-Dichlorobenzene | µg | <0.02 | <0.02 | <0.02 | <0.02 | <0.02 | <0.02 | <0.02 | <0.02 |
| 1-2-Dichloroethane | µg | <0.02 | <0.02 | <0.02 | <0.02 | <0.02 | <0.02 | <0.02 | <0.02 |
| 1-3-5-Trimethylbenzene | µg | <0.02 | <0.02 | <0.02 | <0.02 | <0.02 | <0.02 | <0.02 | <0.02 |
| 1-3-Dichlorobenzene | µg | <0.02 | <0.02 | <0.02 | <0.02 | <0.02 | <0.02 | <0.02 | <0.02 |
| 1-4-Dichlorobenzene | µg | <0.02 | <0.02 | <0.02 | <0.02 | <0.02 | <0.02 | <0.02 | <0.02 |
| 2-Methylnaphthalene | µg | <0.05 | <0.05 | <0.05 | <0.05 | <0.05 | <0.05 | <0.05 | <0.05 |
| Acenaphthene | µg | <0.05 | <0.05 | <0.05 | <0.05 | <0.05 | <0.05 | <0.05 | <0.05 |
| Acenaphthylene | µg | <0.05 | <0.05 | <0.05 | <0.05 | <0.05 | <0.05 | <0.05 | <0.05 |
| Benzene | µg | **0.21** | <0.02 | <0.02 | **0.02** | **0.04** | **0.05** | <0.02 | <0.02 |
| BTEX | µg | **0.26** | <0.02 | <0.02 | **0.02** | **0.04** | **0.05** | <0.02 | <0.02 |
| Carbon Tetrachloride | µg | <0.02 | <0.02 | <0.02 | <0.02 | <0.02 | <0.02 | <0.02 | <0.02 |
| Chlorobenzene | µg | <0.02 | <0.02 | <0.02 | <0.02 | <0.02 | <0.02 | <0.02 | <0.02 |
| Chloroform | µg | <0.02 | <0.02 | <0.02 | <0.02 | <0.02 | <0.02 | <0.02 | <0.02 |
| cis-1-2-Dichloroethene | µg | <0.02 | <0.02 | <0.02 | <0.02 | <0.02 | <0.02 | <0.02 | <0.02 |
| Ethylbenzene | µg | <0.02 | <0.02 | <0.02 | <0.02 | <0.02 | <0.02 | <0.02 | <0.02 |
| Fluorene | µg | <0.05 | <0.05 | <0.05 | <0.05 | <0.05 | <0.05 | <0.05 | <0.05 |
| m-p-Xylene | µg | <0.02 | <0.02 | <0.02 | <0.02 | <0.02 | <0.02 | <0.02 | <0.02 |
| Methyl tert-butyl ether | µg | <0.02 | <0.02 | <0.02 | <0.02 | <0.02 | <0.02 | <0.02 | <0.02 |
| Naphthalene | µg | <0.05 | **0.05** | <0.05 | <0.05 | <0.05 | <0.05 | <0.05 | <0.05 |
| o-Xylene | µg | <0.02 | <0.02 | <0.02 | <0.02 | <0.02 | <0.02 | <0.02 | <0.02 |
| Octane | µg | <0.02 | <0.02 | <0.02 | <0.02 | <0.02 | <0.02 | <0.02 | <0.02 |
| Pentadecane | µg | <0.05 | <0.05 | **0.09** | <0.05 | <0.05 | <0.05 | <0.05 | <0.05 |
| Tetrachloroethene | µg | <0.02 | <0.02 | <0.02 | <0.02 | <0.02 | <0.02 | **0.07** | **0.07** |
| Toluene | µg | **0.05** | <0.02 | <0.02 | <0.02 | <0.02 | <0.02 | <0.02 | <0.02 |
| trans-1-2-Dichloroethene | µg | <0.02 | <0.02 | <0.02 | <0.02 | <0.02 | <0.02 | <0.02 | <0.02 |
| Trichloroethene | µg | <0.02 | <0.02 | <0.02 | <0.02 | <0.02 | <0.02 | <0.02 | <0.02 |
| Tridecane | µg | <0.05 | <0.05 | <0.05 | <0.05 | <0.05 | <0.05 | <0.05 | <0.05 |
| Undecane | µg | <0.05 | <0.05 | **0.09** | <0.05 | <0.05 | <0.05 | <0.05 | <0.05 |

BOLD - indicates the compound was detected
Results are reported in micrograms (ug) relative mass value
< - indicates the value is below the limit of detecction and reporting limit
ft bls - Feet below land surface
µg - Micrograms

**Table 7. Passive Soil Gas Sampling Data**
**Columbia Falls Aluminum Company, LLC, Phase I Site Characterization, 2000 Aluminum Drive, Columbia Falls, MT**

| | Sample Location: | CFSGP-029 | CFSGP-030 |
|---|---|---|---|
| | Sample Date: | 4/19/2016 - 4/23/2016 | 4/18/2016 - 4/23/2016 |
| | Sample Depth (ft-bls): | 3.5 - 4 | 3 - 3.5 |
| | Sample Designation: | CFSGP-029-SG-3.5-4 | CFSGP-030-SG-3-3.5 |
| | Sample Area: | Drum Storage Area | Drum Storage Area |
| Parameter | Units | | |
| 1-1-1-2-Tetrachloroethane | µg | <0.02 | <0.02 |
| 1-1-1-Trichloroethane | µg | <0.02 | <0.02 |
| 1-1-2-2-Tetrachloroethane | µg | <0.02 | <0.02 |
| 1-1-2-Trichloroethane | µg | <0.02 | <0.02 |
| 1-1-Dichloroethane | µg | <0.02 | <0.02 |
| 1-2-4-Trimethylbenzene | µg | <0.02 | <0.02 |
| 1-2-Dichlorobenzene | µg | <0.02 | <0.02 |
| 1-2-Dichloroethane | µg | <0.02 | <0.02 |
| 1-3-5-Trimethylbenzene | µg | <0.02 | <0.02 |
| 1-3-Dichlorobenzene | µg | <0.02 | <0.02 |
| 1-4-Dichlorobenzene | µg | <0.02 | <0.02 |
| 2-Methylnaphthalene | µg | <0.05 | <0.05 |
| Acenaphthene | µg | <0.05 | <0.05 |
| Acenaphthylene | µg | <0.05 | <0.05 |
| Benzene | µg | **0.03** | <0.02 |
| BTEX | µg | **0.03** | <0.02 |
| Carbon Tetrachloride | µg | <0.02 | <0.02 |
| Chlorobenzene | µg | <0.02 | <0.02 |
| Chloroform | µg | <0.02 | <0.02 |
| cis-1-2-Dichloroethene | µg | <0.02 | <0.02 |
| Ethylbenzene | µg | <0.02 | <0.02 |
| Fluorene | µg | <0.05 | <0.05 |
| m-p-Xylene | µg | <0.02 | <0.02 |
| Methyl tert-butyl ether | µg | <0.02 | <0.02 |
| Naphthalene | µg | <0.05 | <0.05 |
| o-Xylene | µg | <0.02 | <0.02 |
| Octane | µg | <0.02 | <0.02 |
| Pentadecane | µg | <0.05 | <0.05 |
| Tetrachloroethene | µg | **0.15** | **2.3** |
| Toluene | µg | <0.02 | <0.02 |
| trans-1-2-Dichloroethene | µg | <0.02 | <0.02 |
| Trichloroethene | µg | <0.02 | <0.02 |
| Tridecane | µg | <0.05 | **0.84** |
| Undecane | µg | <0.05 | **0.12** |

BOLD - indicates the compound was det
Results are reported in micrograms (ug)
< - indicates the value is below the limit
ft bls - Feet below land surface
µg - Micrograms

**Table 8. Site-wide Surface Soil Analytical Results Statistical Summary**
**Columbia Falls Aluminum Company, LLC, Phase I Site Characterization, 2000 Aluminum Drive, Columbia Falls, MT**



| | | | | | | | | | | | | | | | Industrial RSL | | | Residential RSL | | | Risk SSL | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Group | Analyte | Matrix | Fraction | No. of Results | Unit | Min | Max | Mean | Median | Standard Deviation | 5th Percentile | 95th Percentile | # > LOD | % > LOD | No. Exceeding | % Exceeding | Action Level | No. Exceeding | % Exceeding | Action Level | No. Exceeding | % Exceeding | Action Level |
| DIOXINFURAN | 1,2,3,4,6,7,8-HpCDD | SO | N | 13 | mg/kg | <2.3E-08 | 0.000111 | 0.00 | 0.00 | 0.00 | n.d. | 0.00 | 11 | 85 | - | - | - | - | - | - | - | - | - |
| DIOXINFURAN | 1,2,3,4,6,7,8-HpCDF | SO | N | 13 | mg/kg | <2.7E-08 | 0.0000269 | 0.00 | 0.00 | 0.00 | n.d. | 0.00 | 11 | 85 | - | - | - | - | - | - | - | - | - |
| DIOXINFURAN | 1,2,3,4,7,8,9-HpCDF | SO | N | 13 | mg/kg | <3.4E-08 | 0.00000177 | 0.00 | n.d. | 0.00 | n.d. | 0.00 | 5 | 38 | - | - | - | - | - | - | - | - | - |
| DIOXINFURAN | 1,2,3,4,7,8-HxCDD | SO | N | 13 | mg/kg | <3E-08 | 0.00000342 | 0.00 | 0.00 | 0.00 | n.d. | 0.00 | 8 | 62 | - | - | - | - | - | - | - | - | - |
| DIOXINFURAN | 1,2,3,4,7,8-HxCDF | SO | N | 13 | mg/kg | <2.3E-08 | 0.00000307 | 0.00 | 0.00 | 0.00 | n.d. | 0.00 | 8 | 62 | - | - | - | - | - | - | - | - | - |
| DIOXINFURAN | 1,2,3,6,7,8-HxCDD | SO | N | 13 | mg/kg | <2.9E-08 | 0.00000507 | 0.00 | 0.00 | 0.00 | n.d. | 0.00 | 11 | 85 | - | - | - | - | - | - | - | - | - |
| DIOXINFURAN | 1,2,3,6,7,8-HxCDF | SO | N | 13 | mg/kg | <2.1E-07 | 0.00000105 | 0.00 | 0.00 | 0.00 | n.d. | 0.00 | 10 | 77 | - | - | - | - | - | - | - | - | - |
| DIOXINFURAN | 1,2,3,7,8,9-HxCDD | SO | N | 13 | mg/kg | <2.6E-08 | 0.0000046 | 0.00 | 0.00 | 0.00 | n.d. | 0.00 | 11 | 85 | - | - | - | - | - | - | - | - | - |
| DIOXINFURAN | 1,2,3,7,8,9-HxCDF | SO | N | 13 | mg/kg | <2.4E-08 | <4.7E-07 | n.d. | n.d. | n.d. | n.d. | n.d. | 0 | 0 | - | - | - | - | - | - | - | - | - |
| DIOXINFURAN | 1,2,3,7,8-PeCDD | SO | N | 13 | mg/kg | <3.5E-08 | 0.00000121 | 0.00 | n.d. | 0.00 | n.d. | 0.00 | 3 | 23 | - | - | - | - | - | - | - | - | - |
| DIOXINFURAN | 1,2,3,7,8-PeCDF | SO | N | 13 | mg/kg | <2.8E-08 | 0.00000159 | 0.00 | n.d. | 0.00 | n.d. | 0.00 | 6 | 46 | - | - | - | - | - | - | - | - | - |
| DIOXINFURAN | 2,3,4,6,7,8-HxCDF | SO | N | 13 | mg/kg | <2.3E-08 | 0.0000017 | 0.00 | n.d. | 0.00 | n.d. | 0.00 | 6 | 46 | - | - | - | - | - | - | - | - | - |
| DIOXINFURAN | 2,3,4,7,8-PeCDF | SO | N | 13 | mg/kg | <2.9E-08 | 0.00000171 | 0.00 | n.d. | 0.00 | n.d. | 0.00 | 6 | 46 | - | - | - | - | - | - | - | - | - |
| DIOXINFURAN | 2,3,7,8-TCDD | SO | N | 13 | mg/kg | <2.2E-08 | 0.00000058 | 0.00 | n.d. | 0.00 | n.d. | 0.00 | 3 | 23 | 0 | 0 | 0.000022 | 0 | 0 | 0.0000048 | 3 | 23 | 0.000000059 |
| DIOXINFURAN | 2,3,7,8-TCDF | SO | N | 13 | mg/kg | <1.9E-08 | 0.00000526 | 0.00 | 0.00 | 0.00 | n.d. | 0.00 | 10 | 77 | - | - | - | - | - | - | - | - | - |
| DIOXINFURAN | OCDD | SO | N | 13 | mg/kg | <2.2E-08 | 0.00173 | 0.00 | 0.00 | 0.00 | n.d. | 0.00 | 11 | 85 | - | - | - | - | - | - | - | - | - |
| DIOXINFURAN | OCDF | SO | N | 13 | mg/kg | <2.1E-08 | 0.0000972 | 0.00 | 0.00 | 0.00 | n.d. | 0.00 | 11 | 85 | - | - | - | - | - | - | - | - | - |
| DIOXINFURAN | Total HpCDD | SO | N | 13 | mg/kg | 0.00000053 | 0.0002 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 13 | 100 | - | - | - | - | - | - | - | - | - |
| DIOXINFURAN | Total HpCDF | SO | N | 13 | mg/kg | 0.00000026 | 0.0000873 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 13 | 100 | - | - | - | - | - | - | - | - | - |
| DIOXINFURAN | Total HxCDD | SO | N | 13 | mg/kg | 0.000000062 | 0.0000398 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 13 | 100 | - | - | - | - | - | - | - | - | - |
| DIOXINFURAN | Total HxCDF | SO | N | 13 | mg/kg | 0.000000044 | 0.0000518 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 13 | 100 | - | - | - | - | - | - | - | - | - |
| DIOXINFURAN | Total PeCDD | SO | N | 13 | mg/kg | <3.5E-08 | 0.00000467 | 0.00 | n.d. | 0.00 | n.d. | 0.00 | 3 | 23 | - | - | - | - | - | - | - | - | - |
| DIOXINFURAN | Total PeCDF | SO | N | 13 | mg/kg | <3.1E-08 | 0.0000125 | 0.00 | 0.00 | 0.00 | n.d. | 0.00 | 11 | 85 | - | - | - | - | - | - | - | - | - |
| DIOXINFURAN | Total TCDD | SO | N | 13 | mg/kg | <2.2E-08 | 0.00000561 | 0.00 | 0.00 | 0.00 | n.d. | 0.00 | 8 | 62 | - | - | - | - | - | - | - | - | - |
| DIOXINFURAN | Total TCDF | SO | N | 13 | mg/kg | <1.9E-08 | 0.0000241 | 0.00 | 0.00 | 0.00 | n.d. | 0.00 | 12 | 92 | - | - | - | - | - | - | - | - | - |
| GENCHEM | Fluoride | SO | N | 136 | mg/kg | 0.36 | 571 | 56.14 | 29.65 | 76.02 | 1.67 | ### | 136 | 100 | 0.00 | 0 | 4700 | 2 | 1 | 310 | 97 | 71 | 12 |
| GENCHEM | Total Organic Carbon (1) | SO | T | 28 | mg/kg | 3920 | 183000 | 38794.64 | 26550.00 | ### | ### | ### | 28 | 100 | - | - | - | - | - | - | - | - | - |
| METALS | Aluminum | SO | T | 136 | mg/kg | 2570 | 106000 | 15723.01 | 13650.00 | ### | ### | ### | 136 | 100 | 0 | 0 | 110000 | 119 | 88 | 7700 | 135 | 99 | 3000 |
| METALS | Antimony | SO | T | 136 | mg/kg | <0.28 | 2.6 | n.d. | n.d. | n.d. | n.d. | 2.15 | 8 | 6 | 0 | 0 | 47 | 0 | 0 | 3.1 | 8 | 6 | 0.035 |
| METALS | Arsenic | SO | T | 136 | mg/kg | <0.84 | 22.7 | 5.05 | 4.75 | 2.60 | 2.24 | 8.50 | 135 | 99 | 118 | 87 | 3 | 134 | 99 | 0.68 | 135 | 99 | 0.0015 |
| METALS | Barium | SO | T | 136 | mg/kg | 38 | 972 | 169.93 | 113.50 | ### | 55.05 | ### | 136 | 100 | 0 | 0 | 22000 | 0 | 0 | 1500 | 136 | 100 | 16 |
| METALS | Beryllium | SO | T | 136 | mg/kg | <0.11 | 17.2 | 0.70 | 0.50 | 1.48 | 0.26 | 1.14 | 134 | 99 | 0 | 0 | 230 | 1 | 1 | 16 | 3 | 2 | 1.9 |
| METALS | Cadmium | SO | T | 136 | mg/kg | <0.24 | 8.3 | n.d. | n.d. | n.d. | n.d. | 3.84 | 20 | 15 | 0 | 0 | 98 | 1 | 1 | 7.1 | 20 | 15 | 0.069 |
| METALS | Calcium | SO | T | 136 | mg/kg | 1370 | 313000 | 27863.01 | 17400.00 | ### | ### | ### | 136 | 100 | - | - | - | - | - | - | - | - | - |
| METALS | Chromium | SO | T | 136 | mg/kg | 2.6 | 84.8 | 12.50 | 10.30 | 10.17 | 6.40 | 22.65 | 136 | 100 | - | - | - | - | - | - | - | - | - |
| METALS | Cobalt | SO | T | 136 | mg/kg | <1.4 | 27.4 | 5.37 | 5.20 | 2.32 | 3.37 | 7.53 | 135 | 99 | 0 | 0 | 35 | 133 | 98 | 2.3 | 135 | 99 | 0.027 |

**Table 8. Site-wide Surface Soil Analytical Results Statistical Summary**
**Columbia Falls Aluminum Company, LLC, Phase I Site Characterization, 2000 Aluminum Drive, Columbia Falls, MT**

| | | | | | | | | | | | | | | | Industrial RSL | | | Residential RSL | | | Risk SSL | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Group | Analyte | Matrix | Fraction | No. of Results | Unit | Min | Max | Mean | Median | Standard Deviation | 5th Percentile | 95th Percentile | # > LOD | % > LOD | No. Exceeding | % Exceeding | Action Level | No. Exceeding | % Exceeding | Action Level | No. Exceeding | % Exceeding | Action Level |
| METALS | Copper | SO | T | 136 | mg/kg | 6.7 | 7260 | 72.84 | 14.50 | ### | 8.90 | 47.02 | 136 | 100 | 1 | 1 | 4700 | 1 | 1 | 310 | 136 | 100 | 2.8 |
| METALS | Cyanide, Total | SO | T | 136 | mg/kg | <0.015 | 137 | 1.42 | 0.09 | 11.78 | n.d. | 1.48 | 126 | 93 | 1 | 1 | 15 | 5 | 4 | 2.3 | 126 | 93 | 0.0015 |
| METALS | Iron | SO | T | 136 | mg/kg | 1760 | 37100 | 13414.49 | 13500.00 | ### | ### | ### | 136 | 100 | 0 | 0 | 82000 | 131 | 96 | 5500 | 136 | 100 | 35 |
| METALS | Lead | SO | T | 164 | mg/kg | 3.4 | 238 | 19.41 | 12.80 | 28.68 | 6.20 | 45.65 | 164 | 100 | 0 | 0 | 800 | 0 | 0 | 400 | - | - | - |
| METALS | Magnesium | SO | T | 136 | mg/kg | 1090 | 27500 | 9352.57 | 9250.00 | ### | ### | ### | 136 | 100 | - | - | - | - | - | - | - | - | - |
| METALS | Manganese | SO | T | 136 | mg/kg | 14.8 | 1270 | 395.11 | 367.50 | ### | 59.38 | ### | 136 | 100 | 0.00 | 0 | 2600 | 119 | 88 | 180 | 136 | 100 | 2.8 |
| METALS | Mercury | SO | T | 136 | mg/kg | <0.012 | 0.14 | 0.02 | 0.02 | 0.02 | n.d. | 0.05 | 113 | 83 | 0 | 0 | 4.6 | 0 | 0 | 1.1 | 113 | 83 | 0.0033 |
| METALS | Nickel | SO | T | 136 | mg/kg | 4.4 | 1250 | 34.59 | 14.15 | ### | 8.90 | 82.48 | 136 | 100 | 0.00 | 0 | 2200 | 4 | 3 | 150 | 136 | 100 | 2.6 |
| METALS | Potassium | SO | T | 136 | mg/kg | 238 | 1900 | 887.35 | 864.00 | ### | ### | ### | 136 | 100 | - | - | - | - | - | - | - | - | - |
| METALS | Selenium | SO | T | 136 | mg/kg | <0.26 | 3.3 | 0.18 | n.d. | 0.43 | n.d. | 1.51 | 31 | 23 | 0 | 0 | 580 | 0 | 0 | 39 | 31 | 23 | 0.052 |
| METALS | Silver | SO | T | 136 | mg/kg | <0.55 | 0.96 | n.d. | n.d. | n.d. | n.d. | n.d. | 1 | 1 | 0 | 0 | 580 | 0 | 0 | 39 | 1 | 1 | 0.08 |
| METALS | Sodium | SO | T | 136 | mg/kg | <29.7 | 2140 | 120.93 | 62.65 | ### | n.d. | ### | 99 | 73 | - | - | - | - | - | - | - | - | - |
| METALS | Thallium | SO | T | 136 | mg/kg | <0.11 | 4.6 | n.d. | n.d. | n.d. | n.d. | 4.44 | 10 | 7 | 2 | 1 | 1.2 | 10 | 7 | 0.078 | 10 | 7 | 0.0014 |
| METALS | Vanadium | SO | T | 136 | mg/kg | 3.2 | 348 | 17.19 | 12.05 | 31.56 | 6.00 | 27.47 | 136 | 100 | 0 | 0 | 580 | 5 | 4 | 39 | 109 | 80 | 8.6 |
| METALS | Zinc | SO | T | 136 | mg/kg | 13.6 | 265 | 64.09 | 48.55 | 45.25 | 27.70 | ### | 136 | 100 | 0 | 0 | 35000 | 0 | 0 | 2300 | 113 | 83 | 37 |
| OC_PEST | 4,4'-DDD | SO | N | 69 | mg/kg | <0.00094 | <0.0023 | n.d. | n.d. | n.d. | n.d. | n.d. | 0 | 0 | 0 | 0 | 9.6 | 0 | 0 | 2.3 | 0 | 0 | 0.0075 |
| OC_PEST | 4,4'-DDE | SO | N | 69 | mg/kg | <0.001 | <0.0025 | n.d. | n.d. | n.d. | n.d. | n.d. | 0 | 0 | 0 | 0 | 9.3 | 0 | 0 | 2 | 0 | 0 | 0.011 |
| OC_PEST | 4,4'-DDT | SO | N | 69 | mg/kg | <0.00073 | <0.0018 | n.d. | n.d. | n.d. | n.d. | n.d. | 0 | 0 | 0 | 0 | 8.5 | 0 | 0 | 1.9 | 0 | 0 | 0.077 |
| OC_PEST | Aldrin | SO | N | 69 | mg/kg | <0.00086 | <0.0021 | n.d. | n.d. | n.d. | n.d. | n.d. | 0 | 0 | 0 | 0 | 0.18 | 0 | 0 | 0.039 | 0 | 0 | 0.00015 |
| OC_PEST | alpha-BHC | SO | N | 69 | mg/kg | <0.00065 | <0.0016 | n.d. | n.d. | n.d. | n.d. | n.d. | 0 | 0 | 0 | 0 | 0.36 | 0 | 0 | 0.086 | 0 | 0 | 0.000042 |
| OC_PEST | alpha-Chlordane | SO | N | 69 | mg/kg | <0.0012 | <0.0028 | n.d. | n.d. | n.d. | n.d. | n.d. | 0 | 0 | - | - | - | - | - | - | - | - | - |
| OC_PEST | beta-BHC | SO | N | 69 | mg/kg | <0.00069 | <0.0017 | n.d. | n.d. | n.d. | n.d. | n.d. | 0 | 0 | 0 | 0 | 1.3 | 0 | 0 | 0.3 | 0 | 0 | 0.00015 |
| OC_PEST | delta-BHC | SO | N | 69 | mg/kg | <0.00078 | <0.0019 | n.d. | n.d. | n.d. | n.d. | n.d. | 0 | 0 | - | - | - | - | - | - | - | - | - |
| OC_PEST | Dieldrin | SO | N | 68 | mg/kg | <0.00093 | <0.0022 | n.d. | n.d. | n.d. | n.d. | n.d. | 0 | 0 | 0 | 0 | 0.14 | 0 | 0 | 0.034 | 0 | 0 | 0.000071 |
| OC_PEST | Endosulfan I | SO | N | 69 | mg/kg | <0.00099 | <0.0024 | n.d. | n.d. | n.d. | n.d. | n.d. | 0 | 0 | - | - | - | - | - | - | - | - | - |
| OC_PEST | Endosulfan II | SO | N | 69 | mg/kg | <0.0011 | <0.0027 | n.d. | n.d. | n.d. | n.d. | n.d. | 0 | 0 | - | - | - | - | - | - | - | - | - |
| OC_PEST | Endosulfan sulfate | SO | N | 69 | mg/kg | <0.00083 | <0.002 | n.d. | n.d. | n.d. | n.d. | n.d. | 0 | 0 | - | - | - | - | - | - | - | - | - |
| OC_PEST | Endrin | SO | N | 69 | mg/kg | <0.0009 | <0.0022 | n.d. | n.d. | n.d. | n.d. | n.d. | 0 | 0 | 0 | 0 | 25 | 0 | 0 | 1.9 | 0 | 0 | 0.0092 |
| OC_PEST | Endrin aldehyde | SO | N | 69 | mg/kg | <0.00088 | <0.0021 | n.d. | n.d. | n.d. | n.d. | n.d. | 0 | 0 | - | - | - | - | - | - | - | - | - |
| OC_PEST | Endrin ketone | SO | N | 69 | mg/kg | <0.00099 | <0.0024 | n.d. | n.d. | n.d. | n.d. | n.d. | 0 | 0 | - | - | - | - | - | - | - | - | - |
| OC_PEST | gamma-BHC (Lindane) | SO | N | 69 | mg/kg | <0.00064 | <0.0015 | n.d. | n.d. | n.d. | n.d. | n.d. | 0 | 0 | 0 | 0 | 2.5 | 0 | 0 | 0.57 | 0 | 0 | 0.00024 |
| OC_PEST | gamma-Chlordane | SO | N | 69 | mg/kg | <0.0015 | <0.0037 | n.d. | n.d. | n.d. | n.d. | n.d. | 0 | 0 | - | - | - | - | - | - | - | - | - |
| OC_PEST | Heptachlor | SO | N | 69 | mg/kg | <0.00092 | <0.0022 | n.d. | n.d. | n.d. | n.d. | n.d. | 0 | 0 | 0 | 0 | 0.63 | 0 | 0 | 0.13 | 0 | 0 | 0.00012 |
| OC_PEST | Heptachlor epoxide | SO | N | 69 | mg/kg | <0.0014 | <0.0034 | n.d. | n.d. | n.d. | n.d. | n.d. | 0 | 0 | 0 | 0 | 0.33 | 0 | 0 | 0.07 | 0 | 0 | 0.000028 |
| OC_PEST | Methoxychlor | SO | N | 69 | mg/kg | <0.0015 | <0.0036 | n.d. | n.d. | n.d. | n.d. | n.d. | 0 | 0 | 0 | 0 | 410 | 0 | 0 | 32 | 0 | 0 | 0.2 |
| OC_PEST | Toxaphene | SO | N | 69 | mg/kg | <0.021 | <0.05 | n.d. | n.d. | n.d. | n.d. | n.d. | 0 | 0 | 0 | 0 | 2.1 | 0 | 0 | 0.49 | 0 | 0 | 0.011 |

**Table 8. Site-wide Surface Soil Analytical Results Statistical Summary**
**Columbia Falls Aluminum Company, LLC, Phase I Site Characterization, 2000 Aluminum Drive, Columbia Falls, MT**

| | | | | | | | | | | | | | | | Industrial RSL | | | Residential RSL | | | Risk SSL | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Group | Analyte | Matrix | Fraction | No. of Results | Unit | Min | Max | Mean | Median | Standard Deviation | 5th Percentile | 95th Percentile | # > LOD | % > LOD | No. Exceeding | % Exceeding | Action Level | No. Exceeding | % Exceeding | Action Level | No. Exceeding | % Exceeding | Action Level |
| PCB | Aroclor 1016 | SO | N | 136 | mg/kg | <0.0093 | <0.023 | n.d. | n.d. | n.d. | n.d. | n.d. | 0 | 0 | 0 | 0 | 5.1 | 0 | 0 | 0.41 | 0 | 0 | 0.013 |
| PCB | Aroclor 1221 | SO | N | 136 | mg/kg | <0.0093 | <0.023 | n.d. | n.d. | n.d. | n.d. | n.d. | 0 | 0 | 0.00 | 0 | 0.83 | 0 | 0 | 0.2 | 0 | 0 | 0.00008 |
| PCB | Aroclor 1232 | SO | N | 136 | mg/kg | <0.0093 | <0.023 | n.d. | n.d. | n.d. | n.d. | n.d. | 0 | 0 | 0.00 | 0 | 0.72 | 0 | 0 | 0.17 | 0 | 0 | 0.00008 |
| PCB | Aroclor 1242 | SO | N | 136 | mg/kg | <0.0093 | <0.023 | n.d. | n.d. | n.d. | n.d. | n.d. | 0 | 0 | 0.00 | 0 | 0.95 | 0 | 0 | 0.23 | 0 | 0 | 0.0012 |
| PCB | Aroclor 1248 | SO | N | 136 | mg/kg | <0.0093 | <0.023 | n.d. | n.d. | n.d. | n.d. | n.d. | 0 | 0 | 0 | 0 | 0.95 | 0 | 0 | 0.23 | 0 | 0 | 0.0012 |
| PCB | Aroclor 1254 | SO | N | 136 | mg/kg | <0.0096 | <0.024 | n.d. | n.d. | n.d. | n.d. | n.d. | 0 | 0 | 0 | 0 | 0.97 | 0 | 0 | 0.12 | 0 | 0 | 0.002 |
| PCB | Aroclor 1260 | SO | N | 136 | mg/kg | <0.0096 | <0.024 | n.d. | n.d. | n.d. | n.d. | n.d. | 0 | 0 | 0 | 0 | 0.99 | 0 | 0 | 0.24 | 0 | 0 | 0.0055 |
| PCB | Aroclor 1268 | SO | N | 136 | mg/kg | <0.0096 | <0.024 | n.d. | n.d. | n.d. | n.d. | n.d. | 0 | 0 | - | - | - | - | - | - | - | - | - |
| PCB | Aroclor-1262 | SO | N | 136 | mg/kg | <0.0096 | <0.024 | n.d. | n.d. | n.d. | n.d. | n.d. | 0 | 0 | - | - | - | - | - | - | - | - | - |
| PCB | Polychlorinated biphenyls, Total | SO | N | 136 | mg/kg | <0.0096 | <0.024 | n.d. | n.d. | n.d. | n.d. | n.d. | 0 | 0 | 0.00 | 0 | 0.94 | 0 | 0 | 0.23 | 0 | 0 | 0.0068 |
| SVOC | 1,1'-Biphenyl | SO | N | 136 | mg/kg | <0.029 | 0.072 | n.d. | n.d. | n.d. | n.d. | n.d. | 3 | 2 | 0 | 0 | 20 | 0 | 0 | 4.7 | 3 | 2 | 0.00087 |
| SVOC | 1,2,4,5-Tetrachlorobenzene | SO | N | 136 | mg/kg | <0.026 | <3.6 | n.d. | n.d. | n.d. | n.d. | n.d. | 0 | 0 | 0 | 0 | 35 | 0 | 0 | 2.3 | 0 | 0 | 0.00079 |
| SVOC | 1,4-Dioxane | SO | N | 136 | mg/kg | <0.092 | <13 | n.d. | n.d. | n.d. | n.d. | n.d. | 0 | 0 | 0 | 0 | 24 | 0 | 0 | 5.3 | 0 | 0 | 0.000094 |
| SVOC | 2,2'-oxybis[1-chloropropane] | SO | N | 136 | mg/kg | <0.014 | <2 | n.d. | n.d. | n.d. | n.d. | n.d. | 0 | 0 | 0 | 0 | 4700 | 0 | 0 | 310 | 0 | 0 | 0.026 |
| SVOC | 2,3,4,6-Tetrachlorophenol | SO | N | 136 | mg/kg | <0.032 | <4.5 | n.d. | n.d. | n.d. | n.d. | n.d. | 0 | 0 | 0.00 | 0 | 2500 | 0 | 0 | 190 | 0 | 0 | 0.018 |
| SVOC | 2,4,5-Trichlorophenol | SO | N | 136 | mg/kg | <0.034 | <4.8 | n.d. | n.d. | n.d. | n.d. | n.d. | 0 | 0 | 0 | 0 | 8200 | 0 | 0 | 630 | 0 | 0 | 0.4 |
| SVOC | 2,4,6-Trichlorophenol | SO | N | 136 | mg/kg | <0.0098 | <1.4 | n.d. | n.d. | n.d. | n.d. | n.d. | 0 | 0 | 0.00 | 0 | 82 | 0 | 0 | 6.3 | 0 | 0 | 0.0012 |
| SVOC | 2,4-Dichlorophenol | SO | N | 136 | mg/kg | <0.0081 | <1.1 | n.d. | n.d. | n.d. | n.d. | n.d. | 0 | 0 | 0.00 | 0 | 250 | 0 | 0 | 19 | 0 | 0 | 0.0023 |
| SVOC | 2,4-Dimethylphenol | SO | N | 136 | mg/kg | <0.076 | <11 | n.d. | n.d. | n.d. | n.d. | n.d. | 0 | 0 | 0 | 0 | 1600 | 0 | 0 | 130 | 0 | 0 | 0.042 |
| SVOC | 2,4-Dinitrophenol | SO | N | 135 | mg/kg | <0.26 | <37 | n.d. | n.d. | n.d. | n.d. | n.d. | 0 | 0 | 0 | 0 | 160 | 0 | 0 | 13 | 0 | 0 | 0.0044 |
| SVOC | 2,4-Dinitrotoluene | SO | N | 136 | mg/kg | <0.014 | <1.9 | n.d. | n.d. | n.d. | n.d. | n.d. | 0 | 0 | 0 | 0 | 7.4 | 0 | 0 | 1.7 | 0 | 0 | 0.00032 |
| SVOC | 2,6-Dinitrotoluene | SO | N | 136 | mg/kg | <0.018 | <2.6 | n.d. | n.d. | n.d. | n.d. | n.d. | 0 | 0 | 0 | 0 | 1.5 | 0 | 0 | 0.36 | 0 | 0 | 0.000067 |
| SVOC | 2-Chloronaphthalene | SO | N | 136 | mg/kg | <0.0078 | <1.1 | n.d. | n.d. | n.d. | n.d. | n.d. | 0 | 0 | 0 | 0 | 6000 | 0 | 0 | 480 | 0 | 0 | 0.39 |
| SVOC | 2-Chlorophenol | SO | N | 136 | mg/kg | <0.0087 | <1.2 | n.d. | n.d. | n.d. | n.d. | n.d. | 0 | 0 | 0 | 0 | 580 | 0 | 0 | 39 | 0 | 0 | 0.0089 |
| SVOC | 2-Methylnaphthalene | SO | N | 136 | mg/kg | <0.0076 | 3.6 | 0.13 | n.d. | 0.50 | n.d. | 1.82 | 54 | 40 | 0 | 0 | 300 | 0 | 0 | 24 | 38 | 28 | 0.019 |
| SVOC | 2-Methylphenol | SO | N | 136 | mg/kg | <0.015 | <2.1 | n.d. | n.d. | n.d. | n.d. | n.d. | 0 | 0 | 0 | 0 | 4100 | 0 | 0 | 320 | 0 | 0 | 0.075 |
| SVOC | 2-Nitroaniline | SO | N | 136 | mg/kg | <0.011 | <1.6 | n.d. | n.d. | n.d. | n.d. | n.d. | 0 | 0 | 0 | 0 | 800 | 0 | 0 | 63 | 0 | 0 | 0.008 |
| SVOC | 2-Nitrophenol | SO | N | 136 | mg/kg | <0.012 | <1.6 | n.d. | n.d. | n.d. | n.d. | n.d. | 0 | 0 | - | - | - | - | - | - | - | - | - |
| SVOC | 3 & 4 Methylphenol | SO | N | 136 | mg/kg | <0.0092 | 0.048 | n.d. | n.d. | n.d. | n.d. | n.d. | 4 | 3 | - | - | - | - | - | - | - | - | - |
| SVOC | 3,3'-Dichlorobenzidine | SO | N | 136 | mg/kg | <0.038 | <5.4 | n.d. | n.d. | n.d. | n.d. | n.d. | 0 | 0 | 0.00 | 0 | 5.1 | 0 | 0 | 1.2 | 0 | 0 | 0.00082 |
| SVOC | 3-Nitroaniline | SO | N | 136 | mg/kg | <0.01 | <1.4 | n.d. | n.d. | n.d. | n.d. | n.d. | 0 | 0 | - | - | - | - | - | - | - | - | - |
| SVOC | 4,6-Dinitro-2-methylphenol | SO | N | 136 | mg/kg | <0.092 | <13 | n.d. | n.d. | n.d. | n.d. | n.d. | 0 | 0 | 0 | 0 | 6.6 | 0 | 0 | 0.51 | 0 | 0 | 0.00026 |
| SVOC | 4-Bromophenyl phenyl ether | SO | N | 136 | mg/kg | <0.011 | <1.5 | n.d. | n.d. | n.d. | n.d. | n.d. | 0 | 0 | - | - | - | - | - | - | - | - | - |
| SVOC | 4-Chloro-3-methylphenol | SO | N | 136 | mg/kg | <0.015 | <2.1 | n.d. | n.d. | n.d. | n.d. | n.d. | 0 | 0 | 0.00 | 0 | 8200 | 0 | 0 | 630 | 0 | 0 | 0.17 |
| SVOC | 4-Chloroaniline | SO | N | 136 | mg/kg | <0.0088 | <1.2 | n.d. | n.d. | n.d. | n.d. | n.d. | 0 | 0 | 0 | 0 | 11 | 0 | 0 | 2.7 | 0 | 0 | 0.00016 |
| SVOC | 4-Chlorophenyl phenyl ether | SO | N | 136 | mg/kg | <0.01 | <1.4 | n.d. | n.d. | n.d. | n.d. | n.d. | 0 | 0 | - | - | - | - | - | - | - | - | - |

**Table 8. Site-wide Surface Soil Analytical Results Statistical Summary**
**Columbia Falls Aluminum Company, LLC, Phase I Site Characterization, 2000 Aluminum Drive, Columbia Falls, MT**

| Group | Analyte | Matrix | Fraction | No. of Results | Unit | Min | Max | Mean | Median | Standard Deviation | 5th Percentile | 95th Percentile | # > LOD | % > LOD | Industrial RSL | | | Residential RSL | | | Risk SSL | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | | | | | | | | No. Exceeding | % Exceeding | Action Level | No. Exceeding | % Exceeding | Action Level | No. Exceeding | % Exceeding | Action Level |
| SVOC | 4-Nitroaniline | SO | N | 136 | mg/kg | <0.013 | <1.8 | n.d. | n.d. | n.d. | n.d. | n.d. | 0 | 0 | 0 | 0 | 110 | 0 | 0 | 25 | 0 | 0 | 0.0016 |
| SVOC | 4-Nitrophenol | SO | N | 136 | mg/kg | <0.17 | <23 | n.d. | n.d. | n.d. | n.d. | n.d. | 0 | 0 | - | - | - | - | - | - | - | - | - |
| SVOC | Acenaphthene | SO | N | 136 | mg/kg | <0.0084 | 40 | 0.83 | 0.02 | 4.17 | n.d. | 5.22 | 84 | 62 | 0 | 0 | 4500 | 0 | 0 | 360 | 18 | 13 | 0.55 |
| SVOC | Acenaphthylene | SO | N | 136 | mg/kg | <0.0088 | 1.2 | n.d. | n.d. | n.d. | n.d. | 0.34 | 10 | 7 | - | - | - | - | - | - | - | - | - |
| SVOC | Acetophenone | SO | N | 136 | mg/kg | <0.0075 | 0.046 | n.d. | n.d. | n.d. | n.d. | n.d. | 6 | 4 | 0 | 0 | 12000 | 0 | 0 | 780 | 0 | 0 | 0.058 |
| SVOC | Anthracene | SO | N | 136 | mg/kg | <0.033 | 47 | 1.62 | 0.04 | 6.73 | n.d. | 21.40 | 73 | 54 | 0 | 0 | 23000 | 0 | 0 | 1800 | 7 | 5 | 5.8 |
| SVOC | Atrazine | SO | N | 136 | mg/kg | <0.015 | <2.2 | n.d. | n.d. | n.d. | n.d. | n.d. | 0 | 0 | 0 | 0 | 10 | 0 | 0 | 2.4 | 0 | 0 | 0.0002 |
| SVOC | Benzaldehyde | SO | N | 136 | mg/kg | <0.026 | 0.093 | n.d. | n.d. | n.d. | n.d. | 0.09 | 9 | 7 | 0 | 0 | 820 | 0 | 0 | 170 | 9 | 7 | 0.0041 |
| SVOC | Benzo[a]anthracene | SO | N | 136 | mg/kg | <0.03 | 280 | 7.65 | 0.26 | 32.37 | n.d. | 38.35 | 111 | 82 | 24 | 18 | 2.9 | 81 | 60 | 0.16 | 111 | 82 | 0.0042 |
| SVOC | Benzo[a]pyrene | SO | N | 136 | mg/kg | <0.011 | 320 | 7.96 | 0.37 | 33.55 | n.d. | 37.75 | 118 | 87 | 71 | 52 | 0.29 | 117 | 86 | 0.016 | 118 | 87 | 0.004 |
| SVOC | Benzo[b]fluoranthene | SO | N | 136 | mg/kg | <0.014 | 460 | 11.75 | 0.62 | 48.80 | n.d. | 46.20 | 122 | 90 | 34 | 25 | 2.9 | 102 | 75 | 0.16 | 116 | 85 | 0.041 |
| SVOC | Benzo[g,h,i]perylene | SO | N | 136 | mg/kg | <0.02 | 250 | 6.17 | 0.47 | 24.60 | n.d. | 33.40 | 117 | 86 | - | - | - | - | - | - | - | - | - |
| SVOC | Benzo[k]fluoranthene | SO | N | 136 | mg/kg | <0.016 | 150 | 4.25 | 0.19 | 16.82 | n.d. | 21.20 | 108 | 79 | 5 | 4 | 29 | 27 | 20 | 1.6 | 49 | 36 | 0.4 |
| SVOC | Bis(2-chloroethoxy)methane | SO | N | 136 | mg/kg | <0.011 | <1.5 | n.d. | n.d. | n.d. | n.d. | n.d. | 0 | 0 | 0.00 | 0 | 250 | 0 | 0 | 19 | 0 | 0 | 0.0013 |
| SVOC | Bis(2-chloroethyl)ether | SO | N | 136 | mg/kg | <0.0081 | 0.017 | n.d. | n.d. | n.d. | n.d. | n.d. | 1 | 1 | 0 | 0 | 1 | 0 | 0 | 0.23 | 1 | 1 | 0.0000036 |
| SVOC | Bis(2-ethylhexyl) phthalate | SO | N | 136 | mg/kg | <0.013 | 5.8 | 0.08 | n.d. | 0.52 | n.d. | 0.41 | 41 | 30 | 0 | 0 | 160 | 0 | 0 | 39 | 2 | 1 | 1.3 |
| SVOC | Butyl benzyl phthalate | SO | N | 136 | mg/kg | <0.011 | 5.6 | 0.10 | n.d. | 0.58 | n.d. | 3.11 | 23 | 17 | 0 | 0 | 1200 | 0 | 0 | 290 | 9 | 7 | 0.24 |
| SVOC | Caprolactam | SO | N | 136 | mg/kg | <0.025 | 0.066 | n.d. | n.d. | n.d. | n.d. | n.d. | 1 | 1 | 0 | 0 | 40000 | 0 | 0 | 3100 | 0 | 0 | 0.25 |
| SVOC | Carbazole | SO | N | 136 | mg/kg | <0.0088 | 33 | 1.04 | 0.06 | 4.29 | n.d. | 6.55 | 101 | 74 | - | - | - | - | - | - | - | - | - |
| SVOC | Chrysene | SO | N | 136 | mg/kg | <0.0097 | 350 | 10.64 | 0.44 | 44.33 | n.d. | 33.70 | 123 | 90 | 1 | 1 | 290 | 10 | 7 | 16 | 43 | 32 | 1.2 |
| SVOC | Dibenz(a,h)anthracene | SO | N | 136 | mg/kg | <0.018 | 70 | 1.71 | 0.10 | 7.05 | n.d. | 11.54 | 94 | 69 | 41 | 30 | 0.29 | 94 | 69 | 0.016 | 94 | 69 | 0.013 |
| SVOC | Dibenzofuran | SO | N | 136 | mg/kg | <0.01 | 10 | 0.28 | n.d. | 1.22 | n.d. | 4.06 | 63 | 46 | 0 | 0 | 100 | 1 | 1 | 7.3 | 54 | 40 | 0.015 |
| SVOC | Diethyl phthalate | SO | N | 136 | mg/kg | <0.0098 | <1.4 | n.d. | n.d. | n.d. | n.d. | n.d. | 0 | 0 | 0 | 0 | 66000 | 0 | 0 | 5100 | 0 | 0 | 0.61 |
| SVOC | Dimethyl phthalate | SO | N | 136 | mg/kg | <0.01 | <1.4 | n.d. | n.d. | n.d. | n.d. | n.d. | 0 | 0 | - | - | - | - | - | - | - | - | - |
| SVOC | Di-n-butyl phthalate | SO | N | 136 | mg/kg | <0.01 | 0.085 | 0.01 | n.d. | 0.02 | n.d. | 0.08 | 22 | 16 | 0 | 0 | 8200 | 0 | 0 | 630 | 0 | 0 | 0.23 |
| SVOC | Di-n-octyl phthalate | SO | N | 136 | mg/kg | <0.017 | 0.096 | n.d. | n.d. | n.d. | n.d. | n.d. | 1 | 1 | 0 | 0 | 820 | 0 | 0 | 63 | 0 | 0 | 5.7 |
| SVOC | Fluoranthene | SO | N | 136 | mg/kg | <0.011 | 430 | 13.76 | 0.47 | 56.04 | n.d. | 45.00 | 123 | 90 | 0 | 0 | 3000 | 3 | 2 | 240 | 19 | 14 | 8.9 |
| SVOC | Fluorene | SO | N | 136 | mg/kg | <0.0075 | 19 | 0.53 | 0.02 | 2.40 | n.d. | 4.98 | 77 | 57 | 0 | 0 | 3000 | 0 | 0 | 240 | 13 | 10 | 0.54 |
| SVOC | Hexachlorobenzene | SO | N | 136 | mg/kg | <0.014 | <2 | n.d. | n.d. | n.d. | n.d. | n.d. | 0 | 0 | 0 | 0 | 0.96 | 0 | 0 | 0.21 | 0 | 0 | 0.00012 |
| SVOC | Hexachlorobutadiene | SO | N | 136 | mg/kg | <0.0097 | <1.4 | n.d. | n.d. | n.d. | n.d. | n.d. | 0 | 0 | 0 | 0 | 5.3 | 0 | 0 | 1.2 | 0 | 0 | 0.00027 |
| SVOC | Hexachlorocyclopentadiene | SO | N | 136 | mg/kg | <0.021 | <3 | n.d. | n.d. | n.d. | n.d. | n.d. | 0 | 0 | 0 | 0 | 0.75 | 0 | 0 | 0.18 | 0 | 0 | 0.00013 |
| SVOC | Hexachloroethane | SO | N | 136 | mg/kg | <0.013 | <1.8 | n.d. | n.d. | n.d. | n.d. | n.d. | 0 | 0 | 0 | 0 | 8 | 0 | 0 | 1.8 | 0 | 0 | 0.0002 |
| SVOC | Indeno[1,2,3-cd]pyrene | SO | N | 136 | mg/kg | <0.024 | 260 | 6.48 | 0.43 | 25.89 | n.d. | 35.70 | 115 | 85 | 27 | 20 | 2.9 | 91 | 67 | 0.16 | 92 | 68 | 0.13 |
| SVOC | Isophorone | SO | N | 136 | mg/kg | <0.0074 | 0.25 | 0.01 | n.d. | 0.03 | n.d. | 0.08 | 21 | 15 | 0 | 0 | 2400 | 0 | 0 | 570 | 10 | 7 | 0.026 |
| SVOC | Naphthalene | SO | N | 136 | mg/kg | <0.0088 | 6.5 | 0.23 | 0.01 | 0.87 | n.d. | 3.48 | 69 | 51 | 0 | 0 | 17 | 3 | 2 | 3.8 | 69 | 51 | 0.00054 |
| SVOC | Nitrobenzene | SO | N | 136 | mg/kg | <0.011 | <1.5 | n.d. | n.d. | n.d. | n.d. | n.d. | 0 | 0 | 0.00 | 0 | 22 | 0 | 0 | 5.1 | 0 | 0 | 0.000092 |

**Table 8. Site-wide Surface Soil Analytical Results Statistical Summary**
**Columbia Falls Aluminum Company, LLC, Phase I Site Characterization, 2000 Aluminum Drive, Columbia Falls, MT**

| | | | | | | | | | | | | | | | Industrial RSL | | | Residential RSL | | | Risk SSL | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Group | Analyte | Matrix | Fraction | No. of Results | Unit | Min | Max | Mean | Median | Standard Deviation | 5th Percentile | 95th Percentile | # > LOD | % > LOD | No. Exceeding | % Exceeding | Action Level | No. Exceeding | % Exceeding | Action Level | No. Exceeding | % Exceeding | Action Level |
| SVOC | N-Nitrosodi-n-propylamine | SO | N | 136 | mg/kg | <0.012 | <1.6 | n.d. | n.d. | n.d. | n.d. | n.d. | 0 | 0 | 0 | 0 | 0.33 | 0 | 0 | 0.078 | 0 | 0 | 0.0000081 |
| SVOC | N-Nitrosodiphenylamine | SO | N | 136 | mg/kg | <0.031 | <4.4 | n.d. | n.d. | n.d. | n.d. | n.d. | 0 | 0 | 0 | 0 | 470 | 0 | 0 | 110 | 0 | 0 | 0.067 |
| SVOC | Pentachlorophenol | SO | N | 136 | mg/kg | <0.042 | 0.53 | n.d. | n.d. | n.d. | n.d. | n.d. | 2 | 1 | 0 | 0 | 4 | 0 | 0 | 1 | 2 | 1 | 0.000057 |
| SVOC | Phenanthrene | SO | N | 136 | mg/kg | <0.0095 | 200 | 6.56 | 0.25 | 26.61 | n.d. | 31.30 | 122 | 90 | - | - | - | - | - | - | - | - | - |
| SVOC | Phenol | SO | N | 136 | mg/kg | <0.011 | 0.016 | n.d. | n.d. | n.d. | n.d. | n.d. | 1 | 1 | 0.00 | 0 | 25000 | 0 | 0 | 1900 | 0 | 0 | 0.33 |
| SVOC | Pyrene | SO | N | 136 | mg/kg | <0.016 | 440 | 13.68 | 0.56 | 54.75 | n.d. | 57.00 | 121 | 89 | 0.00 | 0 | 2300 | 4 | 3 | 180 | 42 | 31 | 1.3 |

mg/kg - Milligrams per Kilograms
n.d - Non Detect
LOD - Limit of Detection
Industiral RSL - Environmental Protection Agency Industrial Soil Regional Screening Level
Residential RSL - Environmental Protection Agency Residnetial Soil Regional Screening Level
Risk SSL - Environmental Protection Agency Human Health Protection of Ground Water - Risk-based Soil Screening Level

**Table 9. Site-wide Shallow Soil Analytical Results Statistical Summary**
**Columbia Falls Aluminum Company, LLC, Phase I Site Characterization, 2000 Aluminum Drive, Columbia Falls, MT**

| | | | | | | | | | | | | | | | Industrial RSL | | | Residential RSL | | | Risk SSL | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Group | Analyte | Matrix | Fraction | No. of Results | Unit | Min | Max | Mean | Median | Standard Deviation | 5th Percentile | 95th Percentile | # > LOD | % > LOD | No. Exceeding | % Exceeding | Action Level | No. Exceeding | % Exceeding | Action Level | No. Exceeding | % Exceeding | Action Level |
| DIOXINFURAN | 1,2,3,4,6,7,8-HpCDD | SO | N | 13 | mg/kg | <1.8E-08 | 0.000312 | 0.00 | 0.00 | 0.00 | n.d. | 0.00 | 10 | 77 | - | - | - | - | - | - | - | - | - |
| DIOXINFURAN | 1,2,3,4,6,7,8-HpCDF | SO | N | 13 | mg/kg | <2E-08 | 0.0000664 | 0.00 | 0.00 | 0.00 | n.d. | 0.00 | 7 | 54 | - | - | - | - | - | - | - | - | - |
| DIOXINFURAN | 1,2,3,4,7,8,9-HpCDF | SO | N | 13 | mg/kg | <1.6E-08 | 0.000000041 | n.d. | n.d. | n.d. | n.d. | 0.00 | 1 | 8 | - | - | - | - | - | - | - | - | - |
| DIOXINFURAN | 1,2,3,4,7,8-HxCDD | SO | N | 13 | mg/kg | <2.1E-08 | 0.00000234 | 0.00 | n.d. | 0.00 | n.d. | 0.00 | 5 | 38 | - | - | - | - | - | - | - | - | - |
| DIOXINFURAN | 1,2,3,4,7,8-HxCDF | SO | N | 13 | mg/kg | <2.8E-08 | 0.00000963 | 0.00 | 0.00 | 0.00 | n.d. | 0.00 | 11 | 85 | - | - | - | - | - | - | - | - | - |
| DIOXINFURAN | 1,2,3,6,7,8-HxCDD | SO | N | 13 | mg/kg | <2E-08 | 0.0000108 | 0.00 | 0.00 | 0.00 | n.d. | 0.00 | 10 | 77 | - | - | - | - | - | - | - | - | - |
| DIOXINFURAN | 1,2,3,6,7,8-HxCDF | SO | N | 13 | mg/kg | <1.7E-08 | 0.00000286 | 0.00 | n.d. | 0.00 | n.d. | 0.00 | 6 | 46 | - | - | - | - | - | - | - | - | - |
| DIOXINFURAN | 1,2,3,7,8,9-HxCDD | SO | N | 13 | mg/kg | <1.9E-08 | 0.00000514 | 0.00 | 0.00 | 0.00 | n.d. | 0.00 | 11 | 85 | - | - | - | - | - | - | - | - | - |
| DIOXINFURAN | 1,2,3,7,8,9-HxCDF | SO | N | 13 | mg/kg | <1.6E-08 | 0.000000077 | 0.00 | n.d. | 0.00 | n.d. | 0.00 | 2 | 15 | - | - | - | - | - | - | - | - | - |
| DIOXINFURAN | 1,2,3,7,8-PeCDD | SO | N | 13 | mg/kg | <3.4E-08 | 0.00000022 | 0.00 | n.d. | 0.00 | n.d. | 0.00 | 3 | 23 | - | - | - | - | - | - | - | - | - |
| DIOXINFURAN | 1,2,3,7,8-PeCDF | SO | N | 13 | mg/kg | <1.5E-08 | 0.0000021 | 0.00 | n.d. | 0.00 | n.d. | 0.00 | 4 | 31 | - | - | - | - | - | - | - | - | - |
| DIOXINFURAN | 2,3,4,6,7,8-HxCDF | SO | N | 13 | mg/kg | <2.6E-08 | 0.00000458 | 0.00 | 0.00 | 0.00 | n.d. | 0.00 | 7 | 54 | - | - | - | - | - | - | - | - | - |
| DIOXINFURAN | 2,3,4,7,8-PeCDF | SO | N | 13 | mg/kg | <2.6E-08 | 0.00000188 | 0.00 | n.d. | 0.00 | n.d. | 0.00 | 4 | 31 | - | - | - | - | - | - | - | - | - |
| DIOXINFURAN | 2,3,7,8-TCDD | SO | N | 13 | mg/kg | <1.6E-08 | 0.00000011 | n.d. | n.d. | n.d. | n.d. | 0.00 | 1 | 8 | 0 | 0 | 0.000022 | 0 | 0 | 0.0000048 | 1 | 8 | 0.000000059 |
| DIOXINFURAN | 2,3,7,8-TCDF | SO | N | 13 | mg/kg | <2.8E-08 | 0.00000202 | 0.00 | 0.00 | 0.00 | n.d. | 0.00 | 10 | 77 | - | - | - | - | - | - | - | - | - |
| DIOXINFURAN | OCDD | SO | N | 13 | mg/kg | <2.4E-08 | 0.00435 | 0.00 | 0.00 | 0.00 | n.d. | 0.00 | 12 | 92 | - | - | - | - | - | - | - | - | - |
| DIOXINFURAN | OCDF | SO | N | 13 | mg/kg | <2.2E-08 | 0.0000796 | 0.00 | 0.00 | 0.00 | n.d. | 0.00 | 7 | 54 | - | - | - | - | - | - | - | - | - |
| DIOXINFURAN | Total HpCDD | SO | N | 13 | mg/kg | 0.00000046 | 0.000558 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 13 | 100 | - | - | - | - | - | - | - | - | - |
| DIOXINFURAN | Total HpCDF | SO | N | 13 | mg/kg | 0.00000025 | 0.000239 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 13 | 100 | - | - | - | - | - | - | - | - | - |
| DIOXINFURAN | Total HxCDD | SO | N | 13 | mg/kg | <2.3E-08 | 0.0000377 | 0.00 | 0.00 | 0.00 | n.d. | 0.00 | 12 | 92 | - | - | - | - | - | - | - | - | - |
| DIOXINFURAN | Total HxCDF | SO | N | 13 | mg/kg | <2.9E-08 | 0.000178 | 0.00 | 0.00 | 0.00 | n.d. | 0.00 | 11 | 85 | - | - | - | - | - | - | - | - | - |
| DIOXINFURAN | Total PeCDD | SO | N | 13 | mg/kg | <3.4E-08 | 0.00000048 | 0.00 | n.d. | 0.00 | n.d. | 0.00 | 4 | 31 | - | - | - | - | - | - | - | - | - |
| DIOXINFURAN | Total PeCDF | SO | N | 13 | mg/kg | <2.8E-08 | 0.0000227 | 0.00 | 0.00 | 0.00 | n.d. | 0.00 | 10 | 77 | - | - | - | - | - | - | - | - | - |
| DIOXINFURAN | Total TCDD | SO | N | 13 | mg/kg | <2.8E-08 | 0.00000065 | 0.00 | n.d. | 0.00 | n.d. | 0.00 | 6 | 46 | - | - | - | - | - | - | - | - | - |
| DIOXINFURAN | Total TCDF | SO | N | 13 | mg/kg | <2.8E-08 | 0.00000389 | 0.00 | 0.00 | 0.00 | n.d. | 0.00 | 11 | 85 | - | - | - | - | - | - | - | - | - |
| GENCHEM | Fluoride | SO | N | 132 | mg/kg | 0.31 | 367 | 46.47 | 24.85 | 63.40 | 1.73 | 165.45 | 132 | 100 | 0.00 | 0 | 4700 | 2 | 2 | 310 | 90 | 68 | 12 |
| GENCHEM | Total Organic Carbon (1) | SO | T | 16 | mg/kg | 1760 | 57200 | 11707.50 | 6965.00 | 13927.22 | 1797.50 | 30200.00 | 16 | 100 | - | - | - | - | - | - | - | - | - |
| METALS | Aluminum | SO | T | 132 | mg/kg | 2560 | 121000 | 13368.03 | 10600.00 | 12664.98 | 6028.50 | 22890.00 | 132 | 100 | 1.00 | 1 | 110000 | 110 | 83 | 7700 | 131 | 99 | 3000 |
| METALS | Antimony | SO | T | 132 | mg/kg | <0.26 | 0.68 | n.d. | n.d. | n.d. | n.d. | n.d. | 2 | 2 | 0 | 0 | 47 | 0 | 0 | 3.1 | 2 | 2 | 0.035 |
| METALS | Arsenic | SO | T | 132 | mg/kg | <0.7 | 22.5 | 4.71 | 4.35 | 2.63 | 1.75 | 8.15 | 131 | 99 | 112.00 | 85 | 3 | 130 | 98 | 0.68 | 131 | 99 | 0.0015 |
| METALS | Barium | SO | T | 132 | mg/kg | 32.6 | 555 | 123.32 | 94.70 | 85.67 | 47.72 | 294.30 | 132 | 100 | 0.00 | 0 | 22000 | 0 | 0 | 1500 | 132 | 100 | 16 |
| METALS | Beryllium | SO | T | 132 | mg/kg | 0.11 | 10.6 | 0.61 | 0.44 | 1.11 | 0.24 | 0.92 | 132 | 100 | 0.00 | 0 | 230 | 0 | 0 | 16 | 2 | 2 | 1.9 |
| METALS | Cadmium | SO | T | 132 | mg/kg | <0.24 | 5.9 | n.d. | n.d. | n.d. | n.d. | 4.67 | 15 | 11 | 0 | 0 | 98 | 0 | 0 | 7.1 | 15 | 11 | 0.069 |
| METALS | Calcium | SO | T | 132 | mg/kg | 1470 | 201000 | 22263.86 | 16300.00 | 24902.03 | 1984.00 | 65680.00 | 132 | 100 | - | - | - | - | - | - | - | - | - |
| METALS | Chromium | SO | T | 132 | mg/kg | 2.9 | 34.7 | 10.83 | 9.80 | 4.61 | 6.46 | 20.41 | 132 | 100 | - | - | - | - | - | - | - | - | - |
| METALS | Cobalt | SO | T | 132 | mg/kg | 1.5 | 11.7 | 5.22 | 5.10 | 1.37 | 3.41 | 7.29 | 132 | 100 | 0.00 | 0 | 35 | 130 | 98 | 2.3 | 132 | 100 | 0.027 |
| METALS | Copper | SO | T | 132 | mg/kg | 3.3 | 118 | 16.45 | 13.65 | 12.26 | 8.16 | 34.95 | 132 | 100 | 0.00 | 0 | 4700 | 0 | 0 | 310 | 132 | 100 | 2.8 |
| METALS | Cyanide, Total | SO | T | 132 | mg/kg | <0.015 | 125 | 1.39 | 0.05 | 11.32 | n.d. | 0.97 | 114 | 86 | 2 | 2 | 15 | 3 | 2 | 2.3 | 114 | 86 | 0.0015 |

**Table 9. Site-wide Shallow Soil Analytical Results Statistical Summary**
**Columbia Falls Aluminum Company, LLC, Phase I Site Characterization, 2000 Aluminum Drive, Columbia Falls, MT**

| | | | | | | | | | | | | | | | Industrial RSL | | | Residential RSL | | | Risk SSL | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Group | Analyte | Matrix | Fraction | No. of Results | Unit | Min | Max | Mean | Median | Standard Deviation | 5th Percentile | 95th Percentile | # > LOD | % > LOD | No. Exceeding | % Exceeding | Action Level | No. Exceeding | % Exceeding | Action Level | No. Exceeding | % Exceeding | Action Level |
| METALS | Iron | SO | T | 132 | mg/kg | 1580 | 25000 | 13422.05 | 13550.00 | 3547.13 | 7951.00 | 18815.00 | 132 | 100 | 0.00 | 0 | 82000 | 129 | 98 | 5500 | 132 | 100 | 35 |
| METALS | Lead | SO | T | 132 | mg/kg | 2.1 | 130 | 12.89 | 9.60 | 14.94 | 5.32 | 26.75 | 132 | 100 | 0.00 | 0 | 800 | 0 | 0 | 400 | - | - | - |
| METALS | Magnesium | SO | T | 132 | mg/kg | 2950 | 21800 | 9645.38 | 9210.00 | 2993.92 | 5634.00 | 14390.00 | 132 | 100 | - | - | - | - | - | - | - | - | - |
| METALS | Manganese | SO | T | 132 | mg/kg | 10.7 | 920 | 370.64 | 379.00 | 164.14 | 70.64 | 641.70 | 132 | 100 | 0.00 | 0 | 2600 | 115 | 87 | 180 | 132 | 100 | 2.8 |
| METALS | Mercury | SO | T | 132 | mg/kg | <0.011 | 0.27 | 0.02 | 0.02 | 0.03 | n.d. | 0.04 | 103 | 78 | 0 | 0 | 4.6 | 0 | 0 | 1.1 | 103 | 78 | 0.0033 |
| METALS | Nickel | SO | T | 132 | mg/kg | 4.3 | 358 | 20.67 | 11.50 | 39.32 | 7.57 | 71.95 | 132 | 100 | 0.00 | 0 | 2200 | 3 | 2 | 150 | 132 | 100 | 2.6 |
| METALS | Potassium | SO | T | 132 | mg/kg | 194 | 1570 | 803.91 | 788.50 | 253.18 | 440.55 | 1233.50 | 132 | 100 | - | - | - | - | - | - | - | - | - |
| METALS | Selenium | SO | T | 132 | mg/kg | <0.25 | 1.9 | n.d. | n.d. | n.d. | n.d. | 1.34 | 19 | 14 | 0 | 0 | 580 | 0 | 0 | 39 | 19 | 14 | 0.052 |
| METALS | Silver | SO | T | 132 | mg/kg | <0.52 | 0.99 | n.d. | n.d. | n.d. | n.d. | n.d. | 2 | 2 | 0 | 0 | 580 | 0 | 0 | 39 | 2 | 2 | 0.08 |
| METALS | Sodium | SO | T | 132 | mg/kg | <29.2 | 978 | 94.69 | 46.00 | 166.22 | n.d. | 597.75 | 88 | 67 | - | - | - | - | - | - | - | - | - |
| METALS | Thallium | SO | T | 132 | mg/kg | <0.1 | 3 | n.d. | n.d. | n.d. | n.d. | 2.92 | 13 | 10 | 2 | 2 | 1.2 | 13 | 10 | 0.078 | 13 | 10 | 0.0014 |
| METALS | Vanadium | SO | T | 132 | mg/kg | 2.6 | 109 | 13.18 | 10.55 | 13.02 | 5.51 | 26.48 | 132 | 100 | 0.00 | 0 | 580 | 4 | 3 | 39 | 93 | 70 | 8.6 |
| METALS | Zinc | SO | T | 132 | mg/kg | 12.6 | 281 | 53.39 | 41.35 | 39.19 | 27.46 | 133.40 | 132 | 100 | 0.00 | 0 | 35000 | 0 | 0 | 2300 | 89 | 67 | 37 |
| PCB | Aroclor 1016 | SO | N | 132 | mg/kg | <0.0092 | <0.021 | n.d. | n.d. | n.d. | n.d. | n.d. | 0 | 0 | 0 | 0 | 5.1 | 0 | 0 | 0.41 | 0 | 0 | 0.013 |
| PCB | Aroclor 1221 | SO | N | 132 | mg/kg | <0.0092 | <0.021 | n.d. | n.d. | n.d. | n.d. | n.d. | 0 | 0 | 0.00 | 0 | 0.83 | 0 | 0 | 0.2 | 0 | 0 | 0.00008 |
| PCB | Aroclor 1232 | SO | N | 132 | mg/kg | <0.0092 | <0.021 | n.d. | n.d. | n.d. | n.d. | n.d. | 0 | 0 | 0 | 0 | 0.72 | 0 | 0 | 0.17 | 0 | 0 | 0.00008 |
| PCB | Aroclor 1242 | SO | N | 132 | mg/kg | <0.0092 | <0.021 | n.d. | n.d. | n.d. | n.d. | n.d. | 0 | 0 | 0 | 0 | 0.95 | 0 | 0 | 0.23 | 0 | 0 | 0.0012 |
| PCB | Aroclor 1248 | SO | N | 132 | mg/kg | <0.0092 | <0.021 | n.d. | n.d. | n.d. | n.d. | n.d. | 0 | 0 | 0 | 0 | 0.95 | 0 | 0 | 0.23 | 0 | 0 | 0.0012 |
| PCB | Aroclor 1254 | SO | N | 132 | mg/kg | <0.0095 | <0.022 | n.d. | n.d. | n.d. | n.d. | n.d. | 0 | 0 | 0 | 0 | 0.97 | 0 | 0 | 0.12 | 0 | 0 | 0.002 |
| PCB | Aroclor 1260 | SO | N | 132 | mg/kg | <0.0095 | <0.022 | n.d. | n.d. | n.d. | n.d. | n.d. | 0 | 0 | 0 | 0 | 0.99 | 0 | 0 | 0.24 | 0 | 0 | 0.0055 |
| PCB | Aroclor 1268 | SO | N | 132 | mg/kg | <0.0095 | <0.022 | n.d. | n.d. | n.d. | n.d. | n.d. | 0 | 0 | - | - | - | - | - | - | - | - | - |
| PCB | Aroclor-1262 | SO | N | 132 | mg/kg | <0.0095 | <0.022 | n.d. | n.d. | n.d. | n.d. | n.d. | 0 | 0 | - | - | - | - | - | - | - | - | - |
| PCB | Polychlorinated biphenyls, Total | SO | N | 132 | mg/kg | <0.0095 | <0.022 | n.d. | n.d. | n.d. | n.d. | n.d. | 0 | 0 | 0 | 0 | 0.94 | 0 | 0 | 0.23 | 0 | 0 | 0.0068 |
| SVOC | 1,1'-Biphenyl | SO | N | 132 | mg/kg | <0.029 | 0.11 | n.d. | n.d. | n.d. | n.d. | n.d. | 3 | 2 | 0 | 0 | 20 | 0 | 0 | 4.7 | 3 | 2 | 0.00087 |
| SVOC | 1,2,4,5-Tetrachlorobenzene | SO | N | 132 | mg/kg | <0.025 | <5.3 | n.d. | n.d. | n.d. | n.d. | n.d. | 0 | 0 | 0 | 0 | 35 | 0 | 0 | 2.3 | 0 | 0 | 0.00079 |
| SVOC | 1,4-Dioxane | SO | N | 132 | mg/kg | <0.092 | <19 | n.d. | n.d. | n.d. | n.d. | n.d. | 0 | 0 | 0 | 0 | 24 | 0 | 0 | 5.3 | 0 | 0 | 0.000094 |
| SVOC | 2,2'-oxybis[1-chloropropane] | SO | N | 132 | mg/kg | <0.014 | <2.9 | n.d. | n.d. | n.d. | n.d. | n.d. | 0 | 0 | 0 | 0 | 4700 | 0 | 0 | 310 | 0 | 0 | 0.026 |
| SVOC | 2,3,4,6-Tetrachlorophenol | SO | N | 131 | mg/kg | <0.032 | <6.7 | n.d. | n.d. | n.d. | n.d. | n.d. | 0 | 0 | 0 | 0 | 2500 | 0 | 0 | 190 | 0 | 0 | 0.018 |
| SVOC | 2,4,5-Trichlorophenol | SO | N | 131 | mg/kg | <0.034 | <7.1 | n.d. | n.d. | n.d. | n.d. | n.d. | 0 | 0 | 0 | 0 | 8200 | 0 | 0 | 630 | 0 | 0 | 0.4 |
| SVOC | 2,4,6-Trichlorophenol | SO | N | 131 | mg/kg | <0.0097 | <2 | n.d. | n.d. | n.d. | n.d. | n.d. | 0 | 0 | 0 | 0 | 82 | 0 | 0 | 6.3 | 0 | 0 | 0.0012 |
| SVOC | 2,4-Dichlorophenol | SO | N | 131 | mg/kg | <0.0081 | <1.7 | n.d. | n.d. | n.d. | n.d. | n.d. | 0 | 0 | 0 | 0 | 250 | 0 | 0 | 19 | 0 | 0 | 0.0023 |
| SVOC | 2,4-Dimethylphenol | SO | N | 131 | mg/kg | <0.075 | <16 | n.d. | n.d. | n.d. | n.d. | n.d. | 0 | 0 | 0 | 0 | 1600 | 0 | 0 | 130 | 0 | 0 | 0.042 |
| SVOC | 2,4-Dinitrophenol | SO | N | 131 | mg/kg | <0.26 | <54 | n.d. | n.d. | n.d. | n.d. | n.d. | 0 | 0 | 0 | 0 | 160 | 0 | 0 | 13 | 0 | 0 | 0.0044 |
| SVOC | 2,4-Dinitrotoluene | SO | N | 132 | mg/kg | <0.014 | <2.8 | n.d. | n.d. | n.d. | n.d. | n.d. | 0 | 0 | 0 | 0 | 7.4 | 0 | 0 | 1.7 | 0 | 0 | 0.00032 |
| SVOC | 2,6-Dinitrotoluene | SO | N | 132 | mg/kg | <0.018 | <3.8 | n.d. | n.d. | n.d. | n.d. | n.d. | 0 | 0 | 0.00 | 0 | 1.5 | 0 | 0 | 0.36 | 0 | 0 | 0.000067 |
| SVOC | 2-Chloronaphthalene | SO | N | 132 | mg/kg | <0.0078 | <1.6 | n.d. | n.d. | n.d. | n.d. | n.d. | 0 | 0 | 0 | 0 | 6000 | 0 | 0 | 480 | 0 | 0 | 0.39 |
| SVOC | 2-Chlorophenol | SO | N | 131 | mg/kg | <0.0087 | <1.8 | n.d. | n.d. | n.d. | n.d. | n.d. | 0 | 0 | 0 | 0 | 580 | 0 | 0 | 39 | 0 | 0 | 0.0089 |
| SVOC | 2-Methylnaphthalene | SO | N | 132 | mg/kg | <0.0076 | 4.2 | 0.09 | n.d. | 0.50 | n.d. | 1.83 | 34 | 26 | 0 | 0 | 300 | 0 | 0 | 24 | 22 | 17 | 0.019 |

**Table 9. Site-wide Shallow Soil Analytical Results Statistical Summary**
**Columbia Falls Aluminum Company, LLC, Phase I Site Characterization, 2000 Aluminum Drive, Columbia Falls, MT**

| Group | Analyte | Matrix | Fraction | No. of Results | Unit | Min | Max | Mean | Median | Standard Deviation | 5th Percentile | 95th Percentile | # > LOD | % > LOD | Industrial RSL | | | Residential RSL | | | Risk SSL | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | | | | | | | | No. Exceeding | % Exceeding | Action Level | No. Exceeding | % Exceeding | Action Level | No. Exceeding | % Exceeding | Action Level |
| SVOC | 2-Methylphenol | SO | N | 131 | mg/kg | <0.015 | <3.1 | n.d. | n.d. | n.d. | n.d. | n.d. | 0 | 0 | 0 | 0 | 4100 | 0 | 0 | 320 | 0 | 0 | 0.075 |
| SVOC | 2-Nitroaniline | SO | N | 132 | mg/kg | <0.011 | <2.3 | n.d. | n.d. | n.d. | n.d. | n.d. | 0 | 0 | 0 | 0 | 800 | 0 | 0 | 63 | 0 | 0 | 0.008 |
| SVOC | 2-Nitrophenol | SO | N | 131 | mg/kg | <0.011 | <2.4 | n.d. | n.d. | n.d. | n.d. | n.d. | 0 | 0 | - | - | - | - | - | - | - | - | - |
| SVOC | 3 & 4 Methylphenol | SO | N | 131 | mg/kg | <0.0091 | 1 | n.d. | n.d. | n.d. | n.d. | n.d. | 5 | 4 | - | - | - | - | - | - | - | - | - |
| SVOC | 3,3'-Dichlorobenzidine | SO | N | 132 | mg/kg | <0.038 | <7.9 | n.d. | n.d. | n.d. | n.d. | n.d. | 0 | 0 | 0 | 0 | 5.1 | 0 | 0 | 1.2 | 0 | 0 | 0.00082 |
| SVOC | 3-Nitroaniline | SO | N | 132 | mg/kg | <0.01 | <2.1 | n.d. | n.d. | n.d. | n.d. | n.d. | 0 | 0 | - | - | - | - | - | - | - | - | - |
| SVOC | 4,6-Dinitro-2-methylphenol | SO | N | 131 | mg/kg | <0.091 | <19 | n.d. | n.d. | n.d. | n.d. | n.d. | 0 | 0 | 0 | 0 | 6.6 | 0 | 0 | 0.51 | 0 | 0 | 0.00026 |
| SVOC | 4-Bromophenyl phenyl ether | SO | N | 132 | mg/kg | <0.011 | <2.2 | n.d. | n.d. | n.d. | n.d. | n.d. | 0 | 0 | - | - | - | - | - | - | - | - | - |
| SVOC | 4-Chloro-3-methylphenol | SO | N | 131 | mg/kg | <0.015 | <3 | n.d. | n.d. | n.d. | n.d. | n.d. | 0 | 0 | 0 | 0 | 8200 | 0 | 0 | 630 | 0 | 0 | 0.17 |
| SVOC | 4-Chloroaniline | SO | N | 132 | mg/kg | <0.0088 | 0.019 | n.d. | n.d. | n.d. | n.d. | n.d. | 1 | 1 | 0 | 0 | 11 | 0 | 0 | 2.7 | 1 | 1 | 0.00016 |
| SVOC | 4-Chlorophenyl phenyl ether | SO | N | 132 | mg/kg | <0.01 | <2.1 | n.d. | n.d. | n.d. | n.d. | n.d. | 0 | 0 | - | - | - | - | - | - | - | - | - |
| SVOC | 4-Nitroaniline | SO | N | 132 | mg/kg | <0.013 | <2.7 | n.d. | n.d. | n.d. | n.d. | n.d. | 0 | 0 | 0 | 0 | 110 | 0 | 0 | 25 | 0 | 0 | 0.0016 |
| SVOC | 4-Nitrophenol | SO | N | 131 | mg/kg | <0.16 | <34 | n.d. | n.d. | n.d. | n.d. | n.d. | 0 | 0 | - | - | - | - | - | - | - | - | - |
| SVOC | Acenaphthene | SO | N | 132 | mg/kg | <0.0083 | 28 | 0.57 | n.d. | 2.94 | n.d. | 5.84 | 57 | 43 | 0.00 | 0 | 4500 | 0 | 0 | 360 | 11 | 8 | 0.55 |
| SVOC | Acenaphthylene | SO | N | 132 | mg/kg | <0.0088 | 1 | n.d. | n.d. | n.d. | n.d. | n.d. | 4 | 3 | - | - | - | - | - | - | - | - | - |
| SVOC | Acetophenone | SO | N | 132 | mg/kg | <0.0075 | 0.017 | n.d. | n.d. | n.d. | n.d. | n.d. | 2 | 2 | 0 | 0 | 12000 | 0 | 0 | 780 | 0 | 0 | 0.058 |
| SVOC | Anthracene | SO | N | 132 | mg/kg | <0.033 | 110 | 1.74 | n.d. | 10.63 | n.d. | 22.31 | 44 | 33 | 0 | 0 | 23000 | 0 | 0 | 1800 | 6 | 5 | 5.8 |
| SVOC | Atrazine | SO | N | 132 | mg/kg | <0.015 | <3.2 | n.d. | n.d. | n.d. | n.d. | n.d. | 0 | 0 | 0 | 0 | 10 | 0 | 0 | 2.4 | 0 | 0 | 0.0002 |
| SVOC | Benzaldehyde | SO | N | 132 | mg/kg | <0.026 | <5.4 | n.d. | n.d. | n.d. | n.d. | n.d. | 0 | 0 | 0 | 0 | 820 | 0 | 0 | 170 | 0 | 0 | 0.0041 |
| SVOC | Benzo[a]anthracene | SO | N | 132 | mg/kg | <0.029 | 260 | 5.49 | 0.06 | 26.26 | n.d. | 44.80 | 86 | 65 | 13 | 10 | 2.9 | 52 | 39 | 0.16 | 86 | 65 | 0.0042 |
| SVOC | Benzo[a]pyrene | SO | N | 132 | mg/kg | <0.011 | 170 | 5.16 | 0.07 | 21.00 | n.d. | 38.50 | 103 | 78 | 41 | 31 | 0.29 | 95 | 72 | 0.016 | 103 | 78 | 0.004 |
| SVOC | Benzo[b]fluoranthene | SO | N | 132 | mg/kg | <0.014 | 330 | 8.49 | 0.14 | 37.67 | n.d. | 61.30 | 108 | 82 | 22 | 17 | 2.9 | 61 | 46 | 0.16 | 89 | 67 | 0.041 |
| SVOC | Benzo[g,h,i]perylene | SO | N | 132 | mg/kg | <0.02 | 140 | 4.30 | 0.09 | 16.76 | n.d. | 40.00 | 92 | 70 | - | - | - | - | - | - | - | - | - |
| SVOC | Benzo[k]fluoranthene | SO | N | 132 | mg/kg | <0.015 | 110 | 2.93 | 0.05 | 12.42 | n.d. | 26.00 | 86 | 65 | 4 | 3 | 29 | 16 | 12 | 1.6 | 29 | 22 | 0.4 |
| SVOC | Bis(2-chloroethoxy)methane | SO | N | 132 | mg/kg | <0.011 | <2.2 | n.d. | n.d. | n.d. | n.d. | n.d. | 0 | 0 | 0 | 0 | 250 | 0 | 0 | 19 | 0 | 0 | 0.0013 |
| SVOC | Bis(2-chloroethyl)ether | SO | N | 132 | mg/kg | <0.0081 | <1.7 | n.d. | n.d. | n.d. | n.d. | n.d. | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0.23 | 0 | 0 | 0.0000036 |
| SVOC | Bis(2-ethylhexyl) phthalate | SO | N | 132 | mg/kg | <0.013 | 5.9 | 0.06 | n.d. | 0.52 | n.d. | 0.48 | 25 | 19 | 0 | 0 | 160 | 0 | 0 | 39 | 1 | 1 | 1.3 |
| SVOC | Butyl benzyl phthalate | SO | N | 132 | mg/kg | <0.011 | 1.9 | n.d. | n.d. | n.d. | n.d. | 0.89 | 15 | 11 | 0 | 0 | 1200 | 0 | 0 | 290 | 2 | 2 | 0.24 |
| SVOC | Caprolactam | SO | N | 132 | mg/kg | <0.025 | 0.046 | n.d. | n.d. | n.d. | n.d. | n.d. | 3 | 2 | 0 | 0 | 40000 | 0 | 0 | 3100 | 0 | 0 | 0.25 |
| SVOC | Carbazole | SO | N | 132 | mg/kg | <0.0085 | 24 | 0.61 | 0.01 | 2.58 | n.d. | 6.68 | 67 | 51 | - | - | - | - | - | - | - | - | - |
| SVOC | Chrysene | SO | N | 132 | mg/kg | <0.0095 | 500 | 8.96 | 0.09 | 48.40 | n.d. | 53.30 | 110 | 83 | 1 | 1 | 290 | 9 | 7 | 16 | 26 | 20 | 1.2 |
| SVOC | Dibenz(a,h)anthracene | SO | N | 132 | mg/kg | <0.018 | 42 | 1.19 | n.d. | 4.87 | n.d. | 13.80 | 63 | 48 | 27 | 20 | 0.29 | 63 | 48 | 0.016 | 63 | 48 | 0.013 |
| SVOC | Dibenzofuran | SO | N | 132 | mg/kg | <0.01 | 15 | 0.29 | n.d. | 1.59 | n.d. | 6.70 | 35 | 27 | 0 | 0 | 100 | 2 | 2 | 7.3 | 31 | 23 | 0.015 |
| SVOC | Diethyl phthalate | SO | N | 132 | mg/kg | <0.0097 | 2.3 | n.d. | n.d. | n.d. | n.d. | n.d. | 2 | 2 | 0 | 0 | 66000 | 0 | 0 | 5100 | 1 | 1 | 0.61 |
| SVOC | Dimethyl phthalate | SO | N | 132 | mg/kg | <0.0099 | <2.1 | n.d. | n.d. | n.d. | n.d. | n.d. | 0 | 0 | - | - | - | - | - | - | - | - | - |
| SVOC | Di-n-butyl phthalate | SO | N | 132 | mg/kg | <0.01 | 0.48 | 0.01 | n.d. | 0.05 | n.d. | 0.20 | 20 | 15 | 0 | 0 | 8200 | 0 | 0 | 630 | 1 | 1 | 0.23 |
| SVOC | Di-n-octyl phthalate | SO | N | 132 | mg/kg | <0.017 | 0.61 | n.d. | n.d. | n.d. | n.d. | n.d. | 1 | 1 | 0 | 0 | 820 | 0 | 0 | 63 | 0 | 0 | 5.7 |
| SVOC | Fluoranthene | SO | N | 132 | mg/kg | <0.01 | 1400 | 18.48 | 0.09 | 126.41 | n.d. | 74.30 | 108 | 82 | 0.00 | 0 | 3000 | 2 | 2 | 240 | 13 | 10 | 8.9 |

**Table 9. Site-wide Shallow Soil Analytical Results Statistical Summary**
**Columbia Falls Aluminum Company, LLC, Phase I Site Characterization, 2000 Aluminum Drive, Columbia Falls, MT**

| | | | | | | | | | | | | | | | Industrial RSL | | | Residential RSL | | | Risk SSL | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Group | Analyte | Matrix | Fraction | No. of Results | Unit | Min | Max | Mean | Median | Standard Deviation | 5th Percentile | 95th Percentile | # > LOD | % > LOD | No. Exceeding | % Exceeding | Action Level | No. Exceeding | % Exceeding | Action Level | No. Exceeding | % Exceeding | Action Level |
| SVOC | Fluorene | SO | N | 132 | mg/kg | <0.0075 | 25 | 0.56 | n.d. | 3.07 | n.d. | 8.13 | 50 | 38 | 0 | 0 | 3000 | 0 | 0 | 240 | 9 | 7 | 0.54 |
| SVOC | Hexachlorobenzene | SO | N | 132 | mg/kg | <0.014 | 0.091 | n.d. | n.d. | n.d. | n.d. | n.d. | 1 | 1 | 0 | 0 | 0.96 | 0 | 0 | 0.21 | 1 | 1 | 0.00012 |
| SVOC | Hexachlorobutadiene | SO | N | 132 | mg/kg | <0.0096 | <2 | n.d. | n.d. | n.d. | n.d. | n.d. | 0 | 0 | 0 | 0 | 5.3 | 0 | 0 | 1.2 | 0 | 0 | 0.00027 |
| SVOC | Hexachlorocyclopentadiene | SO | N | 132 | mg/kg | <0.021 | <4.4 | n.d. | n.d. | n.d. | n.d. | n.d. | 0 | 0 | 0 | 0 | 0.75 | 0 | 0 | 0.18 | 0 | 0 | 0.00013 |
| SVOC | Hexachloroethane | SO | N | 132 | mg/kg | <0.013 | <2.6 | n.d. | n.d. | n.d. | n.d. | n.d. | 0 | 0 | 0 | 0 | 8 | 0 | 0 | 1.8 | 0 | 0 | 0.0002 |
| SVOC | Indeno[1,2,3-cd]pyrene | SO | N | 132 | mg/kg | <0.023 | 140 | 4.53 | 0.09 | 17.28 | n.d. | 46.80 | 89 | 67 | 17 | 13 | 2.9 | 55 | 42 | 0.16 | 60 | 45 | 0.13 |
| SVOC | Isophorone | SO | N | 132 | mg/kg | <0.0073 | 3.3 | n.d. | n.d. | n.d. | n.d. | 3.14 | 12 | 9 | 0 | 0 | 2400 | 0 | 0 | 570 | 6 | 5 | 0.026 |
| SVOC | Naphthalene | SO | N | 132 | mg/kg | <0.0087 | 10 | 0.19 | n.d. | 0.97 | n.d. | 2.62 | 38 | 29 | 0.00 | 0 | 17 | 1 | 1 | 3.8 | 38 | 29 | 0.00054 |
| SVOC | Nitrobenzene | SO | N | 132 | mg/kg | <0.011 | <2.2 | n.d. | n.d. | n.d. | n.d. | n.d. | 0 | 0 | 0 | 0 | 22 | 0 | 0 | 5.1 | 0 | 0 | 0.000092 |
| SVOC | N-Nitrosodi-n-propylamine | SO | N | 132 | mg/kg | <0.011 | <2.4 | n.d. | n.d. | n.d. | n.d. | n.d. | 0 | 0 | 0 | 0 | 0.33 | 0 | 0 | 0.078 | 0 | 0 | 0.0000081 |
| SVOC | N-Nitrosodiphenylamine | SO | N | 132 | mg/kg | <0.031 | <6.4 | n.d. | n.d. | n.d. | n.d. | n.d. | 0 | 0 | 0 | 0 | 470 | 0 | 0 | 110 | 0 | 0 | 0.067 |
| SVOC | Pentachlorophenol | SO | N | 131 | mg/kg | <0.041 | 0.28 | n.d. | n.d. | n.d. | n.d. | n.d. | 2 | 2 | 0 | 0 | 4 | 0 | 0 | 1 | 2 | 2 | 0.000057 |
| SVOC | Phenanthrene | SO | N | 132 | mg/kg | <0.0093 | 440 | 7.39 | 0.06 | 44.04 | n.d. | 27.00 | 105 | 80 | - | - | - | - | - | - | - | - | - |
| SVOC | Phenol | SO | N | 131 | mg/kg | <0.011 | 1.2 | n.d. | n.d. | n.d. | n.d. | n.d. | 3 | 2 | 0.00 | 0 | 25000 | 0 | 0 | 1900 | 1 | 1 | 0.33 |
| SVOC | Pyrene | SO | N | 132 | mg/kg | <0.016 | 1200 | 14.88 | 0.11 | 106.33 | n.d. | 70.70 | 104 | 79 | 0 | 0 | 2300 | 1 | 1 | 180 | 25 | 19 | 1.3 |
| VOC | 1,1,1-Trichloroethane | SO | N | 132 | mg/kg | <0.00023 | <0.001 | n.d. | n.d. | n.d. | n.d. | n.d. | 0 | 0 | 0 | 0 | 3600 | 0 | 0 | 810 | 0 | 0 | 0.28 |
| VOC | 1,1,2,2-Tetrachloroethane | SO | N | 132 | mg/kg | <0.0001 | <0.00046 | n.d. | n.d. | n.d. | n.d. | n.d. | 0 | 0 | 0 | 0 | 2.7 | 0 | 0 | 0.6 | 0 | 0 | 0.00003 |
| VOC | 1,1,2-Trichloro-1,2,2-trifluoroethane | SO | N | 132 | mg/kg | <0.00026 | <0.0012 | n.d. | n.d. | n.d. | n.d. | n.d. | 0 | 0 | 0 | 0 | 17000 | 0 | 0 | 4000 | 0 | 0 | 14 |
| VOC | 1,1,2-Trichloroethane | SO | N | 132 | mg/kg | <0.00017 | <0.00076 | n.d. | n.d. | n.d. | n.d. | n.d. | 0 | 0 | 0 | 0 | 0.63 | 0 | 0 | 0.15 | 0 | 0 | 0.000013 |
| VOC | 1,1-Dichloroethane | SO | N | 132 | mg/kg | <0.0002 | <0.00092 | n.d. | n.d. | n.d. | n.d. | n.d. | 0 | 0 | 0 | 0 | 16 | 0 | 0 | 3.6 | 0 | 0 | 0.00078 |
| VOC | 1,1-Dichloroethene | SO | N | 132 | mg/kg | <0.00025 | <0.0011 | n.d. | n.d. | n.d. | n.d. | n.d. | 0 | 0 | 0.00 | 0 | 100 | 0 | 0 | 23 | 0 | 0 | 0.01 |
| VOC | 1,2,3-Trichlorobenzene | SO | N | 132 | mg/kg | <6.6E-05 | <0.0003 | n.d. | n.d. | n.d. | n.d. | n.d. | 0 | 0 | 0.00 | 0 | 93 | 0 | 0 | 6.3 | 0 | 0 | 0.0021 |
| VOC | 1,2,4-Trichlorobenzene | SO | N | 132 | mg/kg | <0.00019 | <0.00087 | n.d. | n.d. | n.d. | n.d. | n.d. | 0 | 0 | 0.00 | 0 | 26 | 0 | 0 | 5.8 | 0 | 0 | 0.0012 |
| VOC | 1,2-Dibromo-3-Chloropropane | SO | N | 132 | mg/kg | <0.00028 | <0.0013 | n.d. | n.d. | n.d. | n.d. | n.d. | 0 | 0 | 0 | 0 | 0.064 | 0 | 0 | 0.0053 | 0 | 0 | 0.00000014 |
| VOC | 1,2-Dichlorobenzene | SO | N | 132 | mg/kg | <8.4E-05 | <0.00038 | n.d. | n.d. | n.d. | n.d. | n.d. | 0 | 0 | 0 | 0 | 930 | 0 | 0 | 180 | 0 | 0 | 0.03 |
| VOC | 1,2-Dichloroethane | SO | N | 132 | mg/kg | <6.6E-05 | 0.00014 | n.d. | n.d. | n.d. | n.d. | n.d. | 1 | 1 | 0 | 0 | 2 | 0 | 0 | 0.46 | 1 | 1 | 0.000048 |
| VOC | 1,2-Dichloropropane | SO | N | 132 | mg/kg | <0.0001 | <0.00046 | n.d. | n.d. | n.d. | n.d. | n.d. | 0 | 0 | 0 | 0 | 4.4 | 0 | 0 | 1 | 0 | 0 | 0.00015 |
| VOC | 1,3-Dichlorobenzene | SO | N | 132 | mg/kg | <7.2E-05 | <0.00032 | n.d. | n.d. | n.d. | n.d. | n.d. | 0 | 0 | - | - | - | - | - | - | - | - | - |
| VOC | 1,4-Dichlorobenzene | SO | N | 132 | mg/kg | <9.3E-05 | 0.00021 | n.d. | n.d. | n.d. | n.d. | n.d. | 1 | 1 | 0.00 | 0 | 11 | 0 | 0 | 2.6 | 0 | 0 | 0.00046 |
| VOC | 2-Butanone (MEK) | SO | N | 132 | mg/kg | <0.00055 | 0.041 | 0.00 | n.d. | 0.01 | n.d. | 0.03 | 53 | 40 | 0 | 0 | 19000 | 0 | 0 | 2700 | 0 | 0 | 0.12 |
| VOC | 2-Hexanone | SO | N | 132 | mg/kg | <0.00056 | 0.0036 | n.d. | n.d. | n.d. | n.d. | n.d. | 3 | 2 | 0 | 0 | 130 | 0 | 0 | 20 | 3 | 2 | 0.00088 |
| VOC | 4-Methyl-2-pentanone (MIBK) | SO | N | 132 | mg/kg | <0.0013 | 0.0043 | n.d. | n.d. | n.d. | n.d. | n.d. | 1 | 1 | 0 | 0 | 14000 | 0 | 0 | 3300 | 0 | 0 | 0.14 |
| VOC | Acetone | SO | N | 132 | mg/kg | <0.001 | 0.31 | 0.04 | 0.03 | 0.05 | 0.01 | 0.14 | 128 | 97 | 0 | 0 | 67000 | 0 | 0 | 6100 | 1 | 1 | 0.29 |
| VOC | Benzene | SO | N | 132 | mg/kg | <0.00015 | 0.0097 | 0.00 | 0.00 | 0.00 | n.d. | 0.00 | 83 | 63 | 0 | 0 | 5.1 | 0 | 0 | 1.2 | 76 | 58 | 0.00023 |
| VOC | Bromoform | SO | N | 132 | mg/kg | <7.8E-05 | <0.00035 | n.d. | n.d. | n.d. | n.d. | n.d. | 0 | 0 | 0 | 0 | 86 | 0 | 0 | 19 | 0 | 0 | 0.00087 |
| VOC | Bromomethane | SO | N | 132 | mg/kg | <0.00019 | 0.0011 | n.d. | n.d. | n.d. | n.d. | n.d. | 2 | 2 | 0 | 0 | 3 | 0 | 0 | 0.68 | 2 | 2 | 0.00019 |
| VOC | Carbon disulfide | SO | N | 132 | mg/kg | <0.00031 | 0.0077 | 0.00 | 0.00 | 0.00 | n.d. | 0.00 | 67 | 51 | 0.00 | 0 | 350 | 0 | 0 | 77 | 0 | 0 | 0.024 |
| VOC | Carbon tetrachloride | SO | N | 132 | mg/kg | <0.00026 | <0.0012 | n.d. | n.d. | n.d. | n.d. | n.d. | 0 | 0 | 0 | 0 | 2.9 | 0 | 0 | 0.65 | 0 | 0 | 0.00018 |

**Table 9. Site-wide Shallow Soil Analytical Results Statistical Summary**
**Columbia Falls Aluminum Company, LLC, Phase I Site Characterization, 2000 Aluminum Drive, Columbia Falls, MT**

| | | | | | | | | | | | | | | | Industrial RSL | | | Residential RSL | | | Risk SSL | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Group | Analyte | Matrix | Fraction | No. of Results | Unit | Min | Max | Mean | Median | Standard Deviation | 5th Percentile | 95th Percentile | # > LOD | % > LOD | No. Exceeding | % Exceeding | Action Level | No. Exceeding | % Exceeding | Action Level | No. Exceeding | % Exceeding | Action Level |
| VOC | Chlorobenzene | SO | N | 132 | mg/kg | <8.4E-05 | <0.00038 | n.d. | n.d. | n.d. | n.d. | n.d. | 0 | 0 | 0 | 0 | 130 | 0 | 0 | 28 | 0 | 0 | 0.0053 |
| VOC | Chlorobromomethane | SO | N | 132 | mg/kg | <0.0001 | <0.00046 | n.d. | n.d. | n.d. | n.d. | n.d. | 0 | 0 | 0 | 0 | 63 | 0 | 0 | 15 | 0 | 0 | 0.0021 |
| VOC | Chlorodibromomethane | SO | N | 132 | mg/kg | <9E-05 | <0.00041 | n.d. | n.d. | n.d. | n.d. | n.d. | 0 | 0 | 0 | 0 | 39 | 0 | 0 | 8.3 | 0 | 0 | 0.00023 |
| VOC | Chloroethane | SO | N | 132 | mg/kg | <0.00021 | <0.00095 | n.d. | n.d. | n.d. | n.d. | n.d. | 0 | 0 | 0 | 0 | 5700 | 0 | 0 | 1400 | 0 | 0 | 0.59 |
| VOC | Chloroform | SO | N | 132 | mg/kg | <0.00013 | <0.00057 | n.d. | n.d. | n.d. | n.d. | n.d. | 0 | 0 | 0 | 0 | 1.4 | 0 | 0 | 0.32 | 0 | 0 | 0.000061 |
| VOC | Chloromethane | SO | N | 132 | mg/kg | <0.00023 | <0.001 | n.d. | n.d. | n.d. | n.d. | n.d. | 0 | 0 | 0 | 0 | 46 | 0 | 0 | 11 | 0 | 0 | 0.0049 |
| VOC | cis-1,2-Dichloroethene | SO | N | 132 | mg/kg | <0.00013 | <0.0006 | n.d. | n.d. | n.d. | n.d. | n.d. | 0 | 0 | 0.00 | 0 | 230 | 0 | 0 | 16 | 0 | 0 | 0.0011 |
| VOC | cis-1,3-Dichloropropene | SO | N | 132 | mg/kg | <9E-05 | <0.00041 | n.d. | n.d. | n.d. | n.d. | n.d. | 0 | 0 | - | - | - | - | - | - | - | - | - |
| VOC | Cyclohexane | SO | N | 132 | mg/kg | <0.00028 | 0.0086 | 0.00 | n.d. | 0.00 | n.d. | 0.00 | 28 | 21 | 0.00 | 0 | 2700 | 0 | 0 | 650 | 0 | 0 | 1.3 |
| VOC | Dichlorobromomethane | SO | N | 132 | mg/kg | <0.00023 | <0.001 | n.d. | n.d. | n.d. | n.d. | n.d. | 0 | 0 | 0 | 0 | 1.3 | 0 | 0 | 0.29 | 0 | 0 | 0.000036 |
| VOC | Dichlorodifluoromethane | SO | N | 132 | mg/kg | <0.00019 | <0.00087 | n.d. | n.d. | n.d. | n.d. | n.d. | 0 | 0 | 0 | 0 | 37 | 0 | 0 | 8.7 | 0 | 0 | 0.03 |
| VOC | Ethylbenzene | SO | N | 132 | mg/kg | <0.00013 | 0.0038 | 0.00 | n.d. | 0.00 | n.d. | 0.00 | 28 | 21 | 0 | 0 | 25 | 0 | 0 | 5.8 | 2 | 2 | 0.0017 |
| VOC | Ethylene Dibromide | SO | N | 132 | mg/kg | <7.2E-05 | <0.00032 | n.d. | n.d. | n.d. | n.d. | n.d. | 0 | 0 | 0 | 0 | 0.16 | 0 | 0 | 0.036 | 0 | 0 | 0.0000021 |
| VOC | Isopropylbenzene | SO | N | 132 | mg/kg | <0.0001 | 0.00052 | n.d. | n.d. | n.d. | n.d. | n.d. | 4 | 3 | 0 | 0 | 990 | 0 | 0 | 190 | 0 | 0 | 0.074 |
| VOC | Methyl acetate | SO | N | 132 | mg/kg | <0.00065 | 0.36 | 0.01 | n.d. | 0.05 | n.d. | 0.28 | 39 | 30 | 0.00 | 0 | 120000 | 0 | 0 | 7800 | 0 | 0 | 0.41 |
| VOC | Methyl tert-butyl ether | SO | N | 132 | mg/kg | <0.0001 | <0.00046 | n.d. | n.d. | n.d. | n.d. | n.d. | 0 | 0 | 0.00 | 0 | 210 | 0 | 0 | 47 | 0 | 0 | 0.0032 |
| VOC | Methylcyclohexane | SO | N | 132 | mg/kg | <0.0003 | 0.015 | 0.00 | n.d. | 0.00 | n.d. | 0.01 | 46 | 35 | - | - | - | - | - | - | - | - | - |
| VOC | Methylene Chloride | SO | N | 132 | mg/kg | <0.00019 | 0.0027 | n.d. | n.d. | n.d. | n.d. | n.d. | 5 | 4 | 0 | 0 | 320 | 0 | 0 | 35 | 0 | 0 | 0.0027 |
| VOC | m-Xylene & p-Xylene | SO | N | 132 | mg/kg | <7.9E-05 | 0.0091 | 0.00 | 0.00 | 0.00 | n.d. | 0.00 | 67 | 51 | 0 | 0 | 240 | 0 | 0 | 56 | - | - | - |
| VOC | o-Xylene | SO | N | 132 | mg/kg | <0.00011 | 0.0051 | 0.00 | n.d. | 0.00 | n.d. | 0.00 | 32 | 24 | 0 | 0 | 280 | 0 | 0 | 65 | 0 | 0 | 0.019 |
| VOC | Styrene | SO | N | 132 | mg/kg | <9E-05 | 0.0003 | n.d. | n.d. | n.d. | n.d. | n.d. | 1 | 1 | 0 | 0 | 3500 | 0 | 0 | 600 | 0 | 0 | 0.13 |
| VOC | Tetrachloroethene | SO | N | 132 | mg/kg | <0.00017 | 0.00034 | n.d. | n.d. | n.d. | n.d. | n.d. | 2 | 2 | 0 | 0 | 39 | 0 | 0 | 8.1 | 0 | 0 | 0.0018 |
| VOC | Toluene | SO | N | 132 | mg/kg | <0.00014 | 0.013 | 0.00 | 0.00 | 0.00 | n.d. | 0.01 | 100 | 76 | 0 | 0 | 4700 | 0 | 0 | 490 | 0 | 0 | 0.076 |
| VOC | trans-1,2-Dichloroethene | SO | N | 132 | mg/kg | <0.00023 | <0.0011 | n.d. | n.d. | n.d. | n.d. | n.d. | 0 | 0 | 0 | 0 | 2300 | 0 | 0 | 160 | 0 | 0 | 0.011 |
| VOC | trans-1,3-Dichloropropene | SO | N | 132 | mg/kg | <6E-05 | <0.00027 | n.d. | n.d. | n.d. | n.d. | n.d. | 0 | 0 | - | - | - | - | - | - | - | - | - |
| VOC | Trichloroethene | SO | N | 132 | mg/kg | <0.00016 | <0.0007 | n.d. | n.d. | n.d. | n.d. | n.d. | 0 | 0 | 0.00 | 0 | 1.9 | 0 | 0 | 0.41 | 0 | 0 | 0.0001 |
| VOC | Trichlorofluoromethane | SO | N | 132 | mg/kg | <0.0002 | <0.00092 | n.d. | n.d. | n.d. | n.d. | n.d. | 0 | 0 | 0.00 | 0 | 35000 | 0 | 0 | 2300 | 0 | 0 | 0.33 |
| VOC | Vinyl chloride | SO | N | 132 | mg/kg | <0.00023 | <0.0011 | n.d. | n.d. | n.d. | n.d. | n.d. | 0 | 0 | 0 | 0 | 1.7 | 0 | 0 | 0.059 | 0 | 0 | 0.0000065 |

mg/kg - Milligrams per Kilograms
n.d - Non Detect
LOD - Limit of Detection
Industiral RSL - Environmental Protection Agency Industrial Soil Regional Screening Level
Residential RSL - Environmental Protection Agency Residnetial Soil Regional Screening Level
Risk SSL - Environmental Protection Agency Human Health Protection of Ground Water - Risk-based Soil Screening Level

**Table 10. Site-wide Intermediate Depth Soil Analytical Results Statistical Summary**
**Columbia Falls Aluminum Company, LLC, Phase I Site Characterization, 2000 Aluminum Drive, Columbia Falls, MT**

| | | | | | | | | | | | | | | Industrial RSL | | | Residential RSL | | | Risk SSL | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Group | Analyte | Matrix | No. of Results | Unit | Min | Max | Mean | Median | Standard Deviation | 5th Percentile | 95th Percentile | # > LOD | % > LOD | No. Exceeding | % Exceeding | Action Level | No. Exceeding | % Exceeding | Action Level | No. Exceeding | % Exceeding | Action Level |
| DIOXINFURAN | 1,2,3,4,6,7,8-HpCDD | SO | 13 | mg/kg | <2.7E-08 | 0.0000798 | 0.00 | 0.00 | 0.00 | n.d. | 0.00 | 11 | 85 | - | - | - | - | - | - | - | - | - |
| DIOXINFURAN | 1,2,3,4,6,7,8-HpCDF | SO | 13 | mg/kg | <1.9E-08 | 0.000018 | 0.00 | 0.00 | 0.00 | n.d. | 0.00 | 9 | 69 | - | - | - | - | - | - | - | - | - |
| DIOXINFURAN | 1,2,3,4,7,8,9-HpCDF | SO | 13 | mg/kg | <2.1E-08 | 0.00000029 | n.d. | n.d. | n.d. | n.d. | 0.00 | 1 | 8 | - | - | - | - | - | - | - | - | - |
| DIOXINFURAN | 1,2,3,4,7,8-HxCDD | SO | 13 | mg/kg | <2.1E-08 | 0.00000047 | 0.00 | n.d. | 0.00 | n.d. | 0.00 | 6 | 46 | - | - | - | - | - | - | - | - | - |
| DIOXINFURAN | 1,2,3,4,7,8-HxCDF | SO | 13 | mg/kg | <2.4E-08 | 0.00000235 | 0.00 | 0.00 | 0.00 | n.d. | 0.00 | 9 | 69 | - | - | - | - | - | - | - | - | - |
| DIOXINFURAN | 1,2,3,6,7,8-HxCDD | SO | 13 | mg/kg | <1.9E-08 | 0.00000253 | 0.00 | 0.00 | 0.00 | n.d. | 0.00 | 10 | 77 | - | - | - | - | - | - | - | - | - |
| DIOXINFURAN | 1,2,3,6,7,8-HxCDF | SO | 13 | mg/kg | <2.9E-08 | 0.00000084 | 0.00 | 0.00 | 0.00 | n.d. | 0.00 | 8 | 62 | - | - | - | - | - | - | - | - | - |
| DIOXINFURAN | 1,2,3,7,8,9-HxCDD | SO | 13 | mg/kg | <2.4E-08 | 0.00000099 | 0.00 | 0.00 | 0.00 | n.d. | 0.00 | 10 | 77 | - | - | - | - | - | - | - | - | - |
| DIOXINFURAN | 1,2,3,7,8,9-HxCDF | SO | 13 | mg/kg | <1.5E-08 | 0.00000016 | n.d. | n.d. | n.d. | n.d. | 0.00 | 1 | 8 | - | - | - | - | - | - | - | - | - |
| DIOXINFURAN | 1,2,3,7,8-PeCDD | SO | 13 | mg/kg | <3.2E-08 | 0.00000017 | 0.00 | n.d. | 0.00 | n.d. | 0.00 | 6 | 46 | - | - | - | - | - | - | - | - | - |
| DIOXINFURAN | 1,2,3,7,8-PeCDF | SO | 13 | mg/kg | <2.4E-08 | 0.00000054 | 0.00 | n.d. | 0.00 | n.d. | 0.00 | 4 | 31 | - | - | - | - | - | - | - | - | - |
| DIOXINFURAN | 2,3,4,6,7,8-HxCDF | SO | 13 | mg/kg | <1.5E-08 | 0.00000036 | 0.00 | n.d. | 0.00 | n.d. | 0.00 | 5 | 38 | - | - | - | - | - | - | - | - | - |
| DIOXINFURAN | 2,3,4,7,8-PeCDF | SO | 13 | mg/kg | <2.5E-08 | 0.00000048 | 0.00 | n.d. | 0.00 | n.d. | 0.00 | 4 | 31 | - | - | - | - | - | - | - | - | - |
| DIOXINFURAN | 2,3,7,8-TCDD | SO | 13 | mg/kg | <2.8E-08 | <1.6E-07 | n.d. | n.d. | n.d. | n.d. | n.d. | 0 | 0 | 0 | 0 | 0.000022 | 0 | 0 | 0.0000048 | 0 | 0 | 0.000000059 |
| DIOXINFURAN | 2,3,7,8-TCDF | SO | 13 | mg/kg | <2.1E-08 | 0.00000081 | 0.00 | 0.00 | 0.00 | n.d. | 0.00 | 10 | 77 | - | - | - | - | - | - | - | - | - |
| DIOXINFURAN | OCDD | SO | 13 | mg/kg | 0.00000239 | 0.00116 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 13 | 100 | - | - | - | - | - | - | - | - | - |
| DIOXINFURAN | OCDF | SO | 13 | mg/kg | <2.3E-08 | 0.0000234 | 0.00 | 0.00 | 0.00 | n.d. | 0.00 | 8 | 62 | - | - | - | - | - | - | - | - | - |
| DIOXINFURAN | Total HpCDD | SO | 13 | mg/kg | 0.00000064 | 0.000142 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 13 | 100 | - | - | - | - | - | - | - | - | - |
| DIOXINFURAN | Total HpCDF | SO | 13 | mg/kg | 0.00000024 | 0.000066 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 13 | 100 | - | - | - | - | - | - | - | - | - |
| DIOXINFURAN | Total HxCDD | SO | 13 | mg/kg | <9.2E-08 | 0.00000849 | 0.00 | 0.00 | 0.00 | n.d. | 0.00 | 12 | 92 | - | - | - | - | - | - | - | - | - |
| DIOXINFURAN | Total HxCDF | SO | 13 | mg/kg | <4E-08 | 0.0000458 | 0.00 | 0.00 | 0.00 | n.d. | 0.00 | 11 | 85 | - | - | - | - | - | - | - | - | - |
| DIOXINFURAN | Total PeCDD | SO | 13 | mg/kg | <3.2E-08 | 0.00000046 | 0.00 | 0.00 | 0.00 | n.d. | 0.00 | 7 | 54 | - | - | - | - | - | - | - | - | - |
| DIOXINFURAN | Total PeCDF | SO | 13 | mg/kg | <2.6E-08 | 0.00000656 | 0.00 | 0.00 | 0.00 | n.d. | 0.00 | 9 | 69 | - | - | - | - | - | - | - | - | - |
| DIOXINFURAN | Total TCDD | SO | 13 | mg/kg | <3E-08 | 0.0000004 | 0.00 | 0.00 | 0.00 | n.d. | 0.00 | 9 | 69 | - | - | - | - | - | - | - | - | - |
| DIOXINFURAN | Total TCDF | SO | 13 | mg/kg | <2.1E-08 | 0.00000223 | 0.00 | 0.00 | 0.00 | n.d. | 0.00 | 10 | 77 | - | - | - | - | - | - | - | - | - |
| GENCHEM | Fluoride | SO | 135 | mg/kg | <0.19 | 293 | 19.73 | 8.08 | 39.44 | 0.90 | 83.62 | 132 | 98 | 0.00 | 0 | 4700 | 0 | 0 | 310 | 49 | 36 | 12 |
| GENCHEM | Total Organic Carbon (1) | SO | 17 | mg/kg | 866 | 316000 | 31580.35 | 16600.00 | 73590.06 | 1197.20 | 81760.00 | 17 | 100 | - | - | - | - | - | - | - | - | - |
| METALS | Aluminum | SO | 135 | mg/kg | 2840 | 85500 | 8187.85 | 7270.00 | 7130.87 | 4593.00 | 11520.00 | 135 | 100 | 0.00 | 0 | 110000 | 54 | 40 | 7700 | 134 | 99 | 3000 |
| METALS | Antimony | SO | 135 | mg/kg | <0.26 | 0.88 | n.d. | n.d. | n.d. | n.d. | n.d. | 3 | 2 | 0 | 0 | 47 | 0 | 0 | 3.1 | 3 | 2 | 0.035 |
| METALS | Arsenic | SO | 135 | mg/kg | 0.53 | 34.2 | 4.16 | 3.60 | 3.06 | 2.04 | 7.14 | 135 | 100 | 106.00 | 79 | 3 | 134 | 99 | 0.68 | 135 | 100 | 0.0015 |
| METALS | Barium | SO | 135 | mg/kg | 22.7 | 510 | 74.38 | 63.00 | 50.85 | 35.22 | 133.00 | 135 | 100 | 0.00 | 0 | 22000 | 0 | 0 | 1500 | 135 | 100 | 16 |
| METALS | Beryllium | SO | 135 | mg/kg | 0.097 | 32.7 | 0.58 | 0.33 | 2.79 | 0.21 | 0.51 | 135 | 100 | 0.00 | 0 | 230 | 1 | 1 | 16 | 1 | 1 | 1.9 |
| METALS | Cadmium | SO | 135 | mg/kg | <0.23 | 8 | n.d. | n.d. | n.d. | n.d. | n.d. | 3 | 2 | 0 | 0 | 98 | 1 | 1 | 7.1 | 3 | 2 | 0.069 |
| METALS | Calcium | SO | 135 | mg/kg | 1100 | 130000 | 34081.26 | 32300.00 | 21313.06 | 7352.00 | 65470.00 | 135 | 100 | - | - | - | - | - | - | - | - | - |
| METALS | Chromium | SO | 135 | mg/kg | 2.9 | 27.5 | 9.52 | 9.10 | 2.96 | 6.30 | 14.18 | 135 | 100 | - | - | - | - | - | - | - | - | - |
| METALS | Cobalt | SO | 135 | mg/kg | 1.9 | 8 | 4.63 | 4.50 | 1.09 | 2.87 | 6.39 | 135 | 100 | 0.00 | 0 | 35 | 131 | 97 | 2.3 | 135 | 100 | 0.027 |
| METALS | Copper | SO | 135 | mg/kg | 3.7 | 36.7 | 11.99 | 11.20 | 4.67 | 5.50 | 19.43 | 135 | 100 | 0.00 | 0 | 4700 | 0 | 0 | 310 | 135 | 100 | 2.8 |

**Table 10. Site-wide Intermediate Depth Soil Analytical Results Statistical Summary**
**Columbia Falls Aluminum Company, LLC, Phase I Site Characterization, 2000 Aluminum Drive, Columbia Falls, MT**

| | | | | | | | | | | | | | | Industrial RSL | | | Residential RSL | | | Risk SSL | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Group | Analyte | Matrix | No. of Results | Unit | Min | Max | Mean | Median | Standard Deviation | 5th Percentile | 95th Percentile | # > LOD | % > LOD | No. Exceeding | % Exceeding | Action Level | No. Exceeding | % Exceeding | Action Level | No. Exceeding | % Exceeding | Action Level |
| METALS | Cyanide, Total | SO | 135 | mg/kg | <0.014 | 15.3 | 0.19 | 0.02 | 1.36 | n.d. | 0.56 | 76 | 56 | 1 | 1 | 15 | 2 | 1 | 2.3 | 76 | 56 | 0.0015 |
| METALS | Iron | SO | 135 | mg/kg | 4860 | 17900 | 11760.67 | 11900.00 | 2332.33 | 8223.00 | 15760.00 | 135 | 100 | 0.00 | 0 | 82000 | 134 | 99 | 5500 | 135 | 100 | 35 |
| METALS | Lead | SO | 135 | mg/kg | 1.8 | 104 | 7.37 | 6.00 | 8.95 | 3.24 | 12.39 | 135 | 100 | 0.00 | 0 | 800 | 0 | 0 | 400 | - | - | - |
| METALS | Magnesium | SO | 135 | mg/kg | 4710 | 24800 | 11031.85 | 10900.00 | 3147.90 | 6792.00 | 15960.00 | 135 | 100 | - | - | - | - | - | - | - | - | - |
| METALS | Manganese | SO | 135 | mg/kg | 73.4 | 855 | 328.56 | 328.00 | 117.04 | 118.50 | 498.50 | 135 | 100 | 0.00 | 0 | 2600 | 124 | 92 | 180 | 135 | 100 | 2.8 |
| METALS | Mercury | SO | 135 | mg/kg | <0.011 | 0.064 | 0.01 | 0.01 | 0.01 | n.d. | 0.03 | 101 | 75 | 0 | 0 | 4.6 | 0 | 0 | 1.1 | 101 | 75 | 0.0033 |
| METALS | Nickel | SO | 135 | mg/kg | 3.5 | 252 | 11.38 | 9.40 | 20.99 | 6.44 | 13.50 | 135 | 100 | 0.00 | 0 | 2200 | 1 | 1 | 150 | 135 | 100 | 2.6 |
| METALS | Potassium | SO | 135 | mg/kg | 168 | 5050 | 722.12 | 656.00 | 451.74 | 421.30 | 1142.00 | 135 | 100 | - | - | - | - | - | - | - | - | - |
| METALS | Selenium | SO | 135 | mg/kg | <0.24 | 1.4 | n.d. | n.d. | n.d. | n.d. | n.d. | 3 | 2 | 0 | 0 | 580 | 0 | 0 | 39 | 3 | 2 | 0.052 |
| METALS | Silver | SO | 135 | mg/kg | <0.51 | <0.98 | n.d. | n.d. | n.d. | n.d. | n.d. | 0 | 0 | 0 | 0 | 580 | 0 | 0 | 39 | 0 | 0 | 0.08 |
| METALS | Sodium | SO | 135 | mg/kg | <29 | 2820 | 79.15 | 31.30 | 312.35 | n.d. | 432.75 | 68 | 50 | - | - | - | - | - | - | - | - | - |
| METALS | Thallium | SO | 135 | mg/kg | <0.1 | 2.2 | n.d. | n.d. | n.d. | n.d. | n.d. | 5 | 4 | 1 | 1 | 1.2 | 5 | 4 | 0.078 | 5 | 4 | 0.0014 |
| METALS | Vanadium | SO | 135 | mg/kg | 3.2 | 166 | 9.07 | 7.50 | 13.84 | 4.54 | 13.11 | 135 | 100 | 0.00 | 0 | 580 | 1 | 1 | 39 | 44 | 33 | 8.6 |
| METALS | Zinc | SO | 135 | mg/kg | 11.3 | 403 | 34.75 | 31.50 | 32.81 | 19.77 | 45.03 | 135 | 100 | 0.00 | 0 | 35000 | 0 | 0 | 2300 | 31 | 23 | 37 |
| OC_PEST | 4,4'-DDD | SO | 1 | mg/kg | <0.00093 | <0.00093 | n.d. | n.d. | n.d. | n.d. | n.d. | 0 | 0 | 0 | 0 | 9.6 | 0 | 0 | 2.3 | 0 | 0 | 0.0075 |
| OC_PEST | 4,4'-DDE | SO | 1 | mg/kg | <0.001 | <0.001 | n.d. | n.d. | n.d. | n.d. | n.d. | 0 | 0 | 0.00 | 0 | 9.3 | 0 | 0 | 2 | 0 | 0 | 0.011 |
| OC_PEST | 4,4'-DDT | SO | 1 | mg/kg | <0.00073 | <0.00073 | n.d. | n.d. | n.d. | n.d. | n.d. | 0 | 0 | 0 | 0 | 8.5 | 0 | 0 | 1.9 | 0 | 0 | 0.077 |
| OC_PEST | Aldrin | SO | 1 | mg/kg | <0.00086 | <0.00086 | n.d. | n.d. | n.d. | n.d. | n.d. | 0 | 0 | 0 | 0 | 0.18 | 0 | 0 | 0.039 | 0 | 0 | 0.00015 |
| OC_PEST | alpha-BHC | SO | 1 | mg/kg | <0.00065 | <0.00065 | n.d. | n.d. | n.d. | n.d. | n.d. | 0 | 0 | 0 | 0 | 0.36 | 0 | 0 | 0.086 | 0 | 0 | 0.000042 |
| OC_PEST | alpha-Chlordane | SO | 1 | mg/kg | <0.0012 | <0.0012 | n.d. | n.d. | n.d. | n.d. | n.d. | 0 | 0 | - | - | - | - | - | - | - | - | - |
| OC_PEST | beta-BHC | SO | 1 | mg/kg | <0.00069 | <0.00069 | n.d. | n.d. | n.d. | n.d. | n.d. | 0 | 0 | 0 | 0 | 1.3 | 0 | 0 | 0.3 | 0 | 0 | 0.00015 |
| OC_PEST | delta-BHC | SO | 1 | mg/kg | <0.00077 | <0.00077 | n.d. | n.d. | n.d. | n.d. | n.d. | 0 | 0 | - | - | - | - | - | - | - | - | - |
| OC_PEST | Dieldrin | SO | 1 | mg/kg | <0.00092 | <0.00092 | n.d. | n.d. | n.d. | n.d. | n.d. | 0 | 0 | 0 | 0 | 0.14 | 0 | 0 | 0.034 | 0 | 0 | 0.000071 |
| OC_PEST | Endosulfan I | SO | 1 | mg/kg | <0.00098 | <0.00098 | n.d. | n.d. | n.d. | n.d. | n.d. | 0 | 0 | - | - | - | - | - | - | - | - | - |
| OC_PEST | Endosulfan II | SO | 1 | mg/kg | <0.0011 | <0.0011 | n.d. | n.d. | n.d. | n.d. | n.d. | 0 | 0 | - | - | - | - | - | - | - | - | - |
| OC_PEST | Endosulfan sulfate | SO | 1 | mg/kg | <0.00083 | <0.00083 | n.d. | n.d. | n.d. | n.d. | n.d. | 0 | 0 | - | - | - | - | - | - | - | - | - |
| OC_PEST | Endrin | SO | 1 | mg/kg | <0.0009 | <0.0009 | n.d. | n.d. | n.d. | n.d. | n.d. | 0 | 0 | 0 | 0 | 25 | 0 | 0 | 1.9 | 0 | 0 | 0.0092 |
| OC_PEST | Endrin aldehyde | SO | 1 | mg/kg | <0.00088 | <0.00088 | n.d. | n.d. | n.d. | n.d. | n.d. | 0 | 0 | - | - | - | - | - | - | - | - | - |
| OC_PEST | Endrin ketone | SO | 1 | mg/kg | <0.00098 | <0.00098 | n.d. | n.d. | n.d. | n.d. | n.d. | 0 | 0 | - | - | - | - | - | - | - | - | - |
| OC_PEST | gamma-BHC (Lindane) | SO | 1 | mg/kg | <0.00064 | <0.00064 | n.d. | n.d. | n.d. | n.d. | n.d. | 0 | 0 | 0 | 0 | 2.5 | 0 | 0 | 0.57 | 0 | 0 | 0.00024 |
| OC_PEST | gamma-Chlordane | SO | 1 | mg/kg | <0.0015 | <0.0015 | n.d. | n.d. | n.d. | n.d. | n.d. | 0 | 0 | - | - | - | - | - | - | - | - | - |
| OC_PEST | Heptachlor | SO | 1 | mg/kg | <0.00091 | <0.00091 | n.d. | n.d. | n.d. | n.d. | n.d. | 0 | 0 | 0 | 0 | 0.63 | 0 | 0 | 0.13 | 0 | 0 | 0.00012 |
| OC_PEST | Heptachlor epoxide | SO | 1 | mg/kg | <0.0014 | <0.0014 | n.d. | n.d. | n.d. | n.d. | n.d. | 0 | 0 | 0 | 0 | 0.33 | 0 | 0 | 0.07 | 0 | 0 | 0.000028 |
| OC_PEST | Methoxychlor | SO | 1 | mg/kg | <0.0015 | <0.0015 | n.d. | n.d. | n.d. | n.d. | n.d. | 0 | 0 | 0 | 0 | 410 | 0 | 0 | 32 | 0 | 0 | 0.2 |
| OC_PEST | Toxaphene | SO | 1 | mg/kg | <0.021 | <0.021 | n.d. | n.d. | n.d. | n.d. | n.d. | 0 | 0 | 0 | 0 | 2.1 | 0 | 0 | 0.49 | 0 | 0 | 0.011 |
| PCB | Aroclor 1016 | SO | 135 | mg/kg | <0.009 | <0.012 | n.d. | n.d. | n.d. | n.d. | n.d. | 0 | 0 | 0.00 | 0 | 5.1 | 0 | 0 | 0.41 | 0 | 0 | 0.013 |
| PCB | Aroclor 1221 | SO | 135 | mg/kg | <0.009 | <0.012 | n.d. | n.d. | n.d. | n.d. | n.d. | 0 | 0 | 0 | 0 | 0.83 | 0 | 0 | 0.2 | 0 | 0 | 0.00008 |

**Table 10. Site-wide Intermediate Depth Soil Analytical Results Statistical Summary**
**Columbia Falls Aluminum Company, LLC, Phase I Site Characterization, 2000 Aluminum Drive, Columbia Falls, MT**

| Group | Analyte | Matrix | No. of Results | Unit | Min | Max | Mean | Median | Standard Deviation | 5th Percentile | 95th Percentile | # > LOD | % > LOD | Industrial RSL No. Exceeding | Industrial RSL % Exceeding | Industrial RSL Action Level | Residential RSL No. Exceeding | Residential RSL % Exceeding | Residential RSL Action Level | Risk SSL No. Exceeding | Risk SSL % Exceeding | Risk SSL Action Level |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| PCB | Aroclor 1232 | SO | 135 | mg/kg | <0.009 | <0.012 | n.d. | n.d. | n.d. | n.d. | n.d. | 0 | 0 | 0 | 0 | 0.72 | 0 | 0 | 0.17 | 0 | 0 | 0.00008 |
| PCB | Aroclor 1242 | SO | 135 | mg/kg | <0.009 | <0.012 | n.d. | n.d. | n.d. | n.d. | n.d. | 0 | 0 | 0 | 0 | 0.95 | 0 | 0 | 0.23 | 0 | 0 | 0.0012 |
| PCB | Aroclor 1248 | SO | 135 | mg/kg | <0.009 | <0.012 | n.d. | n.d. | n.d. | n.d. | n.d. | 0 | 0 | 0 | 0 | 0.95 | 0 | 0 | 0.23 | 0 | 0 | 0.0012 |
| PCB | Aroclor 1254 | SO | 135 | mg/kg | <0.0093 | <0.013 | n.d. | n.d. | n.d. | n.d. | n.d. | 0 | 0 | 0 | 0 | 0.97 | 0 | 0 | 0.12 | 0 | 0 | 0.002 |
| PCB | Aroclor 1260 | SO | 135 | mg/kg | <0.0093 | <0.013 | n.d. | n.d. | n.d. | n.d. | n.d. | 0 | 0 | 0 | 0 | 0.99 | 0 | 0 | 0.24 | 0 | 0 | 0.0055 |
| PCB | Aroclor 1268 | SO | 135 | mg/kg | <0.0093 | <0.013 | n.d. | n.d. | n.d. | n.d. | n.d. | 0 | 0 | - | - | - | - | - | - | - | - | - |
| PCB | Aroclor-1262 | SO | 135 | mg/kg | <0.0093 | <0.013 | n.d. | n.d. | n.d. | n.d. | n.d. | 0 | 0 | - | - | - | - | - | - | - | - | - |
| PCB | Polychlorinated biphenyls, Total | SO | 135 | mg/kg | <0.0093 | <0.013 | n.d. | n.d. | n.d. | n.d. | n.d. | 0 | 0 | 0 | 0 | 0.94 | 0 | 0 | 0.23 | 0 | 0 | 0.0068 |
| SVOC | 1,1'-Biphenyl | SO | 135 | mg/kg | <0.029 | 1.2 | n.d. | n.d. | n.d. | n.d. | n.d. | 4 | 3 | 0 | 0 | 20 | 0 | 0 | 4.7 | 4 | 3 | 0.00087 |
| SVOC | 1,2,4,5-Tetrachlorobenzene | SO | 135 | mg/kg | <0.025 | <0.13 | n.d. | n.d. | n.d. | n.d. | n.d. | 0 | 0 | 0 | 0 | 35 | 0 | 0 | 2.3 | 0 | 0 | 0.00079 |
| SVOC | 1,4-Dioxane | SO | 135 | mg/kg | <0.089 | <0.48 | n.d. | n.d. | n.d. | n.d. | n.d. | 0 | 0 | 0 | 0 | 24 | 0 | 0 | 5.3 | 0 | 0 | 0.000094 |
| SVOC | 2,2'-oxybis[1-chloropropane] | SO | 135 | mg/kg | <0.014 | <0.075 | n.d. | n.d. | n.d. | n.d. | n.d. | 0 | 0 | 0 | 0 | 4700 | 0 | 0 | 310 | 0 | 0 | 0.026 |
| SVOC | 2,3,4,6-Tetrachlorophenol | SO | 135 | mg/kg | <0.031 | <0.17 | n.d. | n.d. | n.d. | n.d. | n.d. | 0 | 0 | 0 | 0 | 2500 | 0 | 0 | 190 | 0 | 0 | 0.018 |
| SVOC | 2,4,5-Trichlorophenol | SO | 135 | mg/kg | <0.033 | <0.18 | n.d. | n.d. | n.d. | n.d. | n.d. | 0 | 0 | 0 | 0 | 8200 | 0 | 0 | 630 | 0 | 0 | 0.4 |
| SVOC | 2,4,6-Trichlorophenol | SO | 135 | mg/kg | <0.0095 | <0.052 | n.d. | n.d. | n.d. | n.d. | n.d. | 0 | 0 | 0 | 0 | 82 | 0 | 0 | 6.3 | 0 | 0 | 0.0012 |
| SVOC | 2,4-Dichlorophenol | SO | 135 | mg/kg | <0.0079 | <0.043 | n.d. | n.d. | n.d. | n.d. | n.d. | 0 | 0 | 0.00 | 0 | 250 | 0 | 0 | 19 | 0 | 0 | 0.0023 |
| SVOC | 2,4-Dimethylphenol | SO | 135 | mg/kg | <0.074 | <0.4 | n.d. | n.d. | n.d. | n.d. | n.d. | 0 | 0 | 0 | 0 | 1600 | 0 | 0 | 130 | 0 | 0 | 0.042 |
| SVOC | 2,4-Dinitrophenol | SO | 135 | mg/kg | <0.25 | <1.4 | n.d. | n.d. | n.d. | n.d. | n.d. | 0 | 0 | 0 | 0 | 160 | 0 | 0 | 13 | 0 | 0 | 0.0044 |
| SVOC | 2,4-Dinitrotoluene | SO | 135 | mg/kg | <0.013 | <0.072 | n.d. | n.d. | n.d. | n.d. | n.d. | 0 | 0 | 0 | 0 | 7.4 | 0 | 0 | 1.7 | 0 | 0 | 0.00032 |
| SVOC | 2,6-Dinitrotoluene | SO | 135 | mg/kg | <0.018 | <0.096 | n.d. | n.d. | n.d. | n.d. | n.d. | 0 | 0 | 0 | 0 | 1.5 | 0 | 0 | 0.36 | 0 | 0 | 0.000067 |
| SVOC | 2-Chloronaphthalene | SO | 135 | mg/kg | <0.0076 | <0.041 | n.d. | n.d. | n.d. | n.d. | n.d. | 0 | 0 | 0 | 0 | 6000 | 0 | 0 | 480 | 0 | 0 | 0.39 |
| SVOC | 2-Chlorophenol | SO | 135 | mg/kg | <0.0085 | <0.046 | n.d. | n.d. | n.d. | n.d. | n.d. | 0 | 0 | 0 | 0 | 580 | 0 | 0 | 39 | 0 | 0 | 0.0089 |
| SVOC | 2-Methylnaphthalene | SO | 135 | mg/kg | <0.0074 | 24 | 0.23 | n.d. | 2.10 | n.d. | 4.22 | 22 | 16 | 0 | 0 | 300 | 0 | 0 | 24 | 18 | 13 | 0.019 |
| SVOC | 2-Methylphenol | SO | 135 | mg/kg | <0.015 | <0.079 | n.d. | n.d. | n.d. | n.d. | n.d. | 0 | 0 | 0 | 0 | 4100 | 0 | 0 | 320 | 0 | 0 | 0.075 |
| SVOC | 2-Nitroaniline | SO | 135 | mg/kg | <0.011 | <0.06 | n.d. | n.d. | n.d. | n.d. | n.d. | 0 | 0 | 0 | 0 | 800 | 0 | 0 | 63 | 0 | 0 | 0.008 |
| SVOC | 2-Nitrophenol | SO | 135 | mg/kg | <0.011 | <0.061 | n.d. | n.d. | n.d. | n.d. | n.d. | 0 | 0 | - | - | - | - | - | - | - | - | - |
| SVOC | 3 & 4 Methylphenol | SO | 135 | mg/kg | <0.0089 | 0.029 | n.d. | n.d. | n.d. | n.d. | n.d. | 2 | 1 | - | - | - | - | - | - | - | - | - |
| SVOC | 3,3'-Dichlorobenzidine | SO | 135 | mg/kg | <0.037 | <0.2 | n.d. | n.d. | n.d. | n.d. | n.d. | 0 | 0 | 0 | 0 | 5.1 | 0 | 0 | 1.2 | 0 | 0 | 0.00082 |
| SVOC | 3-Nitroaniline | SO | 135 | mg/kg | <0.0099 | <0.054 | n.d. | n.d. | n.d. | n.d. | n.d. | 0 | 0 | - | - | - | - | - | - | - | - | - |
| SVOC | 4,6-Dinitro-2-methylphenol | SO | 135 | mg/kg | <0.089 | <0.48 | n.d. | n.d. | n.d. | n.d. | n.d. | 0 | 0 | 0 | 0 | 6.6 | 0 | 0 | 0.51 | 0 | 0 | 0.00026 |
| SVOC | 4-Bromophenyl phenyl ether | SO | 135 | mg/kg | <0.011 | <0.057 | n.d. | n.d. | n.d. | n.d. | n.d. | 0 | 0 | - | - | - | - | - | - | - | - | - |
| SVOC | 4-Chloro-3-methylphenol | SO | 135 | mg/kg | <0.014 | <0.078 | n.d. | n.d. | n.d. | n.d. | n.d. | 0 | 0 | 0 | 0 | 8200 | 0 | 0 | 630 | 0 | 0 | 0.17 |
| SVOC | 4-Chloroaniline | SO | 135 | mg/kg | <0.0086 | <0.047 | n.d. | n.d. | n.d. | n.d. | n.d. | 0 | 0 | 0 | 0 | 11 | 0 | 0 | 2.7 | 0 | 0 | 0.00016 |
| SVOC | 4-Chlorophenyl phenyl ether | SO | 135 | mg/kg | <0.01 | <0.054 | n.d. | n.d. | n.d. | n.d. | n.d. | 0 | 0 | - | - | - | - | - | - | - | - | - |
| SVOC | 4-Nitroaniline | SO | 135 | mg/kg | <0.013 | <0.069 | n.d. | n.d. | n.d. | n.d. | n.d. | 0 | 0 | 0 | 0 | 110 | 0 | 0 | 25 | 0 | 0 | 0.0016 |
| SVOC | 4-Nitrophenol | SO | 135 | mg/kg | <0.16 | <0.87 | n.d. | n.d. | n.d. | n.d. | n.d. | 0 | 0 | - | - | - | - | - | - | - | - | - |
| SVOC | Acenaphthene | SO | 135 | mg/kg | <0.0081 | 55 | 0.50 | n.d. | 4.75 | n.d. | 3.71 | 30 | 22 | 0 | 0 | 4500 | 0 | 0 | 360 | 5 | 4 | 0.55 |

**Table 10. Site-wide Intermediate Depth Soil Analytical Results Statistical Summary**
**Columbia Falls Aluminum Company, LLC, Phase I Site Characterization, 2000 Aluminum Drive, Columbia Falls, MT**

| Group | Analyte | Matrix | No. of Results | Unit | Min | Max | Mean | Median | Standard Deviation | 5th Percentile | 95th Percentile | # > LOD | % > LOD | Industrial RSL | | | Residential RSL | | | Risk SSL | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | | | | | | | No. Exceeding | % Exceeding | Action Level | No. Exceeding | % Exceeding | Action Level | No. Exceeding | % Exceeding | Action Level |
| SVOC | Acenaphthylene | SO | 135 | mg/kg | <0.0086 | 0.059 | n.d. | n.d. | n.d. | n.d. | n.d. | 1 | 1 | - | - | - | - | - | - | - | - | - |
| SVOC | Acetophenone | SO | 135 | mg/kg | <0.0073 | 0.0077 | n.d. | n.d. | n.d. | n.d. | n.d. | 1 | 1 | 0 | 0 | 12000 | 0 | 0 | 780 | 0 | 0 | 0.058 |
| SVOC | Anthracene | SO | 135 | mg/kg | <0.032 | 100 | n.d. | n.d. | n.d. | n.d. | 21.04 | 18 | 13 | 0.00 | 0 | 23000 | 0 | 0 | 1800 | 2 | 1 | 5.8 |
| SVOC | Atrazine | SO | 135 | mg/kg | <0.015 | <0.081 | n.d. | n.d. | n.d. | n.d. | n.d. | 0 | 0 | 0 | 0 | 10 | 0 | 0 | 2.4 | 0 | 0 | 0.0002 |
| SVOC | Benzaldehyde | SO | 135 | mg/kg | <0.026 | <0.14 | n.d. | n.d. | n.d. | n.d. | n.d. | 0 | 0 | 0 | 0 | 820 | 0 | 0 | 170 | 0 | 0 | 0.0041 |
| SVOC | Benzo[a]anthracene | SO | 135 | mg/kg | <0.028 | 400 | 3.45 | n.d. | 34.45 | n.d. | 11.20 | 46 | 34 | 8 | 6 | 2.9 | 20 | 15 | 0.16 | 46 | 34 | 0.0042 |
| SVOC | Benzo[a]pyrene | SO | 135 | mg/kg | <0.01 | 450 | 3.90 | n.d. | 38.77 | n.d. | 8.00 | 61 | 45 | 16 | 12 | 0.29 | 55 | 41 | 0.016 | 61 | 45 | 0.004 |
| SVOC | Benzo[b]fluoranthene | SO | 135 | mg/kg | <0.013 | 570 | 4.93 | n.d. | 49.09 | n.d. | 9.92 | 65 | 48 | 7 | 5 | 2.9 | 32 | 24 | 0.16 | 50 | 37 | 0.041 |
| SVOC | Benzo[g,h,i]perylene | SO | 135 | mg/kg | <0.019 | 290 | 2.71 | n.d. | 25.06 | n.d. | 10.07 | 53 | 39 | - | - | - | - | - | - | - | - | - |
| SVOC | Benzo[k]fluoranthene | SO | 135 | mg/kg | <0.015 | 210 | 1.83 | n.d. | 18.10 | n.d. | 5.86 | 47 | 35 | 1 | 1 | 29 | 7 | 5 | 1.6 | 11 | 8 | 0.4 |
| SVOC | Bis(2-chloroethoxy)methane | SO | 135 | mg/kg | <0.01 | 0.015 | n.d. | n.d. | n.d. | n.d. | n.d. | 1 | 1 | 0.00 | 0 | 250 | 0 | 0 | 19 | 1 | 1 | 0.0013 |
| SVOC | Bis(2-chloroethyl)ether | SO | 135 | mg/kg | <0.0079 | <0.043 | n.d. | n.d. | n.d. | n.d. | n.d. | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0.23 | 0 | 0 | 0.0000036 |
| SVOC | Bis(2-ethylhexyl) phthalate | SO | 135 | mg/kg | <0.013 | 5.1 | n.d. | n.d. | n.d. | n.d. | 1.39 | 16 | 12 | 0 | 0 | 160 | 0 | 0 | 39 | 1 | 1 | 1.3 |
| SVOC | Butyl benzyl phthalate | SO | 135 | mg/kg | <0.01 | 6.3 | n.d. | n.d. | n.d. | n.d. | 4.43 | 7 | 5 | 0 | 0 | 1200 | 0 | 0 | 290 | 1 | 1 | 0.24 |
| SVOC | Caprolactam | SO | 135 | mg/kg | <0.024 | <0.13 | n.d. | n.d. | n.d. | n.d. | n.d. | 0 | 0 | 0 | 0 | 40000 | 0 | 0 | 3100 | 0 | 0 | 0.25 |
| SVOC | Carbazole | SO | 135 | mg/kg | <0.0083 | 42 | 0.39 | n.d. | 3.63 | n.d. | 2.14 | 39 | 29 | - | - | - | - | - | - | - | - | - |
| SVOC | Chrysene | SO | 135 | mg/kg | <0.0091 | 500 | 4.35 | n.d. | 43.07 | n.d. | 8.10 | 65 | 48 | 1.00 | 1 | 290 | 2 | 1 | 16 | 10 | 7 | 1.2 |
| SVOC | Dibenz(a,h)anthracene | SO | 135 | mg/kg | <0.017 | 6.2 | 0.14 | n.d. | 0.66 | n.d. | 2.48 | 36 | 27 | 7 | 5 | 0.29 | 36 | 27 | 0.016 | 36 | 27 | 0.013 |
| SVOC | Dibenzofuran | SO | 135 | mg/kg | <0.01 | 15 | n.d. | n.d. | n.d. | n.d. | 3.21 | 19 | 14 | 0 | 0 | 100 | 1 | 1 | 7.3 | 16 | 12 | 0.015 |
| SVOC | Diethyl phthalate | SO | 135 | mg/kg | <0.0095 | <0.052 | n.d. | n.d. | n.d. | n.d. | n.d. | 0 | 0 | 0 | 0 | 66000 | 0 | 0 | 5100 | 0 | 0 | 0.61 |
| SVOC | Dimethyl phthalate | SO | 135 | mg/kg | <0.0097 | <0.053 | n.d. | n.d. | n.d. | n.d. | n.d. | 0 | 0 | - | - | - | - | - | - | - | - | - |
| SVOC | Di-n-butyl phthalate | SO | 135 | mg/kg | <0.01 | 0.66 | n.d. | n.d. | n.d. | n.d. | 0.25 | 16 | 12 | 0 | 0 | 8200 | 0 | 0 | 630 | 1 | 1 | 0.23 |
| SVOC | Di-n-octyl phthalate | SO | 135 | mg/kg | <0.017 | 0.2 | n.d. | n.d. | n.d. | n.d. | n.d. | 1 | 1 | 0 | 0 | 820 | 0 | 0 | 63 | 0 | 0 | 5.7 |
| SVOC | Fluoranthene | SO | 135 | mg/kg | <0.0099 | 1000 | 8.35 | 0.01 | 86.10 | n.d. | 17.30 | 69 | 51 | 0.00 | 0 | 3000 | 1 | 1 | 240 | 5 | 4 | 8.9 |
| SVOC | Fluorene | SO | 135 | mg/kg | <0.0073 | 33 | 0.36 | n.d. | 2.92 | n.d. | 5.92 | 29 | 21 | 0.00 | 0 | 3000 | 0 | 0 | 240 | 5 | 4 | 0.54 |
| SVOC | Hexachlorobenzene | SO | 135 | mg/kg | <0.014 | <0.073 | n.d. | n.d. | n.d. | n.d. | n.d. | 0 | 0 | 0.00 | 0 | 0.96 | 0 | 0 | 0.21 | 0 | 0 | 0.00012 |
| SVOC | Hexachlorobutadiene | SO | 135 | mg/kg | <0.0094 | <0.051 | n.d. | n.d. | n.d. | n.d. | n.d. | 0 | 0 | 0 | 0 | 5.3 | 0 | 0 | 1.2 | 0 | 0 | 0.00027 |
| SVOC | Hexachlorocyclopentadiene | SO | 135 | mg/kg | <0.021 | <0.11 | n.d. | n.d. | n.d. | n.d. | n.d. | 0 | 0 | 0 | 0 | 0.75 | 0 | 0 | 0.18 | 0 | 0 | 0.00013 |
| SVOC | Hexachloroethane | SO | 135 | mg/kg | <0.012 | <0.066 | n.d. | n.d. | n.d. | n.d. | n.d. | 0 | 0 | 0 | 0 | 8 | 0 | 0 | 1.8 | 0 | 0 | 0.0002 |
| SVOC | Indeno[1,2,3-cd]pyrene | SO | 135 | mg/kg | <0.022 | 360 | 3.21 | n.d. | 31.05 | n.d. | 10.00 | 52 | 39 | 7 | 5 | 2.9 | 22 | 16 | 0.16 | 26 | 19 | 0.13 |
| SVOC | Isophorone | SO | 135 | mg/kg | <0.0072 | 2.1 | n.d. | n.d. | n.d. | n.d. | n.d. | 6 | 4 | 0.00 | 0 | 2400 | 0 | 0 | 570 | 5 | 4 | 0.026 |
| SVOC | Naphthalene | SO | 135 | mg/kg | <0.0085 | 9.2 | 0.17 | n.d. | 1.06 | n.d. | 7.39 | 23 | 17 | 0.00 | 0 | 17 | 2 | 1 | 3.8 | 23 | 17 | 0.00054 |
| SVOC | Nitrobenzene | SO | 135 | mg/kg | <0.011 | <0.057 | n.d. | n.d. | n.d. | n.d. | n.d. | 0 | 0 | 0 | 0 | 22 | 0 | 0 | 5.1 | 0 | 0 | 0.000092 |
| SVOC | N-Nitrosodi-n-propylamine | SO | 135 | mg/kg | <0.011 | <0.061 | n.d. | n.d. | n.d. | n.d. | n.d. | 0 | 0 | 0 | 0 | 0.33 | 0 | 0 | 0.078 | 0 | 0 | 0.0000081 |
| SVOC | N-Nitrosodiphenylamine | SO | 135 | mg/kg | <0.03 | <0.16 | n.d. | n.d. | n.d. | n.d. | n.d. | 0 | 0 | 0 | 0 | 470 | 0 | 0 | 110 | 0 | 0 | 0.067 |
| SVOC | Pentachlorophenol | SO | 135 | mg/kg | <0.04 | <0.22 | n.d. | n.d. | n.d. | n.d. | n.d. | 0 | 0 | 0 | 0 | 4 | 0 | 0 | 1 | 0 | 0 | 0.000057 |
| SVOC | Phenanthrene | SO | 135 | mg/kg | <0.0089 | 440 | 3.98 | n.d. | 37.98 | n.d. | 18.00 | 63 | 47 | - | - | - | - | - | - | - | - | - |

**Table 10. Site-wide Intermediate Depth Soil Analytical Results Statistical Summary**
**Columbia Falls Aluminum Company, LLC, Phase I Site Characterization, 2000 Aluminum Drive, Columbia Falls, MT**

| | | | | | | | | | | | | | | Industrial RSL | | | Residential RSL | | | Risk SSL | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Group | Analyte | Matrix | No. of Results | Unit | Min | Max | Mean | Median | Standard Deviation | 5th Percentile | 95th Percentile | # > LOD | % > LOD | No. Exceeding | % Exceeding | Action Level | No. Exceeding | % Exceeding | Action Level | No. Exceeding | % Exceeding | Action Level |
| SVOC | Phenol | SO | 135 | mg/kg | <0.011 | <0.059 | n.d. | n.d. | n.d. | n.d. | n.d. | 0 | 0 | 0 | 0 | 25000 | 0 | 0 | 1900 | 0 | 0 | 0.33 |
| SVOC | Pyrene | SO | 135 | mg/kg | <0.015 | 730 | 6.23 | n.d. | 62.86 | n.d. | 14.00 | 61 | 45 | 0 | 0 | 2300 | 1 | 1 | 180 | 12 | 9 | 1.3 |
| VOC | 1,1,1-Trichloroethane | SO | 135 | mg/kg | <0.00016 | 0.0004 | n.d. | n.d. | n.d. | n.d. | n.d. | 1 | 1 | 0.00 | 0 | 3600 | 0 | 0 | 810 | 0 | 0 | 0.28 |
| VOC | 1,1,2,2-Tetrachloroethane | SO | 135 | mg/kg | <7.4E-05 | <0.00051 | n.d. | n.d. | n.d. | n.d. | n.d. | 0 | 0 | 0 | 0 | 2.7 | 0 | 0 | 0.6 | 0 | 0 | 0.00003 |
| VOC | 1,1,2-Trichloro-1,2,2-trifluoroethane | SO | 135 | mg/kg | <0.00019 | <0.0013 | n.d. | n.d. | n.d. | n.d. | n.d. | 0 | 0 | 0 | 0 | 17000 | 0 | 0 | 4000 | 0 | 0 | 14 |
| VOC | 1,1,2-Trichloroethane | SO | 135 | mg/kg | <0.00012 | <0.00083 | n.d. | n.d. | n.d. | n.d. | n.d. | 0 | 0 | 0 | 0 | 0.63 | 0 | 0 | 0.15 | 0 | 0 | 0.000013 |
| VOC | 1,1-Dichloroethane | SO | 135 | mg/kg | <0.00015 | <0.001 | n.d. | n.d. | n.d. | n.d. | n.d. | 0 | 0 | 0 | 0 | 16 | 0 | 0 | 3.6 | 0 | 0 | 0.00078 |
| VOC | 1,1-Dichloroethene | SO | 135 | mg/kg | <0.00018 | <0.0012 | n.d. | n.d. | n.d. | n.d. | n.d. | 0 | 0 | 0 | 0 | 100 | 0 | 0 | 23 | 0 | 0 | 0.01 |
| VOC | 1,2,3-Trichlorobenzene | SO | 135 | mg/kg | <4.8E-05 | <0.00033 | n.d. | n.d. | n.d. | n.d. | n.d. | 0 | 0 | 0 | 0 | 93 | 0 | 0 | 6.3 | 0 | 0 | 0.0021 |
| VOC | 1,2,4-Trichlorobenzene | SO | 135 | mg/kg | <0.00014 | <0.00095 | n.d. | n.d. | n.d. | n.d. | n.d. | 0 | 0 | 0 | 0 | 26 | 0 | 0 | 5.8 | 0 | 0 | 0.0012 |
| VOC | 1,2-Dibromo-3-Chloropropane | SO | 135 | mg/kg | <0.0002 | <0.0014 | n.d. | n.d. | n.d. | n.d. | n.d. | 0 | 0 | 0.00 | 0 | 0.064 | 0 | 0 | 0.0053 | 0 | 0 | 0.00000014 |
| VOC | 1,2-Dichlorobenzene | SO | 135 | mg/kg | <6.1E-05 | <0.00042 | n.d. | n.d. | n.d. | n.d. | n.d. | 0 | 0 | 0 | 0 | 930 | 0 | 0 | 180 | 0 | 0 | 0.03 |
| VOC | 1,2-Dichloroethane | SO | 135 | mg/kg | <4.8E-05 | <0.00033 | n.d. | n.d. | n.d. | n.d. | n.d. | 0 | 0 | 0.00 | 0 | 2 | 0 | 0 | 0.46 | 0 | 0 | 0.000048 |
| VOC | 1,2-Dichloropropane | SO | 135 | mg/kg | <7.4E-05 | <0.00051 | n.d. | n.d. | n.d. | n.d. | n.d. | 0 | 0 | 0 | 0 | 4.4 | 0 | 0 | 1 | 0 | 0 | 0.00015 |
| VOC | 1,3-Dichlorobenzene | SO | 135 | mg/kg | <5.2E-05 | <0.00036 | n.d. | n.d. | n.d. | n.d. | n.d. | 0 | 0 | - | - | - | - | - | - | - | - | - |
| VOC | 1,4-Dichlorobenzene | SO | 135 | mg/kg | <5.6E-05 | <0.00039 | n.d. | n.d. | n.d. | n.d. | n.d. | 0 | 0 | 0 | 0 | 11 | 0 | 0 | 2.6 | 0 | 0 | 0.00046 |
| VOC | 2-Butanone (MEK) | SO | 135 | mg/kg | <0.00033 | 0.014 | 0.00 | n.d. | 0.00 | n.d. | 0.01 | 38 | 28 | 0 | 0 | 19000 | 0 | 0 | 2700 | 0 | 0 | 0.12 |
| VOC | 2-Hexanone | SO | 135 | mg/kg | <0.00041 | 0.0011 | n.d. | n.d. | n.d. | n.d. | n.d. | 2 | 1 | 0 | 0 | 130 | 0 | 0 | 20 | 1 | 1 | 0.00088 |
| VOC | 4-Methyl-2-pentanone (MIBK) | SO | 135 | mg/kg | <0.00096 | <0.0066 | n.d. | n.d. | n.d. | n.d. | n.d. | 0 | 0 | 0.00 | 0 | 14000 | 0 | 0 | 3300 | 0 | 0 | 0.14 |
| VOC | Acetone | SO | 135 | mg/kg | <0.00046 | 0.098 | 0.01 | 0.01 | 0.01 | n.d. | 0.04 | 125 | 93 | 0.00 | 0 | 67000 | 0 | 0 | 6100 | 0 | 0 | 0.29 |
| VOC | Benzene | SO | 135 | mg/kg | <8.7E-05 | 0.24 | 0.00 | 0.00 | 0.02 | n.d. | 0.00 | 91 | 67 | 0 | 0 | 5.1 | 0 | 0 | 1.2 | 77 | 57 | 0.00023 |
| VOC | Bromoform | SO | 135 | mg/kg | <5.6E-05 | <0.00039 | n.d. | n.d. | n.d. | n.d. | n.d. | 0 | 0 | 0 | 0 | 86 | 0 | 0 | 19 | 0 | 0 | 0.00087 |
| VOC | Bromomethane | SO | 135 | mg/kg | <0.00014 | 0.00064 | n.d. | n.d. | n.d. | n.d. | n.d. | 2 | 1 | 0 | 0 | 3 | 0 | 0 | 0.68 | 2 | 1 | 0.00019 |
| VOC | Carbon disulfide | SO | 135 | mg/kg | <0.00019 | 0.0047 | 0.00 | n.d. | 0.00 | n.d. | 0.00 | 59 | 44 | 0 | 0 | 350 | 0 | 0 | 77 | 0 | 0 | 0.024 |
| VOC | Carbon tetrachloride | SO | 135 | mg/kg | <0.00019 | <0.0013 | n.d. | n.d. | n.d. | n.d. | n.d. | 0 | 0 | 0 | 0 | 2.9 | 0 | 0 | 0.65 | 0 | 0 | 0.00018 |
| VOC | Chlorobenzene | SO | 135 | mg/kg | <6.1E-05 | 0.0012 | n.d. | n.d. | n.d. | n.d. | n.d. | 1 | 1 | 0 | 0 | 130 | 0 | 0 | 28 | 0 | 0 | 0.0053 |
| VOC | Chlorobromomethane | SO | 135 | mg/kg | <7.4E-05 | <0.00051 | n.d. | n.d. | n.d. | n.d. | n.d. | 0 | 0 | 0 | 0 | 63 | 0 | 0 | 15 | 0 | 0 | 0.0021 |
| VOC | Chlorodibromomethane | SO | 135 | mg/kg | <6.5E-05 | <0.00045 | n.d. | n.d. | n.d. | n.d. | n.d. | 0 | 0 | 0 | 0 | 39 | 0 | 0 | 8.3 | 0 | 0 | 0.00023 |
| VOC | Chloroethane | SO | 135 | mg/kg | <0.00015 | <0.001 | n.d. | n.d. | n.d. | n.d. | n.d. | 0 | 0 | 0 | 0 | 5700 | 0 | 0 | 1400 | 0 | 0 | 0.59 |
| VOC | Chloroform | SO | 135 | mg/kg | <9.1E-05 | <0.00062 | n.d. | n.d. | n.d. | n.d. | n.d. | 0 | 0 | 0.00 | 0 | 1.4 | 0 | 0 | 0.32 | 0 | 0 | 0.000061 |
| VOC | Chloromethane | SO | 135 | mg/kg | <0.00016 | 0.0025 | n.d. | n.d. | n.d. | n.d. | n.d. | 1 | 1 | 0.00 | 0 | 46 | 0 | 0 | 11 | 0 | 0 | 0.0049 |
| VOC | cis-1,2-Dichloroethene | SO | 135 | mg/kg | <9.5E-05 | <0.00065 | n.d. | n.d. | n.d. | n.d. | n.d. | 0 | 0 | 0 | 0 | 230 | 0 | 0 | 16 | 0 | 0 | 0.0011 |
| VOC | cis-1,3-Dichloropropene | SO | 135 | mg/kg | <6.5E-05 | <0.00045 | n.d. | n.d. | n.d. | n.d. | n.d. | 0 | 0 | - | - | - | - | - | - | - | - | - |
| VOC | Cyclohexane | SO | 135 | mg/kg | <0.0002 | 0.64 | 0.01 | n.d. | 0.06 | n.d. | 0.00 | 60 | 44 | 0 | 0 | 2700 | 0 | 0 | 650 | 0 | 0 | 1.3 |
| VOC | Dichlorobromomethane | SO | 135 | mg/kg | <0.00016 | <0.0011 | n.d. | n.d. | n.d. | n.d. | n.d. | 0 | 0 | 0 | 0 | 1.3 | 0 | 0 | 0.29 | 0 | 0 | 0.000036 |
| VOC | Dichlorodifluoromethane | SO | 135 | mg/kg | <0.00014 | <0.00095 | n.d. | n.d. | n.d. | n.d. | n.d. | 0 | 0 | 0 | 0 | 37 | 0 | 0 | 8.7 | 0 | 0 | 0.03 |
| VOC | Ethylbenzene | SO | 135 | mg/kg | <7.8E-05 | 2.4 | 0.02 | n.d. | 0.21 | n.d. | 0.00 | 62 | 46 | 0.00 | 0 | 25 | 0 | 0 | 5.8 | 4 | 3 | 0.0017 |

**Table 10. Site-wide Intermediate Depth Soil Analytical Results Statistical Summary**
**Columbia Falls Aluminum Company, LLC, Phase I Site Characterization, 2000 Aluminum Drive, Columbia Falls, MT**

| Group | Analyte | Matrix | No. of Results | Unit | Min | Max | Mean | Median | Standard Deviation | 5th Percentile | 95th Percentile | # > LOD | % > LOD | Industrial RSL No. Exceeding | Industrial RSL % Exceeding | Industrial RSL Action Level | Residential RSL No. Exceeding | Residential RSL % Exceeding | Residential RSL Action Level | Risk SSL No. Exceeding | Risk SSL % Exceeding | Risk SSL Action Level |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| VOC | Ethylene Dibromide | SO | 135 | mg/kg | <5.2E-05 | <0.00036 | n.d. | n.d. | n.d. | n.d. | n.d. | 0 | 0 | 0 | 0 | 0.16 | 0 | 0 | 0.036 | 0 | 0 | 0.0000021 |
| VOC | Isopropylbenzene | SO | 135 | mg/kg | <7.4E-05 | 0.94 | n.d. | n.d. | n.d. | n.d. | n.d. | 6 | 4 | 0 | 0 | 990 | 0 | 0 | 190 | 1 | 1 | 0.074 |
| VOC | Methyl acetate | SO | 135 | mg/kg | <0.00039 | 0.015 | n.d. | n.d. | n.d. | n.d. | 0.01 | 7 | 5 | 0 | 0 | 120000 | 0 | 0 | 7800 | 0 | 0 | 0.41 |
| VOC | Methyl tert-butyl ether | SO | 135 | mg/kg | <7.4E-05 | <0.00051 | n.d. | n.d. | n.d. | n.d. | n.d. | 0 | 0 | 0 | 0 | 210 | 0 | 0 | 47 | 0 | 0 | 0.0032 |
| VOC | Methylcyclohexane | SO | 135 | mg/kg | <0.00022 | 1.9 | 0.02 | 0.00 | 0.16 | n.d. | 0.01 | 85 | 63 | - | - | - | - | - | - | - | - | - |
| VOC | Methylene Chloride | SO | 135 | mg/kg | <0.00014 | 0.003 | n.d. | n.d. | n.d. | n.d. | 0.00 | 7 | 5 | 0 | 0 | 320 | 0 | 0 | 35 | 1 | 1 | 0.0027 |
| VOC | m-Xylene & p-Xylene | SO | 135 | mg/kg | <4.8E-05 | 5.3 | 0.04 | 0.00 | 0.46 | n.d. | 0.00 | 99 | 73 | 0.00 | 0 | 240 | 0 | 0 | 56 | - | - | - |
| VOC | o-Xylene | SO | 135 | mg/kg | <6.9E-05 | 4.2 | 0.03 | 0.00 | 0.36 | n.d. | 0.00 | 72 | 53 | 0 | 0 | 280 | 0 | 0 | 65 | 1 | 1 | 0.019 |
| VOC | Styrene | SO | 135 | mg/kg | <6.5E-05 | <0.00045 | n.d. | n.d. | n.d. | n.d. | n.d. | 0 | 0 | 0 | 0 | 3500 | 0 | 0 | 600 | 0 | 0 | 0.13 |
| VOC | Tetrachloroethene | SO | 135 | mg/kg | <0.00012 | 0.0011 | n.d. | n.d. | n.d. | n.d. | n.d. | 1 | 1 | 0 | 0 | 39 | 0 | 0 | 8.1 | 0 | 0 | 0.0018 |
| VOC | Toluene | SO | 135 | mg/kg | <8.2E-05 | 2.3 | 0.02 | 0.00 | 0.20 | n.d. | 0.00 | 117 | 87 | 0 | 0 | 4700 | 0 | 0 | 490 | 1 | 1 | 0.076 |
| VOC | trans-1,2-Dichloroethene | SO | 135 | mg/kg | <0.00017 | <0.0012 | n.d. | n.d. | n.d. | n.d. | n.d. | 0 | 0 | 0 | 0 | 2300 | 0 | 0 | 160 | 0 | 0 | 0.011 |
| VOC | trans-1,3-Dichloropropene | SO | 135 | mg/kg | <4.3E-05 | <0.0003 | n.d. | n.d. | n.d. | n.d. | n.d. | 0 | 0 | - | - | - | - | - | - | - | - | - |
| VOC | Trichloroethene | SO | 135 | mg/kg | <0.00011 | <0.00077 | n.d. | n.d. | n.d. | n.d. | n.d. | 0 | 0 | 0 | 0 | 1.9 | 0 | 0 | 0.41 | 0 | 0 | 0.0001 |
| VOC | Trichlorofluoromethane | SO | 135 | mg/kg | <0.00015 | <0.001 | n.d. | n.d. | n.d. | n.d. | n.d. | 0 | 0 | 0 | 0 | 35000 | 0 | 0 | 2300 | 0 | 0 | 0.33 |
| VOC | Vinyl chloride | SO | 135 | mg/kg | <0.00017 | <0.0012 | n.d. | n.d. | n.d. | n.d. | n.d. | 0 | 0 | 0 | 0 | 1.7 | 0 | 0 | 0.059 | 0 | 0 | 0.0000065 |

mg/kg - Milligrams per Kilograms
n.d - Non Detect
LOD - Limit of Detection
Industrial RSL - Environmental Protection Agency Industrial Soil Regional Screening Level
Residential RSL - Environmental Protection Agency Residnetial Soil Regional Screening Level
Risk SSL - Environmental Protection Agency Human Health Protection of Ground Water - Risk-based Soil Screening Level

**Table 11. Lead in Bulk and Sieved Soil Summary**
**Columbia Falls Aluminum Company, LLC, Phase I Site Characterization, 2000 Aluminum Drive, Columbia Falls, MT**

| | | | | | Sample Location: | CFISS-004 | CFISS-004 | CFISS-011 | CFISS-011 | CFISS-013 | CFISS-013 | CFISS-021 | CFISS-021 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | Sample Date: | 6/15/2016 | 6/15/2016 | 6/21/2016 | 6/21/2016 | 6/20/2016 | 6/20/2016 | 6/25/2016 | 6/25/2016 |
| | | | | | Sample Depth (ft-bls): | 0 - 0.5 | 0 - 0.5 | 0 - 0.5 | 0 - 0.5 | 0 - 0.5 | 0 - 0.5 | 0 - 0.5 | 0 - 0.5 |
| | | | | | Sample Designation: | CFISS-004-SO-0-0.5 | CFISS-004-SO-0-0.5-Pb | CFISS-011-SO-0-0.5 | CFISS-011-SO-0-0.5-Pb | CFISS-013-SO-0-0.5 | CFISS-013-SO-0-0.5-Pb | CFISS-021-SO-0-0.5 | CFISS-021-SO-0-0.5Pb |
| | | | | | Sample Type: | Bulk | Sieved | Bulk | Sieved | Bulk | Sieved | Bulk | Sieved |
| Parameter | EPA Residential Soil RSL | EPA Industrial Soil RSL | EPA Protection of Groundwater Risk-Based Soil RSL | Factor | Units | | | | | | | | |
| Lead | 400 | 800 | -- | | mg/kg | 15.9 J+ | 20.1 | 13.6 J | 17.2 | 17.7 J | 29.4 | 46.5 J | 55.1 |
| Ratio of Sieved Lead to Bulk Lead | -- | -- | -- | -- | -- | 1.3 | | 1.3 | | 1.7 | | 1.2 | |
| Factor Applied to Bulk Concentration | 400 | 800 | -- | 2.2 | mg/kg | 35.0 | | 29.9 | | 38.9 | | 102.3 | |

J - Estimated Value
J+ - Estimated High Bias
J- - Estimated Low Bias
mg/kg - Milligrams per Kilograms
ft-bls - Feet Below Land Surface
Industiral RSL - Environmental Protection Agency Industrial Soil Regional Screening Level
Residential RSL - Environmental Protection Agency Residnetial Soil Regional Screening Level
Risk SSL - Environmental Protection Agency Human Health Protection of Ground Water - Risk-based Soil Screening Level

**Table 11. Lead in Bulk and Sieved Soil Summary**
**Columbia Falls Aluminum Company, LLC, Phase I Site Characterization, 2000 Aluminum Drive, Columbia Falls, MT**

| | | | | | Sample Location: | CFISS-024 | CFISS-024 | CFISS-028 | CFISS-028 | CFISS-032 | CFISS-032 | CFISS-037 | CFISS-037 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | Sample Date: | 6/29/2016 | 6/29/2016 | 7/1/2016 | 7/1/2016 | 7/12/2016 | 7/12/2016 | 7/15/2016 | 7/15/2016 |
| | | | | | Sample Depth (ft-bls): | 0 - 0.5 | 0 - 0.5 | 0 - 0.5 | 0 - 0.5 | 0 - 0.5 | 0 - 0.5 | 0 - 0.5 | 0 - 0.5 |
| | | | | | Sample Designation: | CFISS-024-SO-0-0.5 | CFISS-024-SO-0-0.5Pb | CFISS-028-SO-0-0.5 | CFISS-028-SO-0-0.5Pb | CFISS-032-SO-0-0.5 | CFISS-032-SO-0-0.5Pb | CFISS-037-SO-0-0.5 | CFISS-037-SO-0-0.5Pb |
| | | | | | Sample Type: | Bulk | Sieved | Bulk | Sieved | Bulk | Sieved | Bulk | Sieved |
| Parameter | EPA Residential Soil RSL | EPA Industrial Soil RSL | EPA Protection of Groundwater Risk-Based Soil RSL | Factor | Units | | | | | | | | |
| Lead | 400 | 800 | -- | | mg/kg | 18.1 | 24.5 | 16.6 | 14.1 | 19.2 | 15.8 J | 88.3 | 68 J |
| Ratio of Sieved Lead to Bulk Lead | -- | -- | -- | -- | -- | 1.4 | | 0.8 | | 0.8 | | 0.8 | |
| Factor Applied to Bulk Concentration | 400 | 800 | -- | 2.2 | mg/kg | 39.8 | | 36.5 | | 42.2 | | 194.3 | |

J - Estimated Value
J+ - Estimated High Bias
J- - Estimated Low Bias
mg/kg - Milligrams per Kilograms
ft-bls - Feet Below Land Surface
Industiral RSL - Environmental Protection Agency Industrial Soil Regional Screening Level
Residential RSL - Environmental Protection Agency Residnetial Soil Regional Screening Level
Risk SSL - Environmental Protection Agency Human Health Protection of Ground Water - Risk-based Soil Screening L

**Table 11. Lead in Bulk and Sieved Soil Summary**
**Columbia Falls Aluminum Company, LLC, Phase I Site Characterization, 2000 Aluminum Drive, Columbia Falls, MT**

| | | | | | Sample Location: | CFISS-040 | CFISS-040 | CFMW-008a | CFMW-008a | CFMW-010 | CFMW-010 | CFMW-011a | CFMW-011a |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | Sample Date: | 7/13/2016 | 7/13/2016 | 6/13/2016 | 6/13/2016 | 5/18/2016 | 5/18/2016 | 6/25/2016 | 6/25/2016 |
| | | | | | Sample Depth (ft-bls): | 0 - 0.5 | 0 - 0.5 | 0 - 0.5 | 0 - 0.5 | 0 - 0.5 | 0 - 0.5 | 0 - 0.5 | 0 - 0.5 |
| | | | | | Sample Designation: | CFISS-040-S0-0-0.5 | CFISS-040-S0-0-0.5Pb | CFMW-008a-SO-0-0.5 | CFMW-008a-SO-0-0.5-Pb | CFMW-010-SO-0-0.5 | CFMW-010-SO-0-0.5-Pb | CFMW-011a-SO-0-0.5 | CFMW-011a-SO-0-0.5pb |
| | | | | | Sample Type: | Bulk | Sieved | Bulk | Sieved | Bulk | Sieved | Bulk | Sieved |
| Parameter | EPA Residential Soil RSL | EPA Industrial Soil RSL | EPA Protection of Groundwater Risk-Based Soil RSL | Factor | Units | | | | | | | | |
| Lead | 400 | 800 | -- | | mg/kg | 45.4 | 33.4 J | 23.3 J+ | 21.9 | 13.5 | 45.8 | 11.2 | 7.9 |
| Ratio of Sieved Lead to Bulk Lead | -- | -- | -- | -- | -- | 0.7 | | 0.9 | | 3.4 | | 0.7 | |
| Factor Applied to Bulk Concentration | 400 | 800 | -- | 2.2 | mg/kg | 99.9 | | 51.3 | | 29.7 | | 24.6 | |

J - Estimated Value
J+ - Estimated High Bias
J- - Estimated Low Bias
mg/kg - Milligrams per Kilograms
ft-bls - Feet Below Land Surface
Industiral RSL - Environmental Protection Agency Industrial Soil Regional Screening Level
Residential RSL - Environmental Protection Agency Residnetial Soil Regional Screening Level
Risk SSL - Environmental Protection Agency Human Health Protection of Ground Water - Risk-based Soil Screening L

**Table 11. Lead in Bulk and Sieved Soil Summary**
**Columbia Falls Aluminum Company, LLC, Phase I Site Characterization, 2000 Aluminum Drive, Columbia Falls, MT**

| | | | | | Sample Location: | CFMW-012a | CFMW-012a | CFMW-016a | CFMW-016a | CFMW-018 | CFMW-018 | CFMW-022 | CFMW-022 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | Sample Date: | 5/20/2016 | 5/20/2016 | 6/21/2016 | 6/21/2016 | 5/19/2016 | 5/19/2016 | 6/2/2016 | 6/2/2016 |
| | | | | | Sample Depth (ft-bls): | 0 - 0.5 | 0 - 0.5 | 0 - 0.5 | 0 - 0.5 | 0 - 0.5 | 0 - 0.5 | 0 - 0.5 | 0 - 0.5 |
| | | | | | Sample Designation: | CFMW-012A-SO-0-0.5 | CFMW-012A-SO-0-0.5-Pb | CFMW-016a-SO-0-0.5 | CFMW-016a-SO-0-0.5-Pb | CFMW-018-SO-0-0.5 | CFMW-018-SO-0-0.5-Pb | CFMW-022-SO-0-0.5 | CFMW-022-SO-0-0.5-Pb |
| | | | | | Sample Type: | Bulk | Sieved | Bulk | Sieved | Bulk | Sieved | Bulk | Sieved |
| Parameter | EPA Residential Soil RSL | EPA Industrial Soil RSL | EPA Protection of Groundwater Risk-Based Soil RSL | Factor | Units | | | | | | | | |
| Lead | 400 | 800 | -- | | mg/kg | 15 J | 15 | 23.3 J | 20.6 | 12.4 | 9.7 | 9.1 | 21.6 |
| Ratio of Sieved Lead to Bulk Lead | -- | -- | -- | -- | -- | 1.0 | | 0.9 | | 0.8 | | 2.4 | |
| Factor Applied to Bulk Concentration | 400 | 800 | -- | 2.2 | mg/kg | 33.0 | | 51.3 | | 27.3 | | 20.0 | |

J - Estimated Value
J+ - Estimated High Bias
J- - Estimated Low Bias
mg/kg - Milligrams per Kilograms
ft-bls - Feet Below Land Surface
Industiral RSL - Environmental Protection Agency Industrial Soil Regional Screening Level
Residential RSL - Environmental Protection Agency Residnetial Soil Regional Screening Level
Risk SSL - Environmental Protection Agency Human Health Protection of Ground Water - Risk-based Soil Screening L

**Table 11. Lead in Bulk and Sieved Soil Summary**
**Columbia Falls Aluminum Company, LLC, Phase I Site Characterization, 2000 Aluminum Drive, Columbia Falls, MT**

| | | | | | Sample Location: | CFMW-023a | CFMW-023a | CFMW-025a | CFMW-025a | CFMW-026 | CFMW-026 | CFMW-027 | CFMW-027 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | Sample Date: | 6/17/2016 | 6/17/2016 | 7/13/2016 | 7/13/2016 | 6/14/2016 | 6/14/2016 | 6/30/2016 | 6/30/2016 |
| | | | | | Sample Depth (ft-bls): | 0 - 0.5 | 0 - 0.5 | 0 - 0.5 | 0 - 0.5 | 0 - 0.5 | 0 - 0.5 | 0 - 0.5 | 0 - 0.5 |
| | | | | | Sample Designation: | CFMW-023a-SO-0-0.5 | CFMW-023a-SO-0-0.5-Pb | CFMW-025a-SO-0-0.5 | CFMW-025a-SO-0-0.5Pb | CFMW-026-SO-0-0.5 | CFMW-026-SO-0-0.5-Pb | CFMW-027-SO-0-0.5 | CFMW-027-SO-0-0.5Pb |
| | | | | | Sample Type: | Bulk | Sieved | Bulk | Sieved | Bulk | Sieved | Bulk | Sieved |
| Parameter | EPA Residential Soil RSL | EPA Industrial Soil RSL | EPA Protection of Groundwater Risk-Based Soil RSL | Factor | Units | | | | | | | | |
| Lead | 400 | 800 | -- | | mg/kg | 13.4 | 12 | 18.5 | 20.3 | 44.8 J+ | 37.8 | 30.3 | 35.2 |
| Ratio of Sieved Lead to Bulk Lead | -- | -- | -- | -- | -- | 0.9 | | 1.1 | | 0.8 | | 1.2 | |
| Factor Applied to Bulk Concentration | 400 | 800 | -- | 2.2 | mg/kg | 29.5 | | 40.7 | | 98.6 | | 66.7 | |

J - Estimated Value
J+ - Estimated High Bias
J- - Estimated Low Bias
mg/kg - Milligrams per Kilograms
ft-bls - Feet Below Land Surface
Industiral RSL - Environmental Protection Agency Industrial Soil Regional Screening Level
Residential RSL - Environmental Protection Agency Residnetial Soil Regional Screening Level
Risk SSL - Environmental Protection Agency Human Health Protection of Ground Water - Risk-based Soil Screening L

**Table 11. Lead in Bulk and Sieved Soil Summary**
**Columbia Falls Aluminum Company, LLC, Phase I Site Characterization, 2000 Aluminum Drive, Columbia Falls, MT**

| | | | | | Sample Location: | CFMW-028a | CFMW-028a | CFMW-032a | CFMW-032a | CFMW-033 | CFMW-033 | CFMW-038 | CFMW-038 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | Sample Date: | 6/30/2016 | 6/30/2016 | 8/8/2016 | 8/8/2016 | 7/1/2016 | 7/1/2016 | 6/25/2016 | 6/25/2016 |
| | | | | | Sample Depth (ft-bls): | 0 - 0.5 | 0 - 0.5 | 0 - 0.5 | 0 - 0.5 | 0 - 0.5 | 0 - 0.5 | 0 - 0.5 | 0 - 0.5 |
| | | | | | Sample Designation: | CFMW-028a-SO-0-0.5 | CFMW-028a-SO-0-0.5Pb | CFMW-032a-SO-0-0.5 | CFMW-032a-SO-0-0.5Pb | CFMW-033-SO-0-0.5 | CFMW-033-SO-0-0.5Pb | CFMW-038-SO-0-0.5 Pb | CFMW-038-SO-0-0.5 |
| | | | | | Sample Type: | Bulk | Sieved | Bulk | Sieved | Bulk | Sieved | Bulk | Sieved |
| Parameter | EPA Residential Soil RSL | EPA Industrial Soil RSL | EPA Protection of Groundwater Risk-Based Soil RSL | Factor | Units | | | | | | | | |
| Lead | 400 | 800 | -- | | mg/kg | 9.7 | 10.9 | 13.7 | 13.3 | 9.2 | 47.3 | 12.4 | 8.2 |
| Ratio of Sieved Lead to Bulk Lead | -- | -- | -- | -- | -- | 1.1 | | 1.0 | | 5.1 | | 1.5 | |
| Factor Applied to Bulk Concentration | 400 | 800 | -- | 2.2 | mg/kg | 21.3 | | 30.1 | | 20.2 | | 27.3 | |

J - Estimated Value
J+ - Estimated High Bias
J- - Estimated Low Bias
mg/kg - Milligrams per Kilograms
ft-bls - Feet Below Land Surface
Industiral RSL - Environmental Protection Agency Industrial Soil Regional Screening Level
Residential RSL - Environmental Protection Agency Residnetial Soil Regional Screening Level
Risk SSL - Environmental Protection Agency Human Health Protection of Ground Water - Risk-based Soil Screening L

**Table 11. Lead in Bulk and Sieved Soil Summary**
**Columbia Falls Aluminum Company, LLC, Phase I Site Characterization, 2000 Aluminum Drive, Columbia Falls, MT**

| | | | | | Sample Location: | CFMW-040 | CFMW-040 | CFMW-042 | CFMW-042 | CFMW-043 | CFMW-043 | CFMW-044a | CFMW-044a |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | Sample Date: | 6/28/2016 | 6/28/2016 | 6/16/2016 | 6/16/2016 | 6/15/2016 | 6/15/2016 | 7/20/2016 | 7/20/2016 |
| | | | | | Sample Depth (ft-bls): | 0 - 0.5 | 0 - 0.5 | 0 - 0.5 | 0 - 0.5 | 0 - 0.5 | 0 - 0.5 | 0 - 0.5 | 0 - 0.5 |
| | | | | | Sample Designation: | CFMW-040-SO-0-0.5 | CFMW-040-SO-0-0.5Pb | CFMW-042-SO-0-0.5 | CFMW-042-SO-0-0.5-Pb | CFMW-043-SO-0-0.5 | CFMW-043-SO-0-0.5-Pb | CFMW-044a-SO-0-0.5 | CFMW-044a-SO-0-0.5Pb |
| | | | | | Sample Type: | Bulk | Sieved | Bulk | Sieved | Bulk | Sieved | Bulk | Sieved |
| Parameter | EPA Residential Soil RSL | EPA Industrial Soil RSL | EPA Protection of Groundwater Risk-Based Soil RSL | Factor | Units | | | | | | | | |
| Lead | 400 | 800 | -- | | mg/kg | 57.7 J- | 184 | 28.2 J+ | 20.7 | 23.2 J+ | 23.7 | 10.5 J | 13.8 |
| Ratio of Sieved Lead to Bulk Lead | -- | -- | -- | -- | -- | 3.2 | | 0.7 | | 1.0 | | 1.3 | |
| Factor Applied to Bulk Concentration | 400 | 800 | -- | 2.2 | mg/kg | 126.9 | | 62.0 | | 51.0 | | 23.1 | |

J - Estimated Value
J+ - Estimated High Bias
J- - Estimated Low Bias
mg/kg - Milligrams per Kilograms
ft-bls - Feet Below Land Surface
Industiral RSL - Environmental Protection Agency Industrial Soil Regional Screening Level
Residential RSL - Environmental Protection Agency Residnetial Soil Regional Screening Level
Risk SSL - Environmental Protection Agency Human Health Protection of Ground Water - Risk-based Soil Screening L

**Table 11. Lead in Bulk and Sieved Soil Summary**
**Columbia Falls Aluminum Company, LLC, Phase I Site Characterization, 2000 Aluminum Drive, Columbia Falls, MT**

| | | | | | Sample Location: | CFMW-047 | CFMW-047 | CFMW-049a | CFMW-049a | CFMW-050 | CFMW-050 | CFMW-053a | CFMW-053a |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | Sample Date: | 6/21/2016 | 6/21/2016 | 8/20/2016 | 8/20/2016 | 6/22/2016 | 6/22/2016 | 8/17/2016 | 8/17/2016 |
| | | | | | Sample Depth (ft-bls): | 0 - 0.5 | 0 - 0.5 | 0 - 0.5 | 0.5 - 2 | 0 - 0.5 | 0 - 0.5 | 0 - 0.5 | 0 - 0.5 |
| | | | | | Sample Designation: | CFMW-047-SO-0-0.5 | CFMW-047-SO-0-0.5-Pb | CFMW-049a-SO-0-0.5 Pb | CFMW-049a-SO-0.5-2 | CFMW-050-SO-0-0.5 | CFMW-050-SO-0-0.5-Pb | CFMW-053a-SO-0-0.5 | CFMW-053a-SO-0-0.5Pb |
| | | | | | Sample Type: | Bulk | Sieved | Bulk | Sieved | Bulk | Sieved | Bulk | Sieved |
| Parameter | EPA Residential Soil RSL | EPA Industrial Soil RSL | EPA Protection of Groundwater Risk-Based Soil RSL | Factor | Units | | | | | | | | |
| Lead | 400 | 800 | -- | | mg/kg | 11.6 J | 13.2 | 19.4 | 4.4 J | 31.7 | 23.7 | 12.2 J+ | 17.2 |
| Ratio of Sieved Lead to Bulk Lead | -- | -- | -- | -- | -- | 1.1 | | 4.4 | | 0.7 | | 1.4 | |
| Factor Applied to Bulk Concentration | 400 | 800 | -- | 2.2 | mg/kg | 25.5 | | 42.7 | | 69.7 | | 26.8 | |

J - Estimated Value
J+ - Estimated High Bias
J- - Estimated Low Bias
mg/kg - Milligrams per Kilograms
ft-bls - Feet Below Land Surface
Industiral RSL - Environmental Protection Agency Industrial Soil Regional Screening Level
Residential RSL - Environmental Protection Agency Residnetial Soil Regional Screening Level
Risk SSL - Environmental Protection Agency Human Health Protection of Ground Water - Risk-based Soil Screening L

**Table 11. Lead in Bulk and Sieved Soil Summary**
**Columbia Falls Aluminum Company, LLC, Phase I Site Characterization, 2000 Aluminum Drive, Columbia Falls, MT**

| | | | | | Sample Location: | CFMW-056a | CFMW-056a | CFMW-059a | CFMW-059a | CFMW-061 | CFMW-061 | CFMW-064 | CFMW-064 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | Sample Date: | 7/15/2016 | 7/15/2016 | 7/22/2016 | 7/22/2016 | 7/12/2016 | 7/12/2016 | 7/11/2016 | 7/11/2016 |
| | | | | | Sample Depth (ft-bls): | 0 - 0.5 | 0 - 0.5 | 0 - 0.5 | 0 - 0.5 | 0 - 0.5 | 0 - 0.5 | 0 - 0.5 | 0 - 0.5 |
| | | | | | Sample Designation: | CFMW-056a-SO-0-0.5 | CFMW-056a-SO-0-0.5Pb | CFMW-059a-SO-0-0.5 | CFMW-059a-SO-0-0.5Pb | CFMW-061-SO-0-0.5 | CFMW-061-SO-0-0.5Pb | CFMW-064-SO-0-0.5 | CFMW-064-SO-0-0.5Pb |
| | | | | | Sample Type: | Bulk | Sieved | Bulk | Sieved | Bulk | Sieved | Bulk | Sieved |
| Parameter | EPA Residential Soil RSL | EPA Industrial Soil RSL | EPA Protection of Groundwater Risk-Based Soil RSL | Factor | Units | | | | | | | | |
| Lead | 400 | 800 | -- | | mg/kg | 13.1 | 13.6 | 9.3 J+ | 11.7 | 8.9 | 15.2 | 12.4 | 10.4 |
| Ratio of Sieved Lead to Bulk Lead | -- | -- | -- | -- | -- | 1.0 | | 1.3 | | 1.7 | | 0.8 | |
| Factor Applied to Bulk Concentration | 400 | 800 | -- | 2.2 | mg/kg | 28.8 | | 20.5 | | 19.6 | | 27.3 | |

J - Estimated Value
J+ - Estimated High Bias
J- - Estimated Low Bias
mg/kg - Milligrams per Kilograms
ft-bls - Feet Below Land Surface
Industiral RSL - Environmental Protection Agency Industrial Soil Regional Screening Level
Residential RSL - Environmental Protection Agency Residnetial Soil Regional Screening Level
Risk SSL - Environmental Protection Agency Human Health Protection of Ground Water - Risk-based Soil Screening L

**Table 12. Operation Area Surface Soil Analytical Results Statistical Summary**
**Columbia Falls Aluminum Company, LLC, Phase I Site Characterization, 2000 Aluminum Drive, Columbia Falls, MT**

| Group | Analyte | Matrix | No. of Results | Unit | Min | Max | Mean | Median | Standard Deviation | 5th Percentile | 95th Percentile | # > LOD | % > LOD | Industrial RSL | | | Residential RSL | | | Risk SSL | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | | | | | | | No. Exceeding | % Exceeding | Action Level | No. Exceeding | % Exceeding | Action Level | No. Exceeding | % Exceeding | Action Level |
| GENCHEM | Fluoride | SO | 43 | mg/kg | 10.40 | 976.00 | 254.93 | 183.00 | 249.60 | 28.22 | 678.20 | 43 | 100 | 0 | 0 | 4700 | 14 | 33 | 310 | 42 | 98 | 12 |
| METALS | Aluminum | SO | 43 | mg/kg | 9720.00 | 37700.00 | 21598.14 | 20100.00 | 7391.27 | 11540.00 | 35850.00 | 43 | 100 | 0 | 0 | 110000 | 43 | 100 | 7700 | 43 | 100 | 3000 |
| METALS | Antimony | SO | 43 | mg/kg | <0.33 | 8.60 | 0.68 | 0.23 | 1.52 | n.d. | 3.96 | 32 | 74 | 0 | 0 | 47 | 3 | 7 | 3.1 | 32 | 74 | 0.035 |
| METALS | Arsenic | SO | 43 | mg/kg | 4.20 | 31.30 | 7.02 | 5.70 | 4.77 | 4.41 | 14.64 | 43 | 100 | 43 | 100 | 3 | 43 | 100 | 0.68 | 43 | 100 | 0.0015 |
| METALS | Barium | SO | 43 | mg/kg | 59.40 | 293.00 | 146.98 | 120.00 | 63.12 | 75.21 | 262.00 | 43 | 100 | 0 | 0 | 22000 | 0 | 0 | 1500 | 43 | 100 | 16 |
| METALS | Beryllium | SO | 43 | mg/kg | 0.40 | 3.70 | 0.87 | 0.80 | 0.54 | 0.47 | 1.49 | 43 | 100 | 0 | 0 | 230 | 0 | 0 | 16 | 1 | 2 | 1.9 |
| METALS | Cadmium | SO | 43 | mg/kg | <0.25 | 1.60 | 0.34 | 0.26 | 0.35 | n.d. | 1.07 | 32 | 74 | 0 | 0 | 98 | 0 | 0 | 7.1 | 32 | 74 | 0.069 |
| METALS | Calcium | SO | 43 | mg/kg | 4160.00 | 45700.00 | 20024.42 | 18300.00 | 9345.28 | 7107.00 | 33400.00 | 43 | 100 | - | - | - | - | - | - | - | - | - |
| METALS | Chromium | SO | 43 | mg/kg | 10.10 | 50.40 | 20.24 | 17.90 | 9.01 | 10.61 | 36.71 | 43 | 100 | - | - | - | - | - | - | - | - | - |
| METALS | Cobalt | SO | 43 | mg/kg | 4.70 | 13.50 | 6.55 | 6.30 | 1.54 | 5.20 | 9.19 | 43 | 100 | 0 | 0 | 35 | 43 | 100 | 2.3 | 43 | 100 | 0.027 |
| METALS | Copper | SO | 43 | mg/kg | 10.40 | 887.00 | 67.45 | 23.30 | 153.46 | 12.17 | 320.90 | 43 | 100 | 0 | 0 | 4700 | 3 | 7 | 310 | 43 | 100 | 2.8 |
| METALS | Cyanide, Total | SO | 43 | mg/kg | 0.02 | 19.80 | 1.43 | 0.28 | 4.14 | 0.04 | 7.88 | 43 | 100 | 2.00 | 5 | 15 | 3 | 7 | 2.3 | 43 | 100 | 0.0015 |
| METALS | Iron | SO | 43 | mg/kg | 13300.00 | 66700.00 | 19802.33 | 17200.00 | 9030.86 | 14520.00 | 30390.00 | 43 | 100 | 0.00 | 0 | 82000 | 43 | 100 | 5500 | 43 | 100 | 35 |
| METALS | Lead | SO | 52 | mg/kg | 11.70 | 406.00 | 38.54 | 19.45 | 58.01 | 12.06 | 86.27 | 52 | 100 | 0 | 0 | 800 | 1 | 2 | 400 | - | - | - |
| METALS | Magnesium | SO | 43 | mg/kg | 7240.00 | 11800.00 | 10216.05 | 10500.00 | 1175.70 | 8147.00 | 11600.00 | 43 | 100 | - | - | - | - | - | - | - | - | - |
| METALS | Manganese | SO | 43 | mg/kg | 341.00 | 731.00 | 471.72 | 460.00 | 86.23 | 358.50 | 630.30 | 43 | 100 | 0 | 0 | 2600 | 43 | 100 | 180 | 43 | 100 | 2.8 |
| METALS | Mercury | SO | 43 | mg/kg | <0.013 | 0.06 | 0.02 | 0.02 | 0.01 | n.d. | 0.05 | 29 | 67 | 0.00 | 0 | 4.6 | 0 | 0 | 1.1 | 29 | 67 | 0.0033 |
| METALS | Nickel | SO | 43 | mg/kg | 13.40 | 142.00 | 36.60 | 29.40 | 23.91 | 15.72 | 76.48 | 43 | 100 | 0 | 0 | 2200 | 0 | 0 | 150 | 43 | 100 | 2.6 |
| METALS | Potassium | SO | 43 | mg/kg | 781.00 | 3080.00 | 1479.33 | 1400.00 | 521.53 | 847.90 | 2362.00 | 43 | 100 | - | - | - | - | - | - | - | - | - |
| METALS | Selenium | SO | 43 | mg/kg | <0.31 | 13.30 | 1.55 | 1.10 | 2.16 | n.d. | 4.56 | 33 | 77 | 0 | 0 | 580 | 0 | 0 | 39 | 33 | 77 | 0.052 |
| METALS | Silver | SO | 43 | mg/kg | <0.61 | 1.30 | 0.15 | 0.06 | 0.29 | n.d. | 0.89 | 31 | 72 | 0 | 0 | 580 | 0 | 0 | 39 | 14 | 33 | 0.08 |
| METALS | Sodium | SO | 43 | mg/kg | <41.1 | 9000.00 | 1141.59 | 357.00 | 1682.70 | n.d. | 3855.00 | 40 | 93 | - | - | - | - | - | - | - | - | - |
| METALS | Thallium | SO | 43 | mg/kg | <0.13 | 0.40 | 0.10 | 0.10 | 0.08 | n.d. | 0.22 | 31 | 72 | 0 | 0 | 1.2 | 31 | 72 | 0.078 | 31 | 72 | 0.0014 |
| METALS | Vanadium | SO | 43 | mg/kg | 10.40 | 54.50 | 20.64 | 18.00 | 9.39 | 12.36 | 38.32 | 43 | 100 | 0 | 0 | 580 | 2 | 5 | 39 | 43 | 100 | 8.6 |
| METALS | Zinc | SO | 43 | mg/kg | 47.40 | 1720.00 | 150.02 | 70.30 | 294.71 | 48.35 | 704.30 | 43 | 100 | 0.00 | 0 | 35000 | 0 | 0 | 2300 | 43 | 100 | 37 |
| OC_PEST | 4,4'-DDD | SO | 43 | mg/kg | <0.00085 | <0.001 | n.d. | n.d. | n.d. | n.d. | n.d. | 0 | 0 | 0.00 | 0 | 9.6 | 0 | 0 | 2.3 | 0 | 0 | 0.0075 |
| OC_PEST | 4,4'-DDE | SO | 43 | mg/kg | <0.00093 | <0.0011 | n.d. | n.d. | n.d. | n.d. | n.d. | 0 | 0 | 0.00 | 0 | 9.3 | 0 | 0 | 2 | 0 | 0 | 0.011 |
| OC_PEST | 4,4'-DDT | SO | 43 | mg/kg | <0.00066 | <0.00079 | n.d. | n.d. | n.d. | n.d. | n.d. | 0 | 0 | 0 | 0 | 8.5 | 0 | 0 | 1.9 | 0 | 0 | 0.077 |
| OC_PEST | Aldrin | SO | 43 | mg/kg | <0.00078 | <0.00093 | n.d. | n.d. | n.d. | n.d. | n.d. | 0 | 0 | 0 | 0 | 0.18 | 0 | 0 | 0.039 | 0 | 0 | 0.00015 |
| OC_PEST | alpha-BHC | SO | 43 | mg/kg | <0.00059 | <0.0007 | n.d. | n.d. | n.d. | n.d. | n.d. | 0 | 0 | 0 | 0 | 0.36 | 0 | 0 | 0.086 | 0 | 0 | 4.2E-05 |
| OC_PEST | alpha-Chlordane | SO | 43 | mg/kg | <0.001 | <0.0013 | n.d. | n.d. | n.d. | n.d. | n.d. | 0 | 0 | - | - | - | - | - | - | - | - | - |
| OC_PEST | beta-BHC | SO | 43 | mg/kg | <0.00063 | <0.00075 | n.d. | n.d. | n.d. | n.d. | n.d. | 0 | 0 | 0 | 0 | 1.3 | 0 | 0 | 0.3 | 0 | 0 | 0.00015 |
| OC_PEST | delta-BHC | SO | 43 | mg/kg | <0.0007 | <0.00084 | n.d. | n.d. | n.d. | n.d. | n.d. | 0 | 0 | - | - | - | - | - | - | - | - | - |
| OC_PEST | Dieldrin | SO | 43 | mg/kg | <0.00084 | <0.001 | n.d. | n.d. | n.d. | n.d. | n.d. | 0 | 0 | 0 | 0 | 0.14 | 0 | 0 | 0.034 | 0 | 0 | 7.1E-05 |
| OC_PEST | Endosulfan I | SO | 43 | mg/kg | <0.00089 | <0.0011 | n.d. | n.d. | n.d. | n.d. | n.d. | 0 | 0 | - | - | - | - | - | - | - | - | - |
| OC_PEST | Endosulfan II | SO | 43 | mg/kg | <0.001 | <0.0012 | n.d. | n.d. | n.d. | n.d. | n.d. | 0 | 0 | - | - | - | - | - | - | - | - | - |

**Table 12. Operation Area Surface Soil Analytical Results Statistical Summary**
**Columbia Falls Aluminum Company, LLC, Phase I Site Characterization, 2000 Aluminum Drive, Columbia Falls, MT**

| Group | Analyte | Matrix | No. of Results | Unit | Min | Max | Mean | Median | Standard Deviation | 5th Percentile | 95th Percentile | # > LOD | % > LOD | Industrial RSL | | | Residential RSL | | | Risk SSL | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | | | | | | | No. Exceeding | % Exceeding | Action Level | No. Exceeding | % Exceeding | Action Level | No. Exceeding | % Exceeding | Action Level |
| OC_PEST | Endosulfan sulfate | SO | 43 | mg/kg | <0.00075 | <0.0009 | n.d. | n.d. | n.d. | n.d. | n.d. | 0 | 0 | - | - | - | - | - | - | - | - | - |
| OC_PEST | Endrin | SO | 43 | mg/kg | <0.00082 | <0.00098 | n.d. | n.d. | n.d. | n.d. | n.d. | 0 | 0 | 0 | 0 | 25 | 0 | 0 | 1.9 | 0 | 0 | 0.0092 |
| OC_PEST | Endrin aldehyde | SO | 43 | mg/kg | <0.0008 | <0.00095 | n.d. | n.d. | n.d. | n.d. | n.d. | 0 | 0 | - | - | - | - | - | - | - | - | - |
| OC_PEST | Endrin ketone | SO | 43 | mg/kg | <0.00089 | <0.0011 | n.d. | n.d. | n.d. | n.d. | n.d. | 0 | 0 | - | - | - | - | - | - | - | - | - |
| OC_PEST | gamma-BHC (Lindane) | SO | 43 | mg/kg | <0.00058 | <0.00069 | n.d. | n.d. | n.d. | n.d. | n.d. | 0 | 0 | 0 | 0 | 2.5 | 0 | 0 | 0.57 | 0 | 0 | 0.00024 |
| OC_PEST | gamma-Chlordane | SO | 43 | mg/kg | <0.0014 | <0.0017 | n.d. | n.d. | n.d. | n.d. | n.d. | 0 | 0 | - | - | - | - | - | - | - | - | - |
| OC_PEST | Heptachlor | SO | 43 | mg/kg | <0.00083 | <0.00099 | n.d. | n.d. | n.d. | n.d. | n.d. | 0 | 0 | 0 | 0 | 0.63 | 0 | 0 | 0.13 | 0 | 0 | 0.00012 |
| OC_PEST | Heptachlor epoxide | SO | 43 | mg/kg | <0.0013 | <0.0015 | n.d. | n.d. | n.d. | n.d. | n.d. | 0 | 0 | 0 | 0 | 0.33 | 0 | 0 | 0.07 | 0 | 0 | 2.8E-05 |
| OC_PEST | Methoxychlor | SO | 43 | mg/kg | <0.0014 | <0.0016 | n.d. | n.d. | n.d. | n.d. | n.d. | 0 | 0 | 0 | 0 | 410 | 0 | 0 | 32 | 0 | 0 | 0.2 |
| OC_PEST | Toxaphene | SO | 43 | mg/kg | <0.019 | <0.022 | n.d. | n.d. | n.d. | n.d. | n.d. | 0 | 0 | 0 | 0 | 2.1 | 0 | 0 | 0.49 | 0 | 0 | 0.011 |
| PCB | Aroclor 1016 | SO | 43 | mg/kg | <0.0086 | <0.01 | n.d. | n.d. | n.d. | n.d. | n.d. | 0 | 0 | 0 | 0 | 5.1 | 0 | 0 | 0.41 | 0 | 0 | 0.013 |
| PCB | Aroclor 1221 | SO | 43 | mg/kg | <0.0086 | <0.01 | n.d. | n.d. | n.d. | n.d. | n.d. | 0 | 0 | 0 | 0 | 0.83 | 0 | 0 | 0.2 | 0 | 0 | 0.00008 |
| PCB | Aroclor 1232 | SO | 43 | mg/kg | <0.0086 | <0.01 | n.d. | n.d. | n.d. | n.d. | n.d. | 0 | 0 | 0.00 | 0 | 0.72 | 0 | 0 | 0.17 | 0 | 0 | 0.00008 |
| PCB | Aroclor 1242 | SO | 43 | mg/kg | <0.0086 | <0.01 | n.d. | n.d. | n.d. | n.d. | n.d. | 0 | 0 | 0 | 0 | 0.95 | 0 | 0 | 0.23 | 0 | 0 | 0.0012 |
| PCB | Aroclor 1248 | SO | 43 | mg/kg | <0.0086 | <0.01 | n.d. | n.d. | n.d. | n.d. | n.d. | 0 | 0 | 0 | 0 | 0.95 | 0 | 0 | 0.23 | 0 | 0 | 0.0012 |
| PCB | Aroclor 1254 | SO | 43 | mg/kg | <0.0089 | 0.21 | n.d. | n.d. | n.d. | n.d. | 0.20 | 3 | 7 | 0.00 | 0 | 0.97 | 1 | 2 | 0.12 | 3 | 7 | 0.002 |
| PCB | Aroclor 1260 | SO | 43 | mg/kg | <0.0089 | <0.011 | n.d. | n.d. | n.d. | n.d. | n.d. | 0 | 0 | 0 | 0 | 0.99 | 0 | 0 | 0.24 | 0 | 0 | 0.0055 |
| PCB | Aroclor 1268 | SO | 43 | mg/kg | <0.0089 | <0.011 | n.d. | n.d. | n.d. | n.d. | n.d. | 0 | 0 | - | - | - | - | - | - | - | - | - |
| PCB | Aroclor-1262 | SO | 43 | mg/kg | <0.0089 | <0.011 | n.d. | n.d. | n.d. | n.d. | n.d. | 0 | 0 | - | - | - | - | - | - | - | - | - |
| PCB | Polychlorinated biphenyls, Total | SO | 43 | mg/kg | <0.0089 | 0.21 | n.d. | n.d. | n.d. | n.d. | 0.20 | 3 | 7 | 0 | 0 | 0.94 | 0 | 0 | 0.23 | 3 | 7 | 0.0068 |
| SVOC | 1,1'-Biphenyl | SO | 43 | mg/kg | <0.027 | 0.31 | n.d. | n.d. | n.d. | n.d. | 0.28 | 3 | 7 | 0 | 0 | 20 | 0 | 0 | 4.7 | 3 | 7 | 0.00087 |
| SVOC | 1,2,4,5-Tetrachlorobenzene | SO | 43 | mg/kg | <0.024 | <0.61 | n.d. | n.d. | n.d. | n.d. | n.d. | 0 | 0 | 0 | 0 | 35 | 0 | 0 | 2.3 | 0 | 0 | 0.00079 |
| SVOC | 1,4-Dioxane | SO | 43 | mg/kg | <0.085 | <2.2 | n.d. | n.d. | n.d. | n.d. | n.d. | 0 | 0 | 0 | 0 | 24 | 0 | 0 | 5.3 | 0 | 0 | 9.4E-05 |
| SVOC | 2,2'-oxybis[1-chloropropane] | SO | 43 | mg/kg | <0.013 | <0.34 | n.d. | n.d. | n.d. | n.d. | n.d. | 0 | 0 | 0 | 0 | 4700 | 0 | 0 | 310 | 0 | 0 | 0.026 |
| SVOC | 2,3,4,6-Tetrachlorophenol | SO | 43 | mg/kg | <0.03 | <0.77 | n.d. | n.d. | n.d. | n.d. | n.d. | 0 | 0 | 0 | 0 | 2500 | 0 | 0 | 190 | 0 | 0 | 0.018 |
| SVOC | 2,4,5-Trichlorophenol | SO | 43 | mg/kg | <0.032 | <0.81 | n.d. | n.d. | n.d. | n.d. | n.d. | 0 | 0 | 0 | 0 | 8200 | 0 | 0 | 630 | 0 | 0 | 0.4 |
| SVOC | 2,4,6-Trichlorophenol | SO | 43 | mg/kg | <0.009 | <0.23 | n.d. | n.d. | n.d. | n.d. | n.d. | 0 | 0 | 0 | 0 | 82 | 0 | 0 | 6.3 | 0 | 0 | 0.0012 |
| SVOC | 2,4-Dichlorophenol | SO | 43 | mg/kg | <0.0075 | <0.19 | n.d. | n.d. | n.d. | n.d. | n.d. | 0 | 0 | 0 | 0 | 250 | 0 | 0 | 19 | 0 | 0 | 0.0023 |
| SVOC | 2,4-Dimethylphenol | SO | 43 | mg/kg | <0.07 | <1.8 | n.d. | n.d. | n.d. | n.d. | n.d. | 0 | 0 | 0.00 | 0 | 1600 | 0 | 0 | 130 | 0 | 0 | 0.042 |
| SVOC | 2,4-Dinitrophenol | SO | 43 | mg/kg | <0.24 | <6.2 | n.d. | n.d. | n.d. | n.d. | n.d. | 0 | 0 | 0 | 0 | 160 | 0 | 0 | 13 | 0 | 0 | 0.0044 |
| SVOC | 2,4-Dinitrotoluene | SO | 43 | mg/kg | <0.013 | <0.32 | n.d. | n.d. | n.d. | n.d. | n.d. | 0 | 0 | 0 | 0 | 7.4 | 0 | 0 | 1.7 | 0 | 0 | 0.00032 |
| SVOC | 2,6-Dinitrotoluene | SO | 43 | mg/kg | <0.017 | <0.43 | n.d. | n.d. | n.d. | n.d. | n.d. | 0 | 0 | 0 | 0 | 1.5 | 0 | 0 | 0.36 | 0 | 0 | 6.7E-05 |
| SVOC | 2-Chloronaphthalene | SO | 43 | mg/kg | <0.0072 | <0.18 | n.d. | n.d. | n.d. | n.d. | n.d. | 0 | 0 | 0 | 0 | 6000 | 0 | 0 | 480 | 0 | 0 | 0.39 |
| SVOC | 2-Chlorophenol | SO | 43 | mg/kg | <0.0081 | <0.21 | n.d. | n.d. | n.d. | n.d. | n.d. | 0 | 0 | 0 | 0 | 580 | 0 | 0 | 39 | 0 | 0 | 0.0089 |
| SVOC | 2-Methylnaphthalene | SO | 43 | mg/kg | <0.0074 | 3.70 | 0.16 | 0.03 | 0.59 | n.d. | 0.63 | 37 | 86 | 0 | 0 | 300 | 0 | 0 | 24 | 23 | 53 | 0.019 |
| SVOC | 2-Methylphenol | SO | 43 | mg/kg | <0.014 | <0.36 | n.d. | n.d. | n.d. | n.d. | n.d. | 0 | 0 | 0 | 0 | 4100 | 0 | 0 | 320 | 0 | 0 | 0.075 |

**Table 12. Operation Area Surface Soil Analytical Results Statistical Summary**
**Columbia Falls Aluminum Company, LLC, Phase I Site Characterization, 2000 Aluminum Drive, Columbia Falls, MT**

| Group | Analyte | Matrix | No. of Results | Unit | Min | Max | Mean | Median | Standard Deviation | 5th Percentile | 95th Percentile | # > LOD | % > LOD | Industrial RSL | | | Residential RSL | | | Risk SSL | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | | | | | | | No. Exceeding | % Exceeding | Action Level | No. Exceeding | % Exceeding | Action Level | No. Exceeding | % Exceeding | Action Level |
| SVOC | 2-Nitroaniline | SO | 43 | mg/kg | <0.01 | <0.27 | n.d. | n.d. | n.d. | n.d. | n.d. | 0 | 0 | 0 | 0 | 800 | 0 | 0 | 63 | 0 | 0 | 0.008 |
| SVOC | 2-Nitrophenol | SO | 43 | mg/kg | <0.011 | <0.27 | n.d. | n.d. | n.d. | n.d. | n.d. | 0 | 0 | - | - | - | - | - | - | - | - | - |
| SVOC | 3 & 4 Methylphenol | SO | 43 | mg/kg | <0.0085 | 0.01 | n.d. | n.d. | n.d. | n.d. | n.d. | 1 | 2 | - | - | - | - | - | - | - | - | - |
| SVOC | 3,3'-Dichlorobenzidine | SO | 43 | mg/kg | <0.035 | <0.91 | n.d. | n.d. | n.d. | n.d. | n.d. | 0 | 0 | 0 | 0 | 5.1 | 0 | 0 | 1.2 | 0 | 0 | 0.00082 |
| SVOC | 3-Nitroaniline | SO | 43 | mg/kg | <0.0094 | <0.24 | n.d. | n.d. | n.d. | n.d. | n.d. | 0 | 0 | - | - | - | - | - | - | - | - | - |
| SVOC | 4,6-Dinitro-2-methylphenol | SO | 43 | mg/kg | <0.085 | <2.2 | n.d. | n.d. | n.d. | n.d. | n.d. | 0 | 0 | 0.00 | 0 | 6.6 | 0 | 0 | 0.51 | 0 | 0 | 0.00026 |
| SVOC | 4-Bromophenyl phenyl ether | SO | 43 | mg/kg | <0.01 | <0.26 | n.d. | n.d. | n.d. | n.d. | n.d. | 0 | 0 | - | - | - | - | - | - | - | - | - |
| SVOC | 4-Chloro-3-methylphenol | SO | 43 | mg/kg | <0.014 | <0.35 | n.d. | n.d. | n.d. | n.d. | n.d. | 0 | 0 | 0 | 0 | 8200 | 0 | 0 | 630 | 0 | 0 | 0.17 |
| SVOC | 4-Chloroaniline | SO | 43 | mg/kg | <0.0082 | <0.21 | n.d. | n.d. | n.d. | n.d. | n.d. | 0 | 0 | 0 | 0 | 11 | 0 | 0 | 2.7 | 0 | 0 | 0.00016 |
| SVOC | 4-Chlorophenyl phenyl ether | SO | 43 | mg/kg | <0.0095 | <0.24 | n.d. | n.d. | n.d. | n.d. | n.d. | 0 | 0 | - | - | - | - | - | - | - | - | - |
| SVOC | 4-Nitroaniline | SO | 43 | mg/kg | <0.012 | <0.31 | n.d. | n.d. | n.d. | n.d. | n.d. | 0 | 0 | 0 | 0 | 110 | 0 | 0 | 25 | 0 | 0 | 0.0016 |
| SVOC | 4-Nitrophenol | SO | 43 | mg/kg | <0.15 | <3.9 | n.d. | n.d. | n.d. | n.d. | n.d. | 0 | 0 | - | - | - | - | - | - | - | - | - |
| SVOC | Acenaphthene | SO | 43 | mg/kg | 0.01 | 7.10 | 0.70 | 0.21 | 1.53 | 0.04 | 4.52 | 43 | 100 | 0 | 0 | 4500 | 0 | 0 | 360 | 7 | 16 | 0.55 |
| SVOC | Acenaphthylene | SO | 43 | mg/kg | <0.0082 | 0.20 | n.d. | n.d. | n.d. | n.d. | 0.16 | 6 | 14 | - | - | - | - | - | - | - | - | - |
| SVOC | Acetophenone | SO | 43 | mg/kg | <0.0069 | 0.03 | n.d. | n.d. | n.d. | n.d. | 0.03 | 6 | 14 | 0 | 0 | 12000 | 0 | 0 | 780 | 0 | 0 | 0.058 |
| SVOC | Anthracene | SO | 43 | mg/kg | <0.032 | 15.00 | 1.51 | 0.40 | 3.33 | 0.08 | 8.50 | 41 | 95 | 0 | 0 | 23000 | 0 | 0 | 1800 | 3 | 7 | 5.8 |
| SVOC | Atrazine | SO | 43 | mg/kg | <0.014 | <0.36 | n.d. | n.d. | n.d. | n.d. | n.d. | 0 | 0 | 0 | 0 | 10 | 0 | 0 | 2.4 | 0 | 0 | 0.0002 |
| SVOC | Benzaldehyde | SO | 43 | mg/kg | <0.024 | 0.05 | n.d. | n.d. | n.d. | n.d. | 0.04 | 3 | 7 | 0 | 0 | 820 | 0 | 0 | 170 | 3 | 7 | 0.0041 |
| SVOC | Benzo[a]anthracene | SO | 43 | mg/kg | 0.25 | 100.00 | 7.16 | 1.70 | 16.80 | 0.32 | 32.90 | 43 | 100 | 14.00 | 33 | 2.9 | 43 | 100 | 0.16 | 43 | 100 | 0.0042 |
| SVOC | Benzo[a]pyrene | SO | 43 | mg/kg | 0.34 | 110.00 | 7.80 | 2.00 | 18.39 | 0.38 | 29.40 | 43 | 100 | 43 | 100 | 0.29 | 43 | 100 | 0.016 | 43 | 100 | 0.004 |
| SVOC | Benzo[b]fluoranthene | SO | 43 | mg/kg | 0.42 | 130.00 | 11.01 | 3.40 | 22.25 | 0.74 | 44.40 | 43 | 100 | 24 | 56 | 2.9 | 43 | 100 | 0.16 | 43 | 100 | 0.041 |
| SVOC | Benzo[g,h,i]perylene | SO | 43 | mg/kg | 0.34 | 90.00 | 7.56 | 2.20 | 15.15 | 0.42 | 25.50 | 43 | 100 | - | - | - | - | - | - | - | - | - |
| SVOC | Benzo[k]fluoranthene | SO | 43 | mg/kg | 0.16 | 47.00 | 3.99 | 1.20 | 8.19 | 0.24 | 17.40 | 43 | 100 | 1 | 2 | 29 | 17 | 40 | 1.6 | 35 | 81 | 0.4 |
| SVOC | Bis(2-chloroethoxy)methane | SO | 43 | mg/kg | <0.0099 | <0.25 | n.d. | n.d. | n.d. | n.d. | n.d. | 0 | 0 | 0 | 0 | 250 | 0 | 0 | 19 | 0 | 0 | 0.0013 |
| SVOC | Bis(2-chloroethyl)ether | SO | 43 | mg/kg | <0.0075 | <0.19 | n.d. | n.d. | n.d. | n.d. | n.d. | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0.23 | 0 | 0 | 3.6E-06 |
| SVOC | Bis(2-ethylhexyl) phthalate | SO | 43 | mg/kg | <0.012 | 0.81 | 0.04 | n.d. | 0.13 | n.d. | 0.49 | 13 | 30 | 0 | 0 | 160 | 0 | 0 | 39 | 0 | 0 | 1.3 |
| SVOC | Butyl benzyl phthalate | SO | 43 | mg/kg | <0.0098 | 0.73 | 0.05 | n.d. | 0.15 | n.d. | 0.67 | 9 | 21 | 0.00 | 0 | 1200 | 0 | 0 | 290 | 3 | 7 | 0.24 |
| SVOC | Caprolactam | SO | 43 | mg/kg | <0.023 | <0.59 | n.d. | n.d. | n.d. | n.d. | n.d. | 0 | 0 | 0 | 0 | 40000 | 0 | 0 | 3100 | 0 | 0 | 0.25 |
| SVOC | Carbazole | SO | 43 | mg/kg | 0.03 | 11.00 | 1.03 | 0.30 | 2.20 | 0.05 | 4.19 | 43 | 100 | - | - | - | - | - | - | - | - | - |
| SVOC | Chrysene | SO | 43 | mg/kg | 0.36 | 100.00 | 8.69 | 2.90 | 17.22 | 0.46 | 35.30 | 43 | 100 | 0 | 0 | 290 | 7 | 16 | 16 | 31 | 72 | 1.2 |
| SVOC | Dibenz(a,h)anthracene | SO | 43 | mg/kg | 0.07 | 26.00 | 2.11 | 0.59 | 4.31 | 0.10 | 6.75 | 43 | 100 | 30 | 70 | 0.29 | 43 | 100 | 0.016 | 43 | 100 | 0.013 |
| SVOC | Dibenzofuran | SO | 43 | mg/kg | <0.01 | 3.90 | 0.27 | 0.09 | 0.69 | 0.01 | 1.26 | 42 | 98 | 0 | 0 | 100 | 0 | 0 | 7.3 | 38 | 88 | 0.015 |
| SVOC | Diethyl phthalate | SO | 43 | mg/kg | <0.009 | <0.23 | n.d. | n.d. | n.d. | n.d. | n.d. | 0 | 0 | 0 | 0 | 66000 | 0 | 0 | 5100 | 0 | 0 | 0.61 |
| SVOC | Dimethyl phthalate | SO | 43 | mg/kg | <0.0092 | <0.24 | n.d. | n.d. | n.d. | n.d. | n.d. | 0 | 0 | - | - | - | - | - | - | - | - | - |
| SVOC | Di-n-butyl phthalate | SO | 43 | mg/kg | <0.0095 | 0.10 | 0.01 | n.d. | 0.02 | n.d. | 0.08 | 16 | 37 | 0.00 | 0 | 8200 | 0 | 0 | 630 | 0 | 0 | 0.23 |
| SVOC | Di-n-octyl phthalate | SO | 43 | mg/kg | <0.016 | <0.41 | n.d. | n.d. | n.d. | n.d. | n.d. | 0 | 0 | 0.00 | 0 | 820 | 0 | 0 | 63 | 0 | 0 | 5.7 |

**Table 12. Operation Area Surface Soil Analytical Results Statistical Summary**
**Columbia Falls Aluminum Company, LLC, Phase I Site Characterization, 2000 Aluminum Drive, Columbia Falls, MT**

| | | | | | | | | | | | | | | Industrial RSL | | | Residential RSL | | | Risk SSL | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Group | Analyte | Matrix | No. of Results | Unit | Min | Max | Mean | Median | Standard Deviation | 5th Percentile | 95th Percentile | # > LOD | % > LOD | No. Exceeding | % Exceeding | Action Level | No. Exceeding | % Exceeding | Action Level | No. Exceeding | % Exceeding | Action Level |
| SVOC | Fluoranthene | SO | 43 | mg/kg | 0.41 | 120.00 | 10.62 | 3.20 | 21.92 | 0.58 | 41.70 | 43 | 100 | 0 | 0 | 3000 | 0 | 0 | 240 | 8 | 19 | 8.9 |
| SVOC | Fluorene | SO | 43 | mg/kg | <0.0078 | 5.80 | 0.46 | 0.13 | 1.12 | 0.02 | 2.50 | 41 | 95 | 0 | 0 | 3000 | 0 | 0 | 240 | 5 | 12 | 0.54 |
| SVOC | Hexachlorobenzene | SO | 43 | mg/kg | <0.013 | <0.33 | n.d. | n.d. | n.d. | n.d. | n.d. | 0 | 0 | 0.00 | 0 | 0.96 | 0 | 0 | 0.21 | 0 | 0 | 0.00012 |
| SVOC | Hexachlorobutadiene | SO | 43 | mg/kg | <0.0089 | <0.23 | n.d. | n.d. | n.d. | n.d. | n.d. | 0 | 0 | 0 | 0 | 5.3 | 0 | 0 | 1.2 | 0 | 0 | 0.00027 |
| SVOC | Hexachlorocyclopentadiene | SO | 43 | mg/kg | <0.02 | <0.51 | n.d. | n.d. | n.d. | n.d. | n.d. | 0 | 0 | 0 | 0 | 0.75 | 0 | 0 | 0.18 | 0 | 0 | 0.00013 |
| SVOC | Hexachloroethane | SO | 43 | mg/kg | <0.012 | <0.3 | n.d. | n.d. | n.d. | n.d. | n.d. | 0 | 0 | 0 | 0 | 8 | 0 | 0 | 1.8 | 0 | 0 | 0.0002 |
| SVOC | Indeno[1,2,3-cd]pyrene | SO | 43 | mg/kg | 0.38 | 100.00 | 7.93 | 2.30 | 16.66 | 0.41 | 24.90 | 43 | 100 | 20 | 47 | 2.9 | 43 | 100 | 0.16 | 43 | 100 | 0.13 |
| SVOC | Isophorone | SO | 43 | mg/kg | <0.0069 | 0.38 | 0.02 | n.d. | 0.06 | n.d. | 0.30 | 7 | 16 | 0 | 0 | 2400 | 0 | 0 | 570 | 5 | 12 | 0.026 |
| SVOC | Naphthalene | SO | 43 | mg/kg | <0.0085 | 3.00 | 0.23 | 0.05 | 0.58 | n.d. | 1.48 | 37 | 86 | 0 | 0 | 17 | 0 | 0 | 3.8 | 37 | 86 | 0.00054 |
| SVOC | Nitrobenzene | SO | 43 | mg/kg | <0.01 | <0.26 | n.d. | n.d. | n.d. | n.d. | n.d. | 0 | 0 | 0 | 0 | 22 | 0 | 0 | 5.1 | 0 | 0 | 9.2E-05 |
| SVOC | N-Nitrosodi-n-propylamine | SO | 43 | mg/kg | <0.011 | <0.27 | n.d. | n.d. | n.d. | n.d. | n.d. | 0 | 0 | 0 | 0 | 0.33 | 0 | 0 | 0.078 | 0 | 0 | 8.1E-06 |
| SVOC | N-Nitrosodiphenylamine | SO | 43 | mg/kg | <0.029 | <0.74 | n.d. | n.d. | n.d. | n.d. | n.d. | 0 | 0 | 0 | 0 | 470 | 0 | 0 | 110 | 0 | 0 | 0.067 |
| SVOC | Pentachlorophenol | SO | 43 | mg/kg | <0.038 | 0.10 | n.d. | n.d. | n.d. | n.d. | n.d. | 1 | 2 | 0 | 0 | 4 | 0 | 0 | 1 | 1 | 2 | 5.7E-05 |
| SVOC | Phenanthrene | SO | 43 | mg/kg | 0.18 | 63.00 | 6.31 | 2.10 | 13.21 | 0.32 | 31.50 | 43 | 100 | - | - | - | - | - | - | - | - | - |
| SVOC | Phenol | SO | 43 | mg/kg | <0.01 | 0.03 | n.d. | n.d. | n.d. | n.d. | 0.03 | 5 | 12 | 0 | 0 | 25000 | 0 | 0 | 1900 | 0 | 0 | 0.33 |
| SVOC | Pyrene | SO | 43 | mg/kg | 0.44 | 120.00 | 10.48 | 2.90 | 22.04 | 0.65 | 47.20 | 43 | 100 | 0 | 0 | 2300 | 0 | 0 | 180 | 31 | 72 | 1.3 |

mg/kg - Milligrams per Kilograms
n.d - Non Detect
LOD - Limit of Detection
Industiral RSL - Environmental Protection Agency Industrial Soil Regional Screening Level
Residential RSL - Environmental Protection Agency Residnetial Soil Regional Screening Level
Risk SSL - Environmental Protection Agency Human Health Protection of Ground Water - Risk-based Soil Screening Level

**Table 13. Operational Area Shallow Soil Analytical Results Statistical Summary**
**Columbia Falls Aluminum Company, LLC, Phase I Site Characterization, 2000 Aluminum Drive, Columbia Falls, MT**

| | | | | | | | | | | | | | | Industrial RSL | | | Residential RSL | | | Risk SSL | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Group | Analyte | Matrix | No. of Results | Unit | Min | Max | Mean | Median | Standard Deviation | 5th Percentile | 95th Percentile | # > LOD | % > LOD | No. Exceeding | % Exceeding | Action Level | No. Exceeding | % Exceeding | Action Level | No. Exceeding | % Exceeding | Action Level |
| GENCHEM | Fluoride | SO | 43 | mg/kg | 16.6 | 946 | 238.92 | 136.00 | 244.71 | 29.29 | 702.80 | 43 | 100 | 0 | 0 | 4700 | 11 | 26 | 310 | 43 | 100 | 12 |
| METALS | Aluminum | SO | 43 | mg/kg | 8620 | 25600 | 16481.86 | 15800.00 | 3976.63 | 10800.00 | 23090.00 | 43 | 100 | 0 | 0 | 110000 | 43 | 100 | 7700 | 43 | 100 | 3000 |
| METALS | Antimony | SO | 43 | mg/kg | <0.35 | 1.9 | 0.20 | 0.14 | 0.32 | n.d. | 0.85 | 31 | 72 | 0 | 0 | 47 | 0 | 0 | 3.1 | 31 | 72 | 0.035 |
| METALS | Arsenic | SO | 43 | mg/kg | 3.4 | 8.6 | 5.48 | 5.20 | 1.05 | 4.31 | 7.47 | 43 | 100 | 43 | 100 | 3 | 43 | 100 | 0.68 | 43 | 100 | 0.0015 |
| METALS | Barium | SO | 43 | mg/kg | 66.8 | 302 | 141.64 | 123.00 | 51.64 | 84.87 | 253.40 | 43 | 100 | 0 | 0 | 22000 | 0 | 0 | 1500 | 43 | 100 | 16 |
| METALS | Beryllium | SO | 43 | mg/kg | 0.36 | 1.2 | 0.64 | 0.59 | 0.18 | 0.44 | 0.90 | 43 | 100 | 0 | 0 | 230 | 0 | 0 | 16 | 0 | 0 | 1.9 |
| METALS | Cadmium | SO | 43 | mg/kg | <0.26 | 0.46 | 0.11 | 0.12 | 0.10 | n.d. | 0.29 | 31 | 72 | 0.00 | 0 | 98 | 0 | 0 | 7.1 | 30 | 70 | 0.069 |
| METALS | Calcium | SO | 43 | mg/kg | 2890 | 37300 | 18603.95 | 18800.00 | 7860.83 | 6225.00 | 31210.00 | 43 | 100 | - | - | - | - | - | - | - | - | - |
| METALS | Chromium | SO | 43 | mg/kg | 7.5 | 54.4 | 17.22 | 16.70 | 7.03 | 11.10 | 22.99 | 43 | 100 | - | - | - | - | - | - | - | - | - |
| METALS | Cobalt | SO | 43 | mg/kg | 4.8 | 7.9 | 6.12 | 6.10 | 0.59 | 5.31 | 6.98 | 43 | 100 | 0 | 0 | 35 | 43 | 100 | 2.3 | 43 | 100 | 0.027 |
| METALS | Copper | SO | 43 | mg/kg | 11 | 721 | 46.29 | 17.60 | 120.50 | 12.65 | 70.56 | 43 | 100 | 0.00 | 0 | 4700 | 2 | 5 | 310 | 43 | 100 | 2.8 |
| METALS | Cyanide, Total | SO | 43 | mg/kg | 0.017 | 6.3 | 0.64 | 0.18 | 1.17 | 0.04 | 2.48 | 43 | 100 | 0 | 0 | 15 | 3 | 7 | 2.3 | 43 | 100 | 0.0015 |
| METALS | Iron | SO | 43 | mg/kg | 10300 | 22900 | 16716.28 | 16600.00 | 2122.66 | 14400.00 | 20130.00 | 43 | 100 | 0 | 0 | 82000 | 43 | 100 | 5500 | 43 | 100 | 35 |
| METALS | Lead | SO | 43 | mg/kg | 5.8 | 52.6 | 15.50 | 13.30 | 9.15 | 8.68 | 29.20 | 43 | 100 | 0.00 | 0 | 800 | 0 | 0 | 400 | - | - | - |
| METALS | Magnesium | SO | 43 | mg/kg | 6830 | 13900 | 10903.49 | 11300.00 | 1692.60 | 7658.00 | 13190.00 | 43 | 100 | - | - | - | - | - | - | - | - | - |
| METALS | Manganese | SO | 43 | mg/kg | 226 | 686 | 486.09 | 467.00 | 92.58 | 366.20 | 657.60 | 43 | 100 | 0 | 0 | 2600 | 43 | 100 | 180 | 43 | 100 | 2.8 |
| METALS | Mercury | SO | 43 | mg/kg | <0.014 | 0.058 | 0.02 | 0.02 | 0.01 | n.d. | 0.03 | 32 | 74 | 0 | 0 | 4.6 | 0 | 0 | 1.1 | 32 | 74 | 0.0033 |
| METALS | Nickel | SO | 43 | mg/kg | 8.3 | 38.5 | 17.00 | 15.80 | 5.45 | 12.01 | 22.40 | 43 | 100 | 0 | 0 | 2200 | 0 | 0 | 150 | 43 | 100 | 2.6 |
| METALS | Potassium | SO | 43 | mg/kg | 704 | 2490 | 1206.93 | 1100.00 | 404.37 | 765.40 | 2150.00 | 43 | 100 | - | - | - | - | - | - | - | - | - |
| METALS | Selenium | SO | 43 | mg/kg | <0.33 | 2 | 1.06 | 1.10 | 0.71 | n.d. | 1.90 | 33 | 77 | 0.00 | 0 | 580 | 0 | 0 | 39 | 33 | 77 | 0.052 |
| METALS | Silver | SO | 43 | mg/kg | <0.64 | 0.27 | 0.05 | 0.04 | 0.06 | n.d. | 0.23 | 31 | 72 | 0 | 0 | 580 | 0 | 0 | 39 | 7 | 16 | 0.08 |
| METALS | Sodium | SO | 43 | mg/kg | <37 | 3350 | 666.91 | 233.00 | 921.29 | n.d. | 2812.00 | 39 | 91 | - | - | - | - | - | - | - | - | - |
| METALS | Thallium | SO | 43 | mg/kg | <0.13 | 0.15 | 0.07 | 0.09 | 0.05 | n.d. | 0.14 | 31 | 72 | 0 | 0 | 1.2 | 28 | 65 | 0.078 | 31 | 72 | 0.0014 |
| METALS | Vanadium | SO | 43 | mg/kg | 8 | 31.2 | 14.35 | 13.40 | 4.17 | 9.31 | 21.32 | 43 | 100 | 0.00 | 0 | 580 | 0 | 0 | 39 | 41 | 95 | 8.6 |
| METALS | Zinc | SO | 43 | mg/kg | 29.3 | 306 | 72.42 | 53.40 | 52.53 | 44.87 | 198.10 | 43 | 100 | 0 | 0 | 35000 | 0 | 0 | 2300 | 42 | 98 | 37 |
| PCB | Aroclor 1016 | SO | 43 | mg/kg | <8.9E-05 | <0.01 | n.d. | n.d. | n.d. | n.d. | n.d. | 0 | 0 | 0 | 0 | 5.1 | 0 | 0 | 0.41 | 0 | 0 | 0.013 |
| PCB | Aroclor 1221 | SO | 43 | mg/kg | <8.9E-05 | <0.01 | n.d. | n.d. | n.d. | n.d. | n.d. | 0 | 0 | 0 | 0 | 0.83 | 0 | 0 | 0.2 | 0 | 0 | 0.00008 |
| PCB | Aroclor 1232 | SO | 43 | mg/kg | <8.9E-05 | <0.01 | n.d. | n.d. | n.d. | n.d. | n.d. | 0 | 0 | 0 | 0 | 0.72 | 0 | 0 | 0.17 | 0 | 0 | 0.00008 |
| PCB | Aroclor 1242 | SO | 43 | mg/kg | <8.9E-05 | <0.01 | n.d. | n.d. | n.d. | n.d. | n.d. | 0 | 0 | 0 | 0 | 0.95 | 0 | 0 | 0.23 | 0 | 0 | 0.0012 |
| PCB | Aroclor 1248 | SO | 43 | mg/kg | <8.9E-05 | <0.01 | n.d. | n.d. | n.d. | n.d. | n.d. | 0 | 0 | 0 | 0 | 0.95 | 0 | 0 | 0.23 | 0 | 0 | 0.0012 |
| PCB | Aroclor 1254 | SO | 43 | mg/kg | <9.2E-05 | 0.16 | n.d. | n.d. | n.d. | n.d. | 0.15 | 3 | 7 | 0 | 0 | 0.97 | 1 | 2 | 0.12 | 3 | 7 | 0.002 |
| PCB | Aroclor 1260 | SO | 43 | mg/kg | <9.2E-05 | <0.011 | n.d. | n.d. | n.d. | n.d. | n.d. | 0 | 0 | 0 | 0 | 0.99 | 0 | 0 | 0.24 | 0 | 0 | 0.0055 |
| PCB | Aroclor 1268 | SO | 43 | mg/kg | <9.2E-05 | <0.011 | n.d. | n.d. | n.d. | n.d. | n.d. | 0 | 0 | - | - | - | - | - | - | - | - | - |
| PCB | Aroclor-1262 | SO | 43 | mg/kg | <9.2E-05 | <0.011 | n.d. | n.d. | n.d. | n.d. | n.d. | 0 | 0 | - | - | - | - | - | - | - | - | - |
| PCB | Polychlorinated biphenyls, Total | SO | 43 | mg/kg | <9.2E-05 | 0.16 | n.d. | n.d. | n.d. | n.d. | 0.15 | 3 | 7 | 0 | 0 | 0.94 | 0 | 0 | 0.23 | 3 | 7 | 0.0068 |
| SVOC | 1,1'-Biphenyl | SO | 43 | mg/kg | <0.027 | 0.037 | n.d. | n.d. | n.d. | n.d. | n.d. | 1 | 2 | 0 | 0 | 20 | 0 | 0 | 4.7 | 1 | 2 | 0.00087 |
| SVOC | 1,2,4,5-Tetrachlorobenzene | SO | 43 | mg/kg | <0.023 | <0.53 | n.d. | n.d. | n.d. | n.d. | n.d. | 0 | 0 | 0 | 0 | 35 | 0 | 0 | 2.3 | 0 | 0 | 0.00079 |

**Table 13. Operational Area Shallow Soil Analytical Results Statistical Summary**
**Columbia Falls Aluminum Company, LLC, Phase I Site Characterization, 2000 Aluminum Drive, Columbia Falls, MT**

| | | | | | | | | | | | | | | Industrial RSL | | | Residential RSL | | | Risk SSL | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Group | Analyte | Matrix | No. of Results | Unit | Min | Max | Mean | Median | Standard Deviation | 5th Percentile | 95th Percentile | # > LOD | % > LOD | No. Exceeding | % Exceeding | Action Level | No. Exceeding | % Exceeding | Action Level | No. Exceeding | % Exceeding | Action Level |
| SVOC | 1,4-Dioxane | SO | 43 | mg/kg | <0.084 | <1.9 | n.d. | n.d. | n.d. | n.d. | n.d. | 0 | 0 | 0.00 | 0 | 24 | 0 | 0 | 5.3 | 0 | 0 | 0.000094 |
| SVOC | 2,2'-oxybis[1-chloropropane] | SO | 43 | mg/kg | <0.013 | <0.29 | n.d. | n.d. | n.d. | n.d. | n.d. | 0 | 0 | 0 | 0 | 4700 | 0 | 0 | 310 | 0 | 0 | 0.026 |
| SVOC | 2,3,4,6-Tetrachlorophenol | SO | 43 | mg/kg | <0.03 | <0.67 | n.d. | n.d. | n.d. | n.d. | n.d. | 0 | 0 | 0 | 0 | 2500 | 0 | 0 | 190 | 0 | 0 | 0.018 |
| SVOC | 2,4,5-Trichlorophenol | SO | 43 | mg/kg | <0.031 | <0.71 | n.d. | n.d. | n.d. | n.d. | n.d. | 0 | 0 | 0 | 0 | 8200 | 0 | 0 | 630 | 0 | 0 | 0.4 |
| SVOC | 2,4,6-Trichlorophenol | SO | 43 | mg/kg | <0.0089 | <0.2 | n.d. | n.d. | n.d. | n.d. | n.d. | 0 | 0 | 0 | 0 | 82 | 0 | 0 | 6.3 | 0 | 0 | 0.0012 |
| SVOC | 2,4-Dichlorophenol | SO | 43 | mg/kg | <0.0074 | <0.17 | n.d. | n.d. | n.d. | n.d. | n.d. | 0 | 0 | 0 | 0 | 250 | 0 | 0 | 19 | 0 | 0 | 0.0023 |
| SVOC | 2,4-Dimethylphenol | SO | 43 | mg/kg | <0.069 | <1.6 | n.d. | n.d. | n.d. | n.d. | n.d. | 0 | 0 | 0 | 0 | 1600 | 0 | 0 | 130 | 0 | 0 | 0.042 |
| SVOC | 2,4-Dinitrophenol | SO | 43 | mg/kg | <0.24 | <5.4 | n.d. | n.d. | n.d. | n.d. | n.d. | 0 | 0 | 0 | 0 | 160 | 0 | 0 | 13 | 0 | 0 | 0.0044 |
| SVOC | 2,4-Dinitrotoluene | SO | 43 | mg/kg | <0.012 | <0.28 | n.d. | n.d. | n.d. | n.d. | n.d. | 0 | 0 | 0 | 0 | 7.4 | 0 | 0 | 1.7 | 0 | 0 | 0.00032 |
| SVOC | 2,6-Dinitrotoluene | SO | 43 | mg/kg | <0.017 | <0.38 | n.d. | n.d. | n.d. | n.d. | n.d. | 0 | 0 | 0 | 0 | 1.5 | 0 | 0 | 0.36 | 0 | 0 | 0.000067 |
| SVOC | 2-Chloronaphthalene | SO | 43 | mg/kg | <0.0071 | <0.16 | n.d. | n.d. | n.d. | n.d. | n.d. | 0 | 0 | 0 | 0 | 6000 | 0 | 0 | 480 | 0 | 0 | 0.39 |
| SVOC | 2-Chlorophenol | SO | 43 | mg/kg | <0.008 | <0.18 | n.d. | n.d. | n.d. | n.d. | n.d. | 0 | 0 | 0 | 0 | 580 | 0 | 0 | 39 | 0 | 0 | 0.0089 |
| SVOC | 2-Methylnaphthalene | SO | 43 | mg/kg | <0.0069 | 2.7 | 0.11 | 0.01 | 0.42 | n.d. | 0.57 | 31 | 72 | 0 | 0 | 300 | 0 | 0 | 24 | 15 | 35 | 0.019 |
| SVOC | 2-Methylphenol | SO | 43 | mg/kg | <0.014 | <0.31 | n.d. | n.d. | n.d. | n.d. | n.d. | 0 | 0 | 0 | 0 | 4100 | 0 | 0 | 320 | 0 | 0 | 0.075 |
| SVOC | 2-Nitroaniline | SO | 43 | mg/kg | <0.01 | <0.24 | n.d. | n.d. | n.d. | n.d. | n.d. | 0 | 0 | 0.00 | 0 | 800 | 0 | 0 | 63 | 0 | 0 | 0.008 |
| SVOC | 2-Nitrophenol | SO | 43 | mg/kg | <0.011 | <0.24 | n.d. | n.d. | n.d. | n.d. | n.d. | 0 | 0 | - | - | - | - | - | - | - | - | - |
| SVOC | 3 & 4 Methylphenol | SO | 43 | mg/kg | <0.0084 | 0.017 | n.d. | n.d. | n.d. | n.d. | n.d. | 1 | 2 | - | - | - | - | - | - | - | - | - |
| SVOC | 3,3'-Dichlorobenzidine | SO | 43 | mg/kg | <0.035 | <0.8 | n.d. | n.d. | n.d. | n.d. | n.d. | 0 | 0 | 0 | 0 | 5.1 | 0 | 0 | 1.2 | 0 | 0 | 0.00082 |
| SVOC | 3-Nitroaniline | SO | 43 | mg/kg | <0.0093 | <0.21 | n.d. | n.d. | n.d. | n.d. | n.d. | 0 | 0 | - | - | - | - | - | - | - | - | - |
| SVOC | 4,6-Dinitro-2-methylphenol | SO | 43 | mg/kg | <0.084 | <1.9 | n.d. | n.d. | n.d. | n.d. | n.d. | 0 | 0 | 0 | 0 | 6.6 | 0 | 0 | 0.51 | 0 | 0 | 0.00026 |
| SVOC | 4-Bromophenyl phenyl ether | SO | 43 | mg/kg | <0.0099 | <0.22 | n.d. | n.d. | n.d. | n.d. | n.d. | 0 | 0 | - | - | - | - | - | - | - | - | - |
| SVOC | 4-Chloro-3-methylphenol | SO | 43 | mg/kg | <0.014 | <0.31 | n.d. | n.d. | n.d. | n.d. | n.d. | 0 | 0 | 0.00 | 0 | 8200 | 0 | 0 | 630 | 0 | 0 | 0.17 |
| SVOC | 4-Chloroaniline | SO | 43 | mg/kg | <0.0081 | <0.18 | n.d. | n.d. | n.d. | n.d. | n.d. | 0 | 0 | 0 | 0 | 11 | 0 | 0 | 2.7 | 0 | 0 | 0.00016 |
| SVOC | 4-Chlorophenyl phenyl ether | SO | 43 | mg/kg | <0.0094 | <0.21 | n.d. | n.d. | n.d. | n.d. | n.d. | 0 | 0 | - | - | - | - | - | - | - | - | - |
| SVOC | 4-Nitroaniline | SO | 43 | mg/kg | <0.012 | <0.27 | n.d. | n.d. | n.d. | n.d. | n.d. | 0 | 0 | 0 | 0 | 110 | 0 | 0 | 25 | 0 | 0 | 0.0016 |
| SVOC | 4-Nitrophenol | SO | 43 | mg/kg | <0.15 | <3.4 | n.d. | n.d. | n.d. | n.d. | n.d. | 0 | 0 | - | - | - | - | - | - | - | - | - |
| SVOC | Acenaphthene | SO | 43 | mg/kg | <0.0076 | 25 | 0.86 | 0.06 | 3.83 | n.d. | 2.70 | 37 | 86 | 0 | 0 | 4500 | 0 | 0 | 360 | 6 | 14 | 0.55 |
| SVOC | Acenaphthylene | SO | 43 | mg/kg | <0.0081 | 0.1 | n.d. | n.d. | n.d. | n.d. | 0.09 | 4 | 9 | - | - | - | - | - | - | - | - | - |
| SVOC | Acetophenone | SO | 43 | mg/kg | <0.0069 | 0.021 | 0.00 | n.d. | 0.01 | n.d. | 0.02 | 10 | 23 | 0 | 0 | 12000 | 0 | 0 | 780 | 0 | 0 | 0.058 |
| SVOC | Anthracene | SO | 43 | mg/kg | <0.03 | 34 | 1.36 | 0.12 | 5.30 | n.d. | 5.77 | 34 | 79 | 0 | 0 | 23000 | 0 | 0 | 1800 | 2 | 5 | 5.8 |
| SVOC | Atrazine | SO | 43 | mg/kg | <0.014 | <0.32 | n.d. | n.d. | n.d. | n.d. | n.d. | 0 | 0 | 0 | 0 | 10 | 0 | 0 | 2.4 | 0 | 0 | 0.0002 |
| SVOC | Benzaldehyde | SO | 43 | mg/kg | <0.024 | 0.032 | n.d. | n.d. | n.d. | n.d. | n.d. | 2 | 5 | 0 | 0 | 820 | 0 | 0 | 170 | 2 | 5 | 0.0041 |
| SVOC | Benzo[a]anthracene | SO | 43 | mg/kg | <0.026 | 48 | 2.88 | 0.57 | 7.86 | n.d. | 12.35 | 40 | 93 | 7.00 | 16 | 2.9 | 31 | 72 | 0.16 | 40 | 93 | 0.0042 |
| SVOC | Benzo[a]pyrene | SO | 43 | mg/kg | <0.01 | 46 | 2.92 | 0.57 | 7.44 | 0.09 | 11.00 | 41 | 95 | 29 | 67 | 0.29 | 41 | 95 | 0.016 | 41 | 95 | 0.004 |
| SVOC | Benzo[b]fluoranthene | SO | 43 | mg/kg | 0.019 | 56 | 3.69 | 1.00 | 9.24 | 0.04 | 12.70 | 43 | 100 | 10 | 23 | 2.9 | 36 | 84 | 0.16 | 40 | 93 | 0.041 |
| SVOC | Benzo[g,h,i]perylene | SO | 43 | mg/kg | <0.019 | 29 | 2.37 | 0.64 | 5.00 | 0.06 | 12.00 | 41 | 95 | - | - | - | - | - | - | - | - | - |
| SVOC | Benzo[k]fluoranthene | SO | 43 | mg/kg | <0.015 | 20 | 1.35 | 0.35 | 3.31 | 0.05 | 4.90 | 41 | 95 | 0.00 | 0 | 29 | 7 | 16 | 1.6 | 20 | 47 | 0.4 |

**Table 13. Operational Area Shallow Soil Analytical Results Statistical Summary**
**Columbia Falls Aluminum Company, LLC, Phase I Site Characterization, 2000 Aluminum Drive, Columbia Falls, MT**

| Group | Analyte | Matrix | No. of Results | Unit | Min | Max | Mean | Median | Standard Deviation | 5th Percentile | 95th Percentile | # > LOD | % > LOD | Industrial RSL | | | Residential RSL | | | Risk SSL | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | | | | | | | No. Exceeding | % Exceeding | Action Level | No. Exceeding | % Exceeding | Action Level | No. Exceeding | % Exceeding | Action Level |
| SVOC | Bis(2-chloroethoxy)methane | SO | 43 | mg/kg | <0.0098 | <0.22 | n.d. | n.d. | n.d. | n.d. | n.d. | 0 | 0 | 0 | 0 | 250 | 0 | 0 | 19 | 0 | 0 | 0.0013 |
| SVOC | Bis(2-chloroethyl)ether | SO | 43 | mg/kg | <0.0074 | <0.17 | n.d. | n.d. | n.d. | n.d. | n.d. | 0 | 0 | 0.00 | 0 | 1 | 0 | 0 | 0.23 | 0 | 0 | 0.0000036 |
| SVOC | Bis(2-ethylhexyl) phthalate | SO | 43 | mg/kg | <0.012 | 0.074 | n.d. | n.d. | n.d. | n.d. | 0.07 | 5 | 12 | 0 | 0 | 160 | 0 | 0 | 39 | 0 | 0 | 1.3 |
| SVOC | Butyl benzyl phthalate | SO | 43 | mg/kg | <0.0097 | 0.088 | n.d. | n.d. | n.d. | n.d. | 0.08 | 6 | 14 | 0 | 0 | 1200 | 0 | 0 | 290 | 0 | 0 | 0.24 |
| SVOC | Caprolactam | SO | 43 | mg/kg | <0.023 | <0.51 | n.d. | n.d. | n.d. | n.d. | n.d. | 0 | 0 | 0 | 0 | 40000 | 0 | 0 | 3100 | 0 | 0 | 0.25 |
| SVOC | Carbazole | SO | 43 | mg/kg | <0.0078 | 21 | 0.84 | 0.09 | 3.26 | n.d. | 2.82 | 38 | 88 | - | - | - | - | - | - | - | - | - |
| SVOC | Chrysene | SO | 43 | mg/kg | 0.013 | 51 | 3.22 | 0.84 | 8.32 | 0.03 | 11.64 | 43 | 100 | 0 | 0 | 290 | 2 | 5 | 16 | 17 | 40 | 1.2 |
| SVOC | Dibenz(a,h)anthracene | SO | 43 | mg/kg | <0.016 | 7.9 | 0.63 | 0.13 | 1.37 | n.d. | 2.85 | 36 | 84 | 17 | 40 | 0.29 | 36 | 84 | 0.016 | 36 | 84 | 0.013 |
| SVOC | Dibenzofuran | SO | 43 | mg/kg | <0.0096 | 9.2 | 0.35 | 0.03 | 1.43 | n.d. | 1.55 | 32 | 74 | 0 | 0 | 100 | 1 | 2 | 7.3 | 29 | 67 | 0.015 |
| SVOC | Diethyl phthalate | SO | 43 | mg/kg | <0.0089 | <0.2 | n.d. | n.d. | n.d. | n.d. | n.d. | 0 | 0 | 0 | 0 | 66000 | 0 | 0 | 5100 | 0 | 0 | 0.61 |
| SVOC | Dimethyl phthalate | SO | 43 | mg/kg | <0.0091 | <0.21 | n.d. | n.d. | n.d. | n.d. | n.d. | 0 | 0 | - | - | - | - | - | - | - | - | - |
| SVOC | Di-n-butyl phthalate | SO | 43 | mg/kg | <0.0094 | 0.055 | 0.01 | n.d. | 0.02 | n.d. | 0.05 | 16 | 37 | 0 | 0 | 8200 | 0 | 0 | 630 | 0 | 0 | 0.23 |
| SVOC | Di-n-octyl phthalate | SO | 43 | mg/kg | <0.016 | <0.36 | n.d. | n.d. | n.d. | n.d. | n.d. | 0 | 0 | 0 | 0 | 820 | 0 | 0 | 63 | 0 | 0 | 5.7 |
| SVOC | Fluoranthene | SO | 43 | mg/kg | 0.014 | 110 | 5.77 | 0.91 | 17.64 | 0.04 | 20.80 | 43 | 100 | 0 | 0 | 3000 | 0 | 0 | 240 | 5 | 12 | 8.9 |
| SVOC | Fluorene | SO | 43 | mg/kg | <0.0069 | 20 | 0.69 | 0.05 | 3.07 | n.d. | 2.10 | 36 | 84 | 0 | 0 | 3000 | 0 | 0 | 240 | 5 | 12 | 0.54 |
| SVOC | Hexachlorobenzene | SO | 43 | mg/kg | <0.013 | <0.29 | n.d. | n.d. | n.d. | n.d. | n.d. | 0 | 0 | 0 | 0 | 0.96 | 0 | 0 | 0.21 | 0 | 0 | 0.00012 |
| SVOC | Hexachlorobutadiene | SO | 43 | mg/kg | <0.0088 | <0.2 | n.d. | n.d. | n.d. | n.d. | n.d. | 0 | 0 | 0 | 0 | 5.3 | 0 | 0 | 1.2 | 0 | 0 | 0.00027 |
| SVOC | Hexachlorocyclopentadiene | SO | 43 | mg/kg | <0.02 | <0.44 | n.d. | n.d. | n.d. | n.d. | n.d. | 0 | 0 | 0 | 0 | 0.75 | 0 | 0 | 0.18 | 0 | 0 | 0.00013 |
| SVOC | Hexachloroethane | SO | 43 | mg/kg | <0.012 | <0.26 | n.d. | n.d. | n.d. | n.d. | n.d. | 0 | 0 | 0.00 | 0 | 8 | 0 | 0 | 1.8 | 0 | 0 | 0.0002 |
| SVOC | Indeno[1,2,3-cd]pyrene | SO | 43 | mg/kg | <0.021 | 32 | 2.50 | 0.57 | 5.43 | n.d. | 11.10 | 40 | 93 | 9 | 21 | 2.9 | 33 | 77 | 0.16 | 34 | 79 | 0.13 |
| SVOC | Isophorone | SO | 43 | mg/kg | <0.0068 | 1.5 | n.d. | n.d. | n.d. | n.d. | 1.24 | 6 | 14 | 0 | 0 | 2400 | 0 | 0 | 570 | 5 | 12 | 0.026 |
| SVOC | Naphthalene | SO | 43 | mg/kg | <0.008 | 5.6 | 0.22 | 0.02 | 0.86 | n.d. | 0.89 | 33 | 77 | 0 | 0 | 17 | 1 | 2 | 3.8 | 33 | 77 | 0.00054 |
| SVOC | Nitrobenzene | SO | 43 | mg/kg | <0.0099 | <0.22 | n.d. | n.d. | n.d. | n.d. | n.d. | 0 | 0 | 0 | 0 | 22 | 0 | 0 | 5.1 | 0 | 0 | 0.000092 |
| SVOC | N-Nitrosodi-n-propylamine | SO | 43 | mg/kg | <0.011 | <0.24 | n.d. | n.d. | n.d. | n.d. | n.d. | 0 | 0 | 0 | 0 | 0.33 | 0 | 0 | 0.078 | 0 | 0 | 0.0000081 |
| SVOC | N-Nitrosodiphenylamine | SO | 43 | mg/kg | <0.029 | <0.65 | n.d. | n.d. | n.d. | n.d. | n.d. | 0 | 0 | 0 | 0 | 470 | 0 | 0 | 110 | 0 | 0 | 0.067 |
| SVOC | Pentachlorophenol | SO | 43 | mg/kg | <0.038 | <0.86 | n.d. | n.d. | n.d. | n.d. | n.d. | 0 | 0 | 0 | 0 | 4 | 0 | 0 | 1 | 0 | 0 | 0.000057 |
| SVOC | Phenanthrene | SO | 43 | mg/kg | <0.01 | 120 | 5.25 | 0.61 | 18.90 | 0.06 | 16.57 | 42 | 98 | - | - | - | - | - | - | - | - | - |
| SVOC | Phenol | SO | 43 | mg/kg | <0.01 | 0.027 | n.d. | n.d. | n.d. | n.d. | 0.03 | 3 | 7 | 0.00 | 0 | 25000 | 0 | 0 | 1900 | 0 | 0 | 0.33 |
| SVOC | Pyrene | SO | 43 | mg/kg | <0.017 | 88 | 5.00 | 1.20 | 14.36 | 0.07 | 14.85 | 42 | 98 | 0 | 0 | 2300 | 0 | 0 | 180 | 18 | 42 | 1.3 |

mg/kg - Milligrams per Kilograms
n.d - Non Detect
LOD - Limit of Detection
Industiral RSL - Environmental Protection Agency Industrial Soil Regional Screening Level
Residential RSL - Environmental Protection Agency Residnetial Soil Regional Screening Level
Risk SSL - Environmental Protection Agency Human Health Protection of Ground Water - Risk-based Soil Screening Level

**Table 14. Drainage Structure Soil Analytical Results Statistical Summary**
**Columbia Falls Aluminum Company, LLC, Phase I Site Characterization, 2000 Aluminum Drive, Columbia Falls, MT**

| Group | Analyte | Matrix | No. of Results | Unit | Min | Max | Mean | Median | Standard Deviation | 5th Percentile | 95th Percentile | # > LOD | % > LOD | Industrial RSL No. Exceeding | Industrial RSL % Exceeding | Industrial RSL Action Level | Residential RSL No. Exceeding | Residential RSL % Exceeding | Residential RSL Action Level | Risk SSL No. Exceeding | Risk SSL % Exceeding | Risk SSL Action Level |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| GENCHEM | Fluoride | SO | 9 | mg/kg | 154 | 896 | 435.11 | 303.00 | 268.10 | 180.00 | 869.60 | 9 | 100 | 0 | 0 | 4700 | 4 | 44 | 310 | 9 | 100 | 12 |
| METALS | Aluminum | SO | 9 | mg/kg | 7810 | 102000 | 49963.33 | 52600.00 | 38450.77 | 8670.00 | 97560.00 | 9 | 100 | 0 | 0 | 110000 | 9 | 100 | 7700 | 9 | 100 | 3000 |
| METALS | Antimony | SO | 9 | mg/kg | <0.39 | 3.3 | 0.65 | n.d. | 1.18 | n.d. | 3.16 | 3 | 33 | 0 | 0 | 47 | 1 | 11 | 3.1 | 3 | 33 | 0.035 |
| METALS | Arsenic | SO | 9 | mg/kg | 1.6 | 25.5 | 7.51 | 5.80 | 7.34 | 1.92 | 19.90 | 9 | 100 | 7 | 78 | 3 | 9 | 100 | 0.68 | 9 | 100 | 0.0015 |
| METALS | Barium | SO | 9 | mg/kg | 50 | 128 | 85.88 | 86.20 | 25.69 | 50.08 | 120.40 | 9 | 100 | 0 | 0 | 22000 | 0 | 0 | 1500 | 9 | 100 | 16 |
| METALS | Beryllium | SO | 9 | mg/kg | 0.43 | 3.4 | 1.26 | 1.30 | 0.91 | 0.43 | 2.64 | 9 | 100 | 0 | 0 | 230 | 0 | 0 | 16 | 1 | 11 | 1.9 |
| METALS | Cadmium | SO | 9 | mg/kg | <0.3 | 3.4 | 1.09 | 1.10 | 1.20 | n.d. | 3.22 | 6 | 67 | 0.00 | 0 | 98 | 0 | 0 | 7.1 | 6 | 67 | 0.069 |
| METALS | Calcium | SO | 9 | mg/kg | 4230 | 35100 | 15266.67 | 11100.00 | 10615.23 | 5066.00 | 32060.00 | 9 | 100 | - | - | - | - | - | - | - | - | - |
| METALS | Chromium | SO | 9 | mg/kg | 6.1 | 40.7 | 18.89 | 14.30 | 11.51 | 6.70 | 35.38 | 9 | 100 | - | - | - | - | - | - | - | - | - |
| METALS | Cobalt | SO | 9 | mg/kg | 3 | 18.1 | 6.80 | 5.10 | 4.48 | 3.44 | 13.94 | 9 | 100 | 0.00 | 0 | 35 | 9 | 100 | 2.3 | 9 | 100 | 0.027 |
| METALS | Copper | SO | 9 | mg/kg | 9.1 | 74.8 | 37.61 | 40.90 | 23.59 | 10.90 | 69.92 | 9 | 100 | 0.00 | 0 | 4700 | 0 | 0 | 310 | 9 | 100 | 2.8 |
| METALS | Cyanide, Total | SO | 9 | mg/kg | <0.023 | 2.4 | 0.60 | 0.20 | 0.88 | n.d. | 2.19 | 8 | 89 | 0.00 | 0 | 15 | 1 | 11 | 2.3 | 8 | 89 | 0.0015 |
| METALS | Iron | SO | 9 | mg/kg | 6870 | 21800 | 14441.11 | 14900.00 | 4859.73 | 8162.00 | 21440.00 | 9 | 100 | 0 | 0 | 82000 | 9 | 100 | 5500 | 9 | 100 | 35 |
| METALS | Lead | SO | 9 | mg/kg | 14 | 249 | 63.97 | 49.00 | 73.12 | 14.04 | 178.08 | 9 | 100 | 0 | 0 | 800 | 0 | 0 | 400 | - | - | - |
| METALS | Magnesium | SO | 9 | mg/kg | 3030 | 11100 | 6903.33 | 7000.00 | 2614.26 | 3486.00 | 10284.00 | 9 | 100 | - | - | - | - | - | - | - | - | - |
| METALS | Manganese | SO | 9 | mg/kg | 110 | 359 | 254.22 | 286.00 | 80.35 | 142.80 | 350.60 | 9 | 100 | 0 | 0 | 2600 | 8 | 89 | 180 | 9 | 100 | 2.8 |
| METALS | Mercury | SO | 9 | mg/kg | <0.012 | 0.059 | 0.03 | 0.03 | 0.02 | n.d. | 0.05 | 7 | 78 | 0 | 0 | 4.6 | 0 | 0 | 1.1 | 7 | 78 | 0.0033 |
| METALS | Nickel | SO | 9 | mg/kg | 9.9 | 754 | 142.58 | 56.50 | 237.17 | 10.66 | 520.80 | 9 | 100 | 0 | 0 | 2200 | 2 | 22 | 150 | 9 | 100 | 2.6 |
| METALS | Potassium | SO | 9 | mg/kg | 499 | 2330 | 983.22 | 944.00 | 554.70 | 504.20 | 1842.00 | 9 | 100 | - | - | - | - | - | - | - | - | - |
| METALS | Selenium | SO | 9 | mg/kg | <0.37 | 1.4 | 0.25 | n.d. | 0.52 | n.d. | 1.37 | 2 | 22 | 0 | 0 | 580 | 0 | 0 | 39 | 2 | 22 | 0.052 |
| METALS | Silver | SO | 9 | mg/kg | <0.72 | 1.8 | 0.29 | n.d. | 0.63 | n.d. | 1.75 | 2 | 22 | 0 | 0 | 580 | 0 | 0 | 39 | 2 | 22 | 0.08 |
| METALS | Sodium | SO | 9 | mg/kg | 45.6 | 7760 | 1816.40 | 1240.00 | 2347.72 | 120.16 | 5556.00 | 9 | 100 | - | - | - | - | - | - | - | - | - |
| METALS | Thallium | SO | 9 | mg/kg | <0.15 | 0.19 | n.d. | n.d. | n.d. | n.d. | 0.19 | 1 | 11 | 0 | 0 | 1.2 | 1 | 11 | 0.078 | 1 | 11 | 0.0014 |
| METALS | Vanadium | SO | 9 | mg/kg | 5.2 | 221 | 49.78 | 23.50 | 67.68 | 6.80 | 158.36 | 9 | 100 | 0 | 0 | 580 | 4 | 44 | 39 | 8 | 89 | 8.6 |
| METALS | Zinc | SO | 9 | mg/kg | 32.5 | 685 | 244.23 | 178.00 | 205.92 | 41.98 | 574.20 | 9 | 100 | 0 | 0 | 35000 | 0 | 0 | 2300 | 8 | 89 | 37 |
| OC_PEST | 4,4'-DDD | SO | 9 | mg/kg | <0.00093 | <0.0012 | n.d. | n.d. | n.d. | n.d. | n.d. | 0 | 0 | 0 | 0 | 9.6 | 0 | 0 | 2.3 | 0 | 0 | 0.0075 |
| OC_PEST | 4,4'-DDE | SO | 9 | mg/kg | <0.001 | <0.0013 | n.d. | n.d. | n.d. | n.d. | n.d. | 0 | 0 | 0 | 0 | 9.3 | 0 | 0 | 2 | 0 | 0 | 0.011 |
| OC_PEST | 4,4'-DDT | SO | 9 | mg/kg | <0.00073 | <0.00094 | n.d. | n.d. | n.d. | n.d. | n.d. | 0 | 0 | 0 | 0 | 8.5 | 0 | 0 | 1.9 | 0 | 0 | 0.077 |
| OC_PEST | Aldrin | SO | 9 | mg/kg | <0.00086 | <0.0011 | n.d. | n.d. | n.d. | n.d. | n.d. | 0 | 0 | 0 | 0 | 0.18 | 0 | 0 | 0.039 | 0 | 0 | 0.00015 |
| OC_PEST | alpha-BHC | SO | 9 | mg/kg | <0.00065 | <0.00083 | n.d. | n.d. | n.d. | n.d. | n.d. | 0 | 0 | 0 | 0 | 0.36 | 0 | 0 | 0.086 | 0 | 0 | 0.000042 |
| OC_PEST | alpha-Chlordane | SO | 9 | mg/kg | <0.0012 | <0.0015 | n.d. | n.d. | n.d. | n.d. | n.d. | 0 | 0 | - | - | - | - | - | - | - | - | - |
| OC_PEST | beta-BHC | SO | 9 | mg/kg | <0.00069 | <0.00088 | n.d. | n.d. | n.d. | n.d. | n.d. | 0 | 0 | 0 | 0 | 1.3 | 0 | 0 | 0.3 | 0 | 0 | 0.00015 |
| OC_PEST | delta-BHC | SO | 9 | mg/kg | <0.00077 | <0.00099 | n.d. | n.d. | n.d. | n.d. | n.d. | 0 | 0 | - | - | - | - | - | - | - | - | - |
| OC_PEST | Dieldrin | SO | 9 | mg/kg | <0.00092 | <0.0012 | n.d. | n.d. | n.d. | n.d. | n.d. | 0 | 0 | 0 | 0 | 0.14 | 0 | 0 | 0.034 | 0 | 0 | 0.000071 |
| OC_PEST | Endosulfan I | SO | 9 | mg/kg | <0.00098 | <0.0013 | n.d. | n.d. | n.d. | n.d. | n.d. | 0 | 0 | - | - | - | - | - | - | - | - | - |
| OC_PEST | Endosulfan II | SO | 9 | mg/kg | <0.0011 | <0.0014 | n.d. | n.d. | n.d. | n.d. | n.d. | 0 | 0 | - | - | - | - | - | - | - | - | - |
| OC_PEST | Endosulfan sulfate | SO | 9 | mg/kg | <0.00083 | <0.0011 | n.d. | n.d. | n.d. | n.d. | n.d. | 0 | 0 | - | - | - | - | - | - | - | - | - |

**Table 14. Drainage Structure Soil Analytical Results Statistical Summary**
**Columbia Falls Aluminum Company, LLC, Phase I Site Characterization, 2000 Aluminum Drive, Columbia Falls, MT**

| | | | | | | | | | | | | | | Industrial RSL | | | Residential RSL | | | Risk SSL | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Group | Analyte | Matrix | No. of Results | Unit | Min | Max | Mean | Median | Standard Deviation | 5th Percentile | 95th Percentile | # > LOD | % > LOD | No. Exceeding | % Exceeding | Action Level | No. Exceeding | % Exceeding | Action Level | No. Exceeding | % Exceeding | Action Level |
| OC_PEST | Endrin | SO | 9 | mg/kg | <0.0009 | <0.0012 | n.d. | n.d. | n.d. | n.d. | n.d. | 0 | 0 | 0 | 0 | 25 | 0 | 0 | 1.9 | 0 | 0 | 0.0092 |
| OC_PEST | Endrin aldehyde | SO | 9 | mg/kg | <0.00088 | <0.0011 | n.d. | n.d. | n.d. | n.d. | n.d. | 0 | 0 | - | - | - | - | - | - | - | - | - |
| OC_PEST | Endrin ketone | SO | 9 | mg/kg | <0.00098 | <0.0013 | n.d. | n.d. | n.d. | n.d. | n.d. | 0 | 0 | - | - | - | - | - | - | - | - | - |
| OC_PEST | gamma-BHC (Lindane) | SO | 9 | mg/kg | <0.00063 | <0.00082 | n.d. | n.d. | n.d. | n.d. | n.d. | 0 | 0 | 0.00 | 0 | 2.5 | 0 | 0 | 0.57 | 0 | 0 | 0.00024 |
| OC_PEST | gamma-Chlordane | SO | 9 | mg/kg | <0.0015 | <0.002 | n.d. | n.d. | n.d. | n.d. | n.d. | 0 | 0 | - | - | - | - | - | - | - | - | - |
| OC_PEST | Heptachlor | SO | 9 | mg/kg | <0.00091 | <0.0012 | n.d. | n.d. | n.d. | n.d. | n.d. | 0 | 0 | 0 | 0 | 0.63 | 0 | 0 | 0.13 | 0 | 0 | 0.00012 |
| OC_PEST | Heptachlor epoxide | SO | 9 | mg/kg | <0.0014 | <0.0018 | n.d. | n.d. | n.d. | n.d. | n.d. | 0 | 0 | 0.00 | 0 | 0.33 | 0 | 0 | 0.07 | 0 | 0 | 0.000028 |
| OC_PEST | Methoxychlor | SO | 9 | mg/kg | <0.0015 | <0.0019 | n.d. | n.d. | n.d. | n.d. | n.d. | 0 | 0 | 0 | 0 | 410 | 0 | 0 | 32 | 0 | 0 | 0.2 |
| OC_PEST | Toxaphene | SO | 9 | mg/kg | <0.021 | <0.027 | n.d. | n.d. | n.d. | n.d. | n.d. | 0 | 0 | 0.00 | 0 | 2.1 | 0 | 0 | 0.49 | 0 | 0 | 0.011 |
| PCB | Aroclor 1016 | SO | 9 | mg/kg | <0.0094 | <0.012 | n.d. | n.d. | n.d. | n.d. | n.d. | 0 | 0 | 0 | 0 | 5.1 | 0 | 0 | 0.41 | 0 | 0 | 0.013 |
| PCB | Aroclor 1221 | SO | 9 | mg/kg | <0.0094 | <0.012 | n.d. | n.d. | n.d. | n.d. | n.d. | 0 | 0 | 0.00 | 0 | 0.83 | 0 | 0 | 0.2 | 0 | 0 | 0.00008 |
| PCB | Aroclor 1232 | SO | 9 | mg/kg | <0.0094 | <0.012 | n.d. | n.d. | n.d. | n.d. | n.d. | 0 | 0 | 0 | 0 | 0.72 | 0 | 0 | 0.17 | 0 | 0 | 0.00008 |
| PCB | Aroclor 1242 | SO | 9 | mg/kg | <0.0094 | <0.012 | n.d. | n.d. | n.d. | n.d. | n.d. | 0 | 0 | 0 | 0 | 0.95 | 0 | 0 | 0.23 | 0 | 0 | 0.0012 |
| PCB | Aroclor 1248 | SO | 9 | mg/kg | <0.0094 | <0.012 | n.d. | n.d. | n.d. | n.d. | n.d. | 0 | 0 | 0 | 0 | 0.95 | 0 | 0 | 0.23 | 0 | 0 | 0.0012 |
| PCB | Aroclor 1254 | SO | 9 | mg/kg | <0.0097 | <0.013 | n.d. | n.d. | n.d. | n.d. | n.d. | 0 | 0 | 0 | 0 | 0.97 | 0 | 0 | 0.12 | 0 | 0 | 0.002 |
| PCB | Aroclor 1260 | SO | 9 | mg/kg | <0.0097 | <0.013 | n.d. | n.d. | n.d. | n.d. | n.d. | 0 | 0 | 0 | 0 | 0.99 | 0 | 0 | 0.24 | 0 | 0 | 0.0055 |
| PCB | Aroclor 1268 | SO | 9 | mg/kg | <0.0097 | <0.013 | n.d. | n.d. | n.d. | n.d. | n.d. | 0 | 0 | - | - | - | - | - | - | - | - | - |
| PCB | Aroclor-1262 | SO | 9 | mg/kg | <0.0097 | <0.013 | n.d. | n.d. | n.d. | n.d. | n.d. | 0 | 0 | - | - | - | - | - | - | - | - | - |
| PCB | Polychlorinated biphenyls, Total | SO | 9 | mg/kg | <0.0097 | <0.013 | n.d. | n.d. | n.d. | n.d. | n.d. | 0 | 0 | 0.00 | 0 | 0.94 | 0 | 0 | 0.23 | 0 | 0 | 0.0068 |
| SVOC | 1,1'-Biphenyl | SO | 9 | mg/kg | <0.03 | <0.19 | n.d. | n.d. | n.d. | n.d. | n.d. | 0 | 0 | 0 | 0 | 20 | 0 | 0 | 4.7 | 0 | 0 | 0.00087 |
| SVOC | 1,2,4,5-Tetrachlorobenzene | SO | 9 | mg/kg | <0.026 | <0.17 | n.d. | n.d. | n.d. | n.d. | n.d. | 0 | 0 | 0 | 0 | 35 | 0 | 0 | 2.3 | 0 | 0 | 0.00079 |
| SVOC | 1,4-Dioxane | SO | 9 | mg/kg | <0.093 | <0.6 | n.d. | n.d. | n.d. | n.d. | n.d. | 0 | 0 | 0 | 0 | 24 | 0 | 0 | 5.3 | 0 | 0 | 0.000094 |
| SVOC | 2,2'-oxybis[1-chloropropane] | SO | 9 | mg/kg | <0.014 | <0.092 | n.d. | n.d. | n.d. | n.d. | n.d. | 0 | 0 | 0 | 0 | 4700 | 0 | 0 | 310 | 0 | 0 | 0.026 |
| SVOC | 2,3,4,6-Tetrachlorophenol | SO | 9 | mg/kg | <0.033 | <0.21 | n.d. | n.d. | n.d. | n.d. | n.d. | 0 | 0 | 0 | 0 | 2500 | 0 | 0 | 190 | 0 | 0 | 0.018 |
| SVOC | 2,4,5-Trichlorophenol | SO | 9 | mg/kg | <0.035 | <0.22 | n.d. | n.d. | n.d. | n.d. | n.d. | 0 | 0 | 0 | 0 | 8200 | 0 | 0 | 630 | 0 | 0 | 0.4 |
| SVOC | 2,4,6-Trichlorophenol | SO | 9 | mg/kg | <0.0099 | <0.064 | n.d. | n.d. | n.d. | n.d. | n.d. | 0 | 0 | 0.00 | 0 | 82 | 0 | 0 | 6.3 | 0 | 0 | 0.0012 |
| SVOC | 2,4-Dichlorophenol | SO | 9 | mg/kg | <0.0082 | <0.053 | n.d. | n.d. | n.d. | n.d. | n.d. | 0 | 0 | 0 | 0 | 250 | 0 | 0 | 19 | 0 | 0 | 0.0023 |
| SVOC | 2,4-Dimethylphenol | SO | 9 | mg/kg | <0.077 | <0.49 | n.d. | n.d. | n.d. | n.d. | n.d. | 0 | 0 | 0 | 0 | 1600 | 0 | 0 | 130 | 0 | 0 | 0.042 |
| SVOC | 2,4-Dinitrophenol | SO | 9 | mg/kg | <0.26 | <1.7 | n.d. | n.d. | n.d. | n.d. | n.d. | 0 | 0 | 0 | 0 | 160 | 0 | 0 | 13 | 0 | 0 | 0.0044 |
| SVOC | 2,4-Dinitrotoluene | SO | 9 | mg/kg | <0.014 | <0.089 | n.d. | n.d. | n.d. | n.d. | n.d. | 0 | 0 | 0 | 0 | 7.4 | 0 | 0 | 1.7 | 0 | 0 | 0.00032 |
| SVOC | 2,6-Dinitrotoluene | SO | 9 | mg/kg | <0.019 | <0.12 | n.d. | n.d. | n.d. | n.d. | n.d. | 0 | 0 | 0.00 | 0 | 1.5 | 0 | 0 | 0.36 | 0 | 0 | 0.000067 |
| SVOC | 2-Chloronaphthalene | SO | 9 | mg/kg | <0.0079 | <0.051 | n.d. | n.d. | n.d. | n.d. | n.d. | 0 | 0 | 0 | 0 | 6000 | 0 | 0 | 480 | 0 | 0 | 0.39 |
| SVOC | 2-Chlorophenol | SO | 9 | mg/kg | <0.0089 | <0.057 | n.d. | n.d. | n.d. | n.d. | n.d. | 0 | 0 | 0 | 0 | 580 | 0 | 0 | 39 | 0 | 0 | 0.0089 |
| SVOC | 2-Methylnaphthalene | SO | 9 | mg/kg | <0.0077 | 1.3 | 0.34 | 0.22 | 0.42 | n.d. | 1.11 | 7 | 78 | 0.00 | 0 | 300 | 0 | 0 | 24 | 7 | 78 | 0.019 |
| SVOC | 2-Methylphenol | SO | 9 | mg/kg | <0.015 | <0.098 | n.d. | n.d. | n.d. | n.d. | n.d. | 0 | 0 | 0 | 0 | 4100 | 0 | 0 | 320 | 0 | 0 | 0.075 |
| SVOC | 2-Nitroaniline | SO | 9 | mg/kg | <0.012 | <0.074 | n.d. | n.d. | n.d. | n.d. | n.d. | 0 | 0 | 0 | 0 | 800 | 0 | 0 | 63 | 0 | 0 | 0.008 |
| SVOC | 2-Nitrophenol | SO | 9 | mg/kg | <0.012 | <0.075 | n.d. | n.d. | n.d. | n.d. | n.d. | 0 | 0 | - | - | - | - | - | - | - | - | - |

**Table 14. Drainage Structure Soil Analytical Results Statistical Summary**
**Columbia Falls Aluminum Company, LLC, Phase I Site Characterization, 2000 Aluminum Drive, Columbia Falls, MT**

| | | | | | | | | | | | | | | Industrial RSL | | | Residential RSL | | | Risk SSL | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Group | Analyte | Matrix | No. of Results | Unit | Min | Max | Mean | Median | Standard Deviation | 5th Percentile | 95th Percentile | # > LOD | % > LOD | No. Exceeding | % Exceeding | Action Level | No. Exceeding | % Exceeding | Action Level | No. Exceeding | % Exceeding | Action Level |
| SVOC | 3 & 4 Methylphenol | SO | 9 | mg/kg | <0.0093 | <0.06 | n.d. | n.d. | n.d. | n.d. | n.d. | 0 | 0 | - | - | - | - | - | - | - | - | - |
| SVOC | 3,3'-Dichlorobenzidine | SO | 9 | mg/kg | <0.039 | <0.25 | n.d. | n.d. | n.d. | n.d. | n.d. | 0 | 0 | 0 | 0 | 5.1 | 0 | 0 | 1.2 | 0 | 0 | 0.00082 |
| SVOC | 3-Nitroaniline | SO | 9 | mg/kg | <0.01 | <0.067 | n.d. | n.d. | n.d. | n.d. | n.d. | 0 | 0 | - | - | - | - | - | - | - | - | - |
| SVOC | 4,6-Dinitro-2-methylphenol | SO | 9 | mg/kg | <0.093 | <0.6 | n.d. | n.d. | n.d. | n.d. | n.d. | 0 | 0 | 0 | 0 | 6.6 | 0 | 0 | 0.51 | 0 | 0 | 0.00026 |
| SVOC | 4-Bromophenyl phenyl ether | SO | 9 | mg/kg | <0.011 | <0.071 | n.d. | n.d. | n.d. | n.d. | n.d. | 0 | 0 | - | - | - | - | - | - | - | - | - |
| SVOC | 4-Chloro-3-methylphenol | SO | 9 | mg/kg | <0.015 | <0.097 | n.d. | n.d. | n.d. | n.d. | n.d. | 0 | 0 | 0 | 0 | 8200 | 0 | 0 | 630 | 0 | 0 | 0.17 |
| SVOC | 4-Chloroaniline | SO | 9 | mg/kg | <0.009 | <0.058 | n.d. | n.d. | n.d. | n.d. | n.d. | 0 | 0 | 0 | 0 | 11 | 0 | 0 | 2.7 | 0 | 0 | 0.00016 |
| SVOC | 4-Chlorophenyl phenyl ether | SO | 9 | mg/kg | <0.01 | <0.067 | n.d. | n.d. | n.d. | n.d. | n.d. | 0 | 0 | - | - | - | - | - | - | - | - | - |
| SVOC | 4-Nitroaniline | SO | 9 | mg/kg | <0.013 | <0.085 | n.d. | n.d. | n.d. | n.d. | n.d. | 0 | 0 | 0 | 0 | 110 | 0 | 0 | 25 | 0 | 0 | 0.0016 |
| SVOC | 4-Nitrophenol | SO | 9 | mg/kg | <0.17 | <1.1 | n.d. | n.d. | n.d. | n.d. | n.d. | 0 | 0 | - | - | - | - | - | - | - | - | - |
| SVOC | Acenaphthene | SO | 9 | mg/kg | 0.0096 | 5.7 | 1.81 | 0.99 | 2.06 | 0.02 | 5.22 | 9 | 100 | 0.00 | 0 | 4500 | 0 | 0 | 360 | 6 | 67 | 0.55 |
| SVOC | Acenaphthylene | SO | 9 | mg/kg | <0.009 | 0.11 | 0.02 | n.d. | 0.04 | n.d. | 0.11 | 2 | 22 | - | - | - | - | - | - | - | - | - |
| SVOC | Acetophenone | SO | 9 | mg/kg | <0.0076 | <0.049 | n.d. | n.d. | n.d. | n.d. | n.d. | 0 | 0 | 0.00 | 0 | 12000 | 0 | 0 | 780 | 0 | 0 | 0.058 |
| SVOC | Anthracene | SO | 9 | mg/kg | <0.033 | 22 | 5.03 | 2.60 | 7.13 | n.d. | 17.80 | 8 | 89 | 0 | 0 | 23000 | 0 | 0 | 1800 | 2 | 22 | 5.8 |
| SVOC | Atrazine | SO | 9 | mg/kg | <0.016 | <0.1 | n.d. | n.d. | n.d. | n.d. | n.d. | 0 | 0 | 0 | 0 | 10 | 0 | 0 | 2.4 | 0 | 0 | 0.0002 |
| SVOC | Benzaldehyde | SO | 9 | mg/kg | <0.027 | <0.17 | n.d. | n.d. | n.d. | n.d. | n.d. | 0 | 0 | 0 | 0 | 820 | 0 | 0 | 170 | 0 | 0 | 0.0041 |
| SVOC | Benzo[a]anthracene | SO | 9 | mg/kg | 0.16 | 130 | 30.40 | 11.00 | 44.36 | 0.20 | 107.60 | 9 | 100 | 6 | 67 | 2.9 | 8 | 89 | 0.16 | 9 | 100 | 0.0042 |
| SVOC | Benzo[a]pyrene | SO | 9 | mg/kg | 0.17 | 80 | 24.89 | 13.00 | 30.10 | 0.24 | 74.80 | 9 | 100 | 8 | 89 | 0.29 | 9 | 100 | 0.016 | 9 | 100 | 0.004 |
| SVOC | Benzo[b]fluoranthene | SO | 9 | mg/kg | 0.26 | 160 | 43.15 | 18.00 | 55.78 | 0.41 | 136.00 | 9 | 100 | 6.00 | 67 | 2.9 | 9 | 100 | 0.16 | 9 | 100 | 0.041 |
| SVOC | Benzo[g,h,i]perylene | SO | 9 | mg/kg | 0.14 | 76 | 25.16 | 12.00 | 27.71 | 0.27 | 66.80 | 9 | 100 | - | - | - | - | - | - | - | - | - |
| SVOC | Benzo[k]fluoranthene | SO | 9 | mg/kg | 0.11 | 62 | 15.66 | 7.10 | 21.15 | 0.12 | 52.00 | 9 | 100 | 2 | 22 | 29 | 6 | 67 | 1.6 | 7 | 78 | 0.4 |
| SVOC | Bis(2-chloroethoxy)methane | SO | 9 | mg/kg | <0.011 | <0.07 | n.d. | n.d. | n.d. | n.d. | n.d. | 0 | 0 | 0 | 0 | 250 | 0 | 0 | 19 | 0 | 0 | 0.0013 |
| SVOC | Bis(2-chloroethyl)ether | SO | 9 | mg/kg | <0.0082 | <0.053 | n.d. | n.d. | n.d. | n.d. | n.d. | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0.23 | 0 | 0 | 0.0000036 |
| SVOC | Bis(2-ethylhexyl) phthalate | SO | 9 | mg/kg | <0.014 | 4.1 | 1.10 | n.d. | 1.76 | n.d. | 4.09 | 4 | 44 | 0 | 0 | 160 | 0 | 0 | 39 | 3 | 33 | 1.3 |
| SVOC | Butyl benzyl phthalate | SO | 9 | mg/kg | <0.011 | 3.3 | 0.51 | n.d. | 1.13 | n.d. | 3.20 | 2 | 22 | 0.00 | 0 | 1200 | 0 | 0 | 290 | 2 | 22 | 0.24 |
| SVOC | Caprolactam | SO | 9 | mg/kg | <0.025 | <0.16 | n.d. | n.d. | n.d. | n.d. | n.d. | 0 | 0 | 0 | 0 | 40000 | 0 | 0 | 3100 | 0 | 0 | 0.25 |
| SVOC | Carbazole | SO | 9 | mg/kg | 0.025 | 32 | 6.11 | 2.70 | 10.15 | 0.04 | 22.32 | 9 | 100 | - | - | - | - | - | - | - | - | - |
| SVOC | Chrysene | SO | 9 | mg/kg | 0.25 | 330 | 62.64 | 17.00 | 106.78 | 0.29 | 242.00 | 9 | 100 | 1 | 11 | 290 | 5 | 56 | 16 | 7 | 78 | 1.2 |
| SVOC | Dibenz(a,h)anthracene | SO | 9 | mg/kg | 0.032 | 23 | 7.66 | 3.80 | 8.95 | 0.06 | 21.80 | 9 | 100 | 7 | 78 | 0.29 | 9 | 100 | 0.016 | 9 | 100 | 0.013 |
| SVOC | Dibenzofuran | SO | 9 | mg/kg | <0.011 | 3.6 | 0.89 | 0.59 | 1.13 | n.d. | 2.83 | 8 | 89 | 0.00 | 0 | 100 | 0 | 0 | 7.3 | 7 | 78 | 0.015 |
| SVOC | Diethyl phthalate | SO | 9 | mg/kg | <0.0099 | <0.064 | n.d. | n.d. | n.d. | n.d. | n.d. | 0 | 0 | 0 | 0 | 66000 | 0 | 0 | 5100 | 0 | 0 | 0.61 |
| SVOC | Dimethyl phthalate | SO | 9 | mg/kg | <0.01 | <0.065 | n.d. | n.d. | n.d. | n.d. | n.d. | 0 | 0 | - | - | - | - | - | - | - | - | - |
| SVOC | Di-n-butyl phthalate | SO | 9 | mg/kg | <0.01 | 1.9 | 0.24 | n.d. | 0.63 | n.d. | 1.74 | 3 | 33 | 0 | 0 | 8200 | 0 | 0 | 630 | 2 | 22 | 0.23 |
| SVOC | Di-n-octyl phthalate | SO | 9 | mg/kg | <0.018 | <0.11 | n.d. | n.d. | n.d. | n.d. | n.d. | 0 | 0 | 0 | 0 | 820 | 0 | 0 | 63 | 0 | 0 | 5.7 |
| SVOC | Fluoranthene | SO | 9 | mg/kg | 0.34 | 470 | 81.78 | 26.00 | 150.50 | 0.41 | 326.00 | 9 | 100 | 0 | 0 | 3000 | 1 | 11 | 240 | 6 | 67 | 8.9 |
| SVOC | Fluorene | SO | 9 | mg/kg | 0.012 | 8.2 | 1.86 | 1.00 | 2.70 | 0.02 | 6.56 | 9 | 100 | 0 | 0 | 3000 | 0 | 0 | 240 | 5 | 56 | 0.54 |
| SVOC | Hexachlorobenzene | SO | 9 | mg/kg | <0.014 | <0.091 | n.d. | n.d. | n.d. | n.d. | n.d. | 0 | 0 | 0 | 0 | 0.96 | 0 | 0 | 0.21 | 0 | 0 | 0.00012 |

**Table 14. Drainage Structure Soil Analytical Results Statistical Summary**
**Columbia Falls Aluminum Company, LLC, Phase I Site Characterization, 2000 Aluminum Drive, Columbia Falls, MT**

| | | | | | | | | | | | | | | Industrial RSL | | | Residential RSL | | | Risk SSL | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Group | Analyte | Matrix | No. of Results | Unit | Min | Max | Mean | Median | Standard Deviation | 5th Percentile | 95th Percentile | # > LOD | % > LOD | No. Exceeding | % Exceeding | Action Level | No. Exceeding | % Exceeding | Action Level | No. Exceeding | % Exceeding | Action Level |
| SVOC | Hexachlorobutadiene | SO | 9 | mg/kg | <0.0098 | <0.063 | n.d. | n.d. | n.d. | n.d. | n.d. | 0 | 0 | 0 | 0 | 5.3 | 0 | 0 | 1.2 | 0 | 0 | 0.00027 |
| SVOC | Hexachlorocyclopentadiene | SO | 9 | mg/kg | <0.022 | <0.14 | n.d. | n.d. | n.d. | n.d. | n.d. | 0 | 0 | 0 | 0 | 0.75 | 0 | 0 | 0.18 | 0 | 0 | 0.00013 |
| SVOC | Hexachloroethane | SO | 9 | mg/kg | <0.013 | <0.082 | n.d. | n.d. | n.d. | n.d. | n.d. | 0 | 0 | 0 | 0 | 8 | 0 | 0 | 1.8 | 0 | 0 | 0.0002 |
| SVOC | Indeno[1,2,3-cd]pyrene | SO | 9 | mg/kg | 0.14 | 83 | 27.95 | 14.00 | 30.95 | 0.26 | 74.60 | 9 | 100 | 6 | 67 | 2.9 | 8 | 89 | 0.16 | 9 | 100 | 0.13 |
| SVOC | Isophorone | SO | 9 | mg/kg | <0.0075 | <0.048 | n.d. | n.d. | n.d. | n.d. | n.d. | 0 | 0 | 0 | 0 | 2400 | 0 | 0 | 570 | 0 | 0 | 0.026 |
| SVOC | Naphthalene | SO | 9 | mg/kg | <0.0089 | 4.6 | 0.87 | 0.50 | 1.46 | n.d. | 3.73 | 6 | 67 | 0 | 0 | 17 | 1 | 11 | 3.8 | 6 | 67 | 0.00054 |
| SVOC | Nitrobenzene | SO | 9 | mg/kg | <0.011 | <0.071 | n.d. | n.d. | n.d. | n.d. | n.d. | 0 | 0 | 0 | 0 | 22 | 0 | 0 | 5.1 | 0 | 0 | 0.000092 |
| SVOC | N-Nitrosodi-n-propylamine | SO | 9 | mg/kg | <0.012 | <0.075 | n.d. | n.d. | n.d. | n.d. | n.d. | 0 | 0 | 0.00 | 0 | 0.33 | 0 | 0 | 0.078 | 0 | 0 | 0.0000081 |
| SVOC | N-Nitrosodiphenylamine | SO | 9 | mg/kg | <0.032 | <0.2 | n.d. | n.d. | n.d. | n.d. | n.d. | 0 | 0 | 0 | 0 | 470 | 0 | 0 | 110 | 0 | 0 | 0.067 |
| SVOC | Pentachlorophenol | SO | 9 | mg/kg | <0.042 | <0.27 | n.d. | n.d. | n.d. | n.d. | n.d. | 0 | 0 | 0 | 0 | 4 | 0 | 0 | 1 | 0 | 0 | 0.000057 |
| SVOC | Phenanthrene | SO | 9 | mg/kg | 0.17 | 130 | 28.15 | 12.00 | 42.53 | 0.22 | 101.60 | 9 | 100 | - | - | - | - | - | - | - | - | - |
| SVOC | Phenol | SO | 9 | mg/kg | <0.011 | <0.073 | n.d. | n.d. | n.d. | n.d. | n.d. | 0 | 0 | 0 | 0 | 25000 | 0 | 0 | 1900 | 0 | 0 | 0.33 |
| SVOC | Pyrene | SO | 9 | mg/kg | 0.36 | 340 | 63.82 | 18.00 | 110.37 | 0.41 | 252.00 | 9 | 100 | 0 | 0 | 2300 | 1 | 11 | 180 | 7 | 78 | 1.3 |
| VOC | 1,1,1-Trichloroethane | SO | 9 | mg/kg | <0.00023 | <0.00052 | n.d. | n.d. | n.d. | n.d. | n.d. | 0 | 0 | 0 | 0 | 3600 | 0 | 0 | 810 | 0 | 0 | 0.28 |
| VOC | 1,1,2,2-Tetrachloroethane | SO | 9 | mg/kg | <0.00011 | <0.00023 | n.d. | n.d. | n.d. | n.d. | n.d. | 0 | 0 | 0 | 0 | 2.7 | 0 | 0 | 0.6 | 0 | 0 | 0.00003 |
| VOC | 1,1,2-Trichloro-1,2,2-trifluoroethane | SO | 9 | mg/kg | <0.00027 | <0.0006 | n.d. | n.d. | n.d. | n.d. | n.d. | 0 | 0 | 0 | 0 | 17000 | 0 | 0 | 4000 | 0 | 0 | 14 |
| VOC | 1,1,2-Trichloroethane | SO | 9 | mg/kg | <0.00017 | <0.00038 | n.d. | n.d. | n.d. | n.d. | n.d. | 0 | 0 | 0 | 0 | 0.63 | 0 | 0 | 0.15 | 0 | 0 | 0.000013 |
| VOC | 1,1-Dichloroethane | SO | 9 | mg/kg | <0.00021 | <0.00047 | n.d. | n.d. | n.d. | n.d. | n.d. | 0 | 0 | 0 | 0 | 16 | 0 | 0 | 3.6 | 0 | 0 | 0.00078 |
| VOC | 1,1-Dichloroethene | SO | 9 | mg/kg | <0.00025 | <0.00056 | n.d. | n.d. | n.d. | n.d. | n.d. | 0 | 0 | 0 | 0 | 100 | 0 | 0 | 23 | 0 | 0 | 0.01 |
| VOC | 1,2,3-Trichlorobenzene | SO | 9 | mg/kg | <6.8E-05 | <0.00015 | n.d. | n.d. | n.d. | n.d. | n.d. | 0 | 0 | 0 | 0 | 93 | 0 | 0 | 6.3 | 0 | 0 | 0.0021 |
| VOC | 1,2,4-Trichlorobenzene | SO | 9 | mg/kg | <0.0002 | <0.00044 | n.d. | n.d. | n.d. | n.d. | n.d. | 0 | 0 | 0 | 0 | 26 | 0 | 0 | 5.8 | 0 | 0 | 0.0012 |
| VOC | 1,2-Dibromo-3-Chloropropane | SO | 9 | mg/kg | <0.00029 | <0.00065 | n.d. | n.d. | n.d. | n.d. | n.d. | 0 | 0 | 0 | 0 | 0.064 | 0 | 0 | 0.0053 | 0 | 0 | 0.00000014 |
| VOC | 1,2-Dichlorobenzene | SO | 9 | mg/kg | <0.00012 | 0.00065 | 0.00 | n.d. | 0.00 | n.d. | 0.00 | 2 | 22 | 0 | 0 | 930 | 0 | 0 | 180 | 0 | 0 | 0.03 |
| VOC | 1,2-Dichloroethane | SO | 9 | mg/kg | <6.8E-05 | <0.00015 | n.d. | n.d. | n.d. | n.d. | n.d. | 0 | 0 | 0 | 0 | 2 | 0 | 0 | 0.46 | 0 | 0 | 0.000048 |
| VOC | 1,2-Dichloropropane | SO | 9 | mg/kg | <0.00011 | <0.00023 | n.d. | n.d. | n.d. | n.d. | n.d. | 0 | 0 | 0 | 0 | 4.4 | 0 | 0 | 1 | 0 | 0 | 0.00015 |
| VOC | 1,3-Dichlorobenzene | SO | 9 | mg/kg | <7.4E-05 | <0.00016 | n.d. | n.d. | n.d. | n.d. | n.d. | 0 | 0 | - | - | - | - | - | - | - | - | - |
| VOC | 1,4-Dichlorobenzene | SO | 9 | mg/kg | <0.00011 | 0.00016 | n.d. | n.d. | n.d. | n.d. | 0.00 | 1 | 11 | 0 | 0 | 11 | 0 | 0 | 2.6 | 0 | 0 | 0.00046 |
| VOC | 2-Butanone (MEK) | SO | 9 | mg/kg | <0.051 | 0.022 | 0.01 | 0.01 | 0.01 | n.d. | 0.02 | 8 | 89 | 0.00 | 0 | 19000 | 0 | 0 | 2700 | 0 | 0 | 0.12 |
| VOC | 2-Hexanone | SO | 9 | mg/kg | <0.00058 | 0.0013 | n.d. | n.d. | n.d. | n.d. | - | 1 | 11 | 0 | 0 | 130 | 0 | 0 | 20 | 1 | 11 | 0.00088 |
| VOC | 4-Methyl-2-pentanone (MIBK) | SO | 9 | mg/kg | <0.0014 | 0.0065 | 0.00 | n.d. | 0.00 | n.d. | 0.01 | 2 | 22 | 0 | 0 | 14000 | 0 | 0 | 3300 | 0 | 0 | 0.14 |
| VOC | Acetone | SO | 9 | mg/kg | <0.025 | 0.18 | 0.06 | 0.05 | 0.06 | n.d. | 0.16 | 8 | 89 | 0.00 | 0 | 67000 | 0 | 0 | 6100 | 0 | 0 | 0.29 |
| VOC | Benzene | SO | 9 | mg/kg | <0.00025 | 0.0011 | 0.00 | 0.00 | 0.00 | n.d. | 0.00 | 7 | 78 | 0.00 | 0 | 5.1 | 0 | 0 | 1.2 | 7 | 78 | 0.00023 |
| VOC | Bromoform | SO | 9 | mg/kg | <8E-05 | <0.00018 | n.d. | n.d. | n.d. | n.d. | n.d. | 0 | 0 | 0 | 0 | 86 | 0 | 0 | 19 | 0 | 0 | 0.00087 |
| VOC | Bromomethane | SO | 9 | mg/kg | <0.0002 | <0.00044 | n.d. | n.d. | n.d. | n.d. | n.d. | 0 | 0 | 0 | 0 | 3 | 0 | 0 | 0.68 | 0 | 0 | 0.00019 |
| VOC | Carbon disulfide | SO | 9 | mg/kg | <0.00037 | 0.006 | 0.00 | 0.00 | 0.00 | n.d. | 0.01 | 5 | 56 | 0 | 0 | 350 | 0 | 0 | 77 | 0 | 0 | 0.024 |
| VOC | Carbon tetrachloride | SO | 9 | mg/kg | <0.00027 | <0.00059 | n.d. | n.d. | n.d. | n.d. | n.d. | 0 | 0 | 0.00 | 0 | 2.9 | 0 | 0 | 0.65 | 0 | 0 | 0.00018 |
| VOC | Chlorobenzene | SO | 9 | mg/kg | <8.7E-05 | <0.00019 | n.d. | n.d. | n.d. | n.d. | n.d. | 0 | 0 | 0 | 0 | 130 | 0 | 0 | 28 | 0 | 0 | 0.0053 |

**Table 14. Drainage Structure Soil Analytical Results Statistical Summary**
**Columbia Falls Aluminum Company, LLC, Phase I Site Characterization, 2000 Aluminum Drive, Columbia Falls, MT**

| Group | Analyte | Matrix | No. of Results | Unit | Min | Max | Mean | Median | Standard Deviation | 5th Percentile | 95th Percentile | # > LOD | % > LOD | Industrial RSL No. Exceeding | Industrial RSL % Exceeding | Industrial RSL Action Level | Residential RSL No. Exceeding | Residential RSL % Exceeding | Residential RSL Action Level | Risk SSL No. Exceeding | Risk SSL % Exceeding | Risk SSL Action Level |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| VOC | Chlorobromomethane | SO | 9 | mg/kg | <0.00011 | <0.00023 | n.d. | n.d. | n.d. | n.d. | n.d. | 0 | 0 | 0 | 0 | 63 | 0 | 0 | 15 | 0 | 0 | 0.0021 |
| VOC | Chlorodibromomethane | SO | 9 | mg/kg | <9.3E-05 | <0.00021 | n.d. | n.d. | n.d. | n.d. | n.d. | 0 | 0 | 0 | 0 | 39 | 0 | 0 | 8.3 | 0 | 0 | 0.00023 |
| VOC | Chloroethane | SO | 9 | mg/kg | <0.00022 | <0.00048 | n.d. | n.d. | n.d. | n.d. | n.d. | 0 | 0 | 0 | 0 | 5700 | 0 | 0 | 1400 | 0 | 0 | 0.59 |
| VOC | Chloroform | SO | 9 | mg/kg | <0.00013 | <0.00029 | n.d. | n.d. | n.d. | n.d. | n.d. | 0 | 0 | 0 | 0 | 1.4 | 0 | 0 | 0.32 | 0 | 0 | 0.000061 |
| VOC | Chloromethane | SO | 9 | mg/kg | <0.00023 | <0.00052 | n.d. | n.d. | n.d. | n.d. | n.d. | 0 | 0 | 0 | 0 | 46 | 0 | 0 | 11 | 0 | 0 | 0.0049 |
| VOC | cis-1,2-Dichloroethene | SO | 9 | mg/kg | <0.00014 | <0.0003 | n.d. | n.d. | n.d. | n.d. | n.d. | 0 | 0 | 0 | 0 | 230 | 0 | 0 | 16 | 0 | 0 | 0.0011 |
| VOC | cis-1,3-Dichloropropene | SO | 9 | mg/kg | <9.3E-05 | <0.00021 | n.d. | n.d. | n.d. | n.d. | n.d. | 0 | 0 | - | - | - | - | - | - | - | - | - |
| VOC | Cyclohexane | SO | 9 | mg/kg | <0.00028 | 0.001 | 0.00 | n.d. | 0.00 | n.d. | 0.00 | 2 | 22 | 0 | 0 | 2700 | 0 | 0 | 650 | 0 | 0 | 1.3 |
| VOC | Dichlorobromomethane | SO | 9 | mg/kg | <0.00023 | <0.00052 | n.d. | n.d. | n.d. | n.d. | n.d. | 0 | 0 | 0.00 | 0 | 1.3 | 0 | 0 | 0.29 | 0 | 0 | 0.000036 |
| VOC | Dichlorodifluoromethane | SO | 9 | mg/kg | <0.0002 | <0.00044 | n.d. | n.d. | n.d. | n.d. | n.d. | 0 | 0 | 0 | 0 | 37 | 0 | 0 | 8.7 | 0 | 0 | 0.03 |
| VOC | Ethylbenzene | SO | 9 | mg/kg | <0.00011 | 0.095 | 0.01 | n.d. | 0.03 | n.d. | 0.08 | 4 | 44 | 0 | 0 | 25 | 0 | 0 | 5.8 | 1 | 11 | 0.0017 |
| VOC | Ethylene Dibromide | SO | 9 | mg/kg | <7.4E-05 | <0.00016 | n.d. | n.d. | n.d. | n.d. | n.d. | 0 | 0 | 0 | 0 | 0.16 | 0 | 0 | 0.036 | 0 | 0 | 0.0000021 |
| VOC | Isopropylbenzene | SO | 9 | mg/kg | <0.00011 | <0.00023 | n.d. | n.d. | n.d. | n.d. | n.d. | 0 | 0 | 0 | 0 | 990 | 0 | 0 | 190 | 0 | 0 | 0.074 |
| VOC | Methyl acetate | SO | 9 | mg/kg | <0.00078 | 0.0072 | 0.00 | n.d. | 0.00 | n.d. | 0.01 | 4 | 44 | 0 | 0 | 120000 | 0 | 0 | 7800 | 0 | 0 | 0.41 |
| VOC | Methyl tert-butyl ether | SO | 9 | mg/kg | <0.00011 | <0.00023 | n.d. | n.d. | n.d. | n.d. | n.d. | 0 | 0 | 0 | 0 | 210 | 0 | 0 | 47 | 0 | 0 | 0.0032 |
| VOC | Methylcyclohexane | SO | 9 | mg/kg | <0.00031 | 0.0018 | 0.00 | n.d. | 0.00 | n.d. | 0.00 | 2 | 22 | - | - | - | - | - | - | - | - | - |
| VOC | Methylene Chloride | SO | 9 | mg/kg | <0.0002 | 0.0032 | 0.00 | n.d. | 0.00 | n.d. | 0.00 | 2 | 22 | 0 | 0 | 320 | 0 | 0 | 35 | 1 | 11 | 0.0027 |
| VOC | m-Xylene & p-Xylene | SO | 9 | mg/kg | <0.00014 | 0.48 | 0.05 | 0.00 | 0.16 | n.d. | 0.38 | 5 | 56 | 0 | 0 | 240 | 0 | 0 | 56 | - | - | - |
| VOC | o-Xylene | SO | 9 | mg/kg | <9.9E-05 | 0.15 | 0.02 | n.d. | 0.05 | n.d. | 0.13 | 4 | 44 | 0 | 0 | 280 | 0 | 0 | 65 | 1 | 11 | 0.019 |
| VOC | Styrene | SO | 9 | mg/kg | <9.3E-05 | <0.00021 | n.d. | n.d. | n.d. | n.d. | n.d. | 0 | 0 | 0 | 0 | 3500 | 0 | 0 | 600 | 0 | 0 | 0.13 |
| VOC | Tetrachloroethene | SO | 9 | mg/kg | <0.00017 | <0.00038 | n.d. | n.d. | n.d. | n.d. | n.d. | 0 | 0 | 0 | 0 | 39 | 0 | 0 | 8.1 | 0 | 0 | 0.0018 |
| VOC | Toluene | SO | 9 | mg/kg | <0.00024 | 0.0021 | 0.00 | 0.00 | 0.00 | n.d. | 0.00 | 7 | 78 | 0 | 0 | 4700 | 0 | 0 | 490 | 0 | 0 | 0.076 |
| VOC | trans-1,2-Dichloroethene | SO | 9 | mg/kg | <0.00024 | <0.00054 | n.d. | n.d. | n.d. | n.d. | n.d. | 0 | 0 | 0 | 0 | 2300 | 0 | 0 | 160 | 0 | 0 | 0.011 |
| VOC | trans-1,3-Dichloropropene | SO | 9 | mg/kg | <6.2E-05 | <0.00014 | n.d. | n.d. | n.d. | n.d. | n.d. | 0 | 0 | - | - | - | - | - | - | - | - | - |
| VOC | Trichloroethene | SO | 9 | mg/kg | <0.00016 | <0.00036 | n.d. | n.d. | n.d. | n.d. | n.d. | 0 | 0 | 0 | 0 | 1.9 | 0 | 0 | 0.41 | 0 | 0 | 0.0001 |
| VOC | Trichlorofluoromethane | SO | 9 | mg/kg | <0.00021 | <0.00047 | n.d. | n.d. | n.d. | n.d. | n.d. | 0 | 0 | 0 | 0 | 35000 | 0 | 0 | 2300 | 0 | 0 | 0.33 |
| VOC | Vinyl chloride | SO | 9 | mg/kg | <0.00024 | <0.00054 | n.d. | n.d. | n.d. | n.d. | n.d. | 0 | 0 | 0 | 0 | 1.7 | 0 | 0 | 0.059 | 0 | 0 | 0.0000065 |



mg/kg - Milligrams per Kilograms
n.d - Non Detect
LOD - Limit of Detection
Industiral RSL - Environmental Protection Agency Industrial Soil Regional Screening Level
Residential RSL - Environmental Protection Agency Residnetial Soil Regional Screening Level
Risk SSL - Environmental Protection Agency Human Health Protection of Ground Water - Risk-based Soil Screening Level

**Table 15. Background Surface Soil Analytical Results Statistical Summary**
**Columbia Falls Aluminum Company, LLC, Phase I Site Characterization, 2000 Aluminum Drive, Columbia Falls, MT**

| Group | Analyte | Matrix | No. of Results | Unit | Min | Max | Mean | Median | Standard Deviation | 5th Percentile | 95th Percentile | # > LOD | % > LOD | Industrial RSL No. Exceeding | Industrial RSL % Exceeding | Industrial RSL Action Level | Residential RSL No. Exceeding | Residential RSL % Exceeding | Residential RSL Action Level | Risk SSL No. Exceeding | Risk SSL % Exceeding | Risk SSL Action Level |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| GENCHEM | Fluoride | SO | 8 | mg/kg | 3.93 | 13.5 | 8.90 | 9.41 | 3.39 | 4.53 | 13.05 | 8 | 100 | 0 | 0 | 4700 | 0 | 0 | 310 | 2 | 25 | 12 |
| METALS | Aluminum | SO | 8 | mg/kg | 17300 | 29200 | 21525.00 | 20300.00 | 4228.39 | 17580.00 | 28395.00 | 8 | 100 | 0 | 0 | 110000 | 8 | 100 | 7700 | 8 | 100 | 3000 |
| METALS | Antimony | SO | 8 | mg/kg | <0.35 | <0.5 | n.d. | n.d. | n.d. | n.d. | n.d. | 0 | 0 | 0 | 0 | 47 | 0 | 0 | 3.1 | 0 | 0 | 0.035 |
| METALS | Arsenic | SO | 8 | mg/kg | 2.8 | 7.1 | 5.16 | 4.90 | 1.32 | 3.40 | 6.86 | 8 | 100 | 7 | 88 | 3 | 8 | 100 | 0.68 | 8 | 100 | 0.0015 |
| METALS | Barium | SO | 8 | mg/kg | 195 | 429 | 305.13 | 283.50 | 88.62 | 206.90 | 429.00 | 8 | 100 | 0 | 0 | 22000 | 0 | 0 | 1500 | 8 | 100 | 16 |
| METALS | Beryllium | SO | 8 | mg/kg | 0.63 | 1.2 | 0.85 | 0.86 | 0.21 | 0.64 | 1.12 | 8 | 100 | 0 | 0 | 230 | 0 | 0 | 16 | 0 | 0 | 1.9 |
| METALS | Cadmium | SO | 8 | mg/kg | <0.26 | <0.38 | n.d. | n.d. | n.d. | n.d. | n.d. | 0 | 0 | 0 | 0 | 98 | 0 | 0 | 7.1 | 0 | 0 | 0.069 |
| METALS | Calcium | SO | 8 | mg/kg | 2570 | 17200 | 5937.50 | 4530.00 | 4729.52 | 2825.50 | 13280.00 | 8 | 100 | - | - | - | - | - | - | - | - | - |
| METALS | Chromium | SO | 8 | mg/kg | 5.4 | 18.3 | 13.23 | 14.30 | 4.22 | 7.01 | 17.81 | 8 | 100 | - | - | - | - | - | - | - | - | - |
| METALS | Cobalt | SO | 8 | mg/kg | 2.9 | 7.2 | 5.96 | 6.15 | 1.33 | 3.92 | 7.13 | 8 | 100 | 0 | 0 | 35 | 8 | 100 | 2.3 | 8 | 100 | 0.027 |
| METALS | Copper | SO | 8 | mg/kg | 9.1 | 27 | 17.89 | 17.75 | 6.02 | 10.33 | 26.13 | 8 | 100 | 0 | 0 | 4700 | 0 | 0 | 310 | 8 | 100 | 2.8 |
| METALS | Cyanide, Total | SO | 8 | mg/kg | <0.026 | 0.68 | 0.17 | 0.12 | 0.21 | n.d. | 0.53 | 7 | 88 | 0 | 0 | 15 | 0 | 0 | 2.3 | 7 | 88 | 0.0015 |
| METALS | Iron | SO | 8 | mg/kg | 8140 | 19900 | 16517.50 | 17250.00 | 3631.55 | 10821.00 | 19480.00 | 8 | 100 | 0.00 | 0 | 82000 | 8 | 100 | 5500 | 8 | 100 | 35 |
| METALS | Lead | SO | 8 | mg/kg | 6.4 | 15.9 | 12.81 | 13.10 | 3.00 | 8.19 | 15.66 | 8 | 100 | 0.00 | 0 | 800 | 0 | 0 | 400 | - | - | - |
| METALS | Magnesium | SO | 8 | mg/kg | 2940 | 11400 | 8455.00 | 8765.00 | 2744.15 | 4371.50 | 11330.00 | 8 | 100 | - | - | - | - | - | - | - | - | - |
| METALS | Manganese | SO | 8 | mg/kg | 49.4 | 576 | 375.30 | 404.50 | 172.60 | 109.81 | 559.55 | 8 | 100 | 0 | 0 | 2600 | 7 | 88 | 180 | 8 | 100 | 2.8 |
| METALS | Mercury | SO | 8 | mg/kg | <0.019 | 0.036 | 0.02 | 0.02 | 0.01 | n.d. | 0.04 | 7 | 88 | 0 | 0 | 4.6 | 0 | 0 | 1.1 | 7 | 88 | 0.0033 |
| METALS | Nickel | SO | 8 | mg/kg | 6.4 | 14.2 | 12.18 | 13.15 | 2.49 | 8.15 | 13.99 | 8 | 100 | 0 | 0 | 2200 | 0 | 0 | 150 | 8 | 100 | 2.6 |
| METALS | Potassium | SO | 8 | mg/kg | 519 | 1510 | 1097.75 | 1120.00 | 292.44 | 670.90 | 1440.00 | 8 | 100 | - | - | - | - | - | - | - | - | - |
| METALS | Selenium | SO | 8 | mg/kg | <0.34 | 0.93 | 0.43 | 0.45 | 0.40 | n.d. | 0.92 | 5 | 63 | 0 | 0 | 580 | 0 | 0 | 39 | 5 | 63 | 0.052 |
| METALS | Silver | SO | 8 | mg/kg | <0.63 | <0.91 | n.d. | n.d. | n.d. | n.d. | n.d. | 0 | 0 | 0 | 0 | 580 | 0 | 0 | 39 | 0 | 0 | 0.08 |
| METALS | Sodium | SO | 8 | mg/kg | 39.6 | 552 | 146.95 | 86.90 | 167.02 | 47.69 | 406.40 | 8 | 100 | - | - | - | - | - | - | - | - | - |
| METALS | Thallium | SO | 8 | mg/kg | <0.13 | <0.19 | n.d. | n.d. | n.d. | n.d. | n.d. | 0 | 0 | 0 | 0 | 1.2 | 0 | 0 | 0.078 | 0 | 0 | 0.0014 |
| METALS | Vanadium | SO | 8 | mg/kg | 7.7 | 16.5 | 13.10 | 13.40 | 2.89 | 8.68 | 16.29 | 8 | 100 | 0 | 0 | 580 | 0 | 0 | 39 | 7 | 88 | 8.6 |
| METALS | Zinc | SO | 8 | mg/kg | 13.6 | 79.6 | 55.91 | 58.65 | 20.16 | 25.40 | 76.94 | 8 | 100 | 0 | 0 | 35000 | 0 | 0 | 2300 | 7 | 88 | 37 |
| OC_PEST | 4,4'-DDD | SO | 8 | mg/kg | <0.00099 | <0.0014 | n.d. | n.d. | n.d. | n.d. | n.d. | 0 | 0 | 0 | 0 | 9.6 | 0 | 0 | 2.3 | 0 | 0 | 0.0075 |
| OC_PEST | 4,4'-DDE | SO | 8 | mg/kg | <0.0011 | <0.0015 | n.d. | n.d. | n.d. | n.d. | n.d. | 0 | 0 | 0 | 0 | 9.3 | 0 | 0 | 2 | 0 | 0 | 0.011 |
| OC_PEST | 4,4'-DDT | SO | 8 | mg/kg | <0.00077 | <0.0011 | n.d. | n.d. | n.d. | n.d. | n.d. | 0 | 0 | 0 | 0 | 8.5 | 0 | 0 | 1.9 | 0 | 0 | 0.077 |
| OC_PEST | Aldrin | SO | 8 | mg/kg | <0.00091 | <0.0013 | n.d. | n.d. | n.d. | n.d. | n.d. | 0 | 0 | 0 | 0 | 0.18 | 0 | 0 | 0.039 | 0 | 0 | 0.00015 |
| OC_PEST | alpha-BHC | SO | 8 | mg/kg | <0.00068 | <0.00097 | n.d. | n.d. | n.d. | n.d. | n.d. | 0 | 0 | 0 | 0 | 0.36 | 0 | 0 | 0.086 | 0 | 0 | 0.000042 |
| OC_PEST | alpha-Chlordane | SO | 8 | mg/kg | <0.0012 | <0.0017 | n.d. | n.d. | n.d. | n.d. | n.d. | 0 | 0 | - | - | - | - | - | - | - | - | - |
| OC_PEST | beta-BHC | SO | 8 | mg/kg | <0.00073 | <0.001 | n.d. | n.d. | n.d. | n.d. | n.d. | 0 | 0 | 0 | 0 | 1.3 | 0 | 0 | 0.3 | 0 | 0 | 0.00015 |
| OC_PEST | delta-BHC | SO | 8 | mg/kg | <0.00082 | <0.0012 | n.d. | n.d. | n.d. | n.d. | n.d. | 0 | 0 | - | - | - | - | - | - | - | - | - |
| OC_PEST | Dieldrin | SO | 8 | mg/kg | <0.00097 | <0.0014 | n.d. | n.d. | n.d. | n.d. | n.d. | 0 | 0 | 0 | 0 | 0.14 | 0 | 0 | 0.034 | 0 | 0 | 0.000071 |
| OC_PEST | Endosulfan I | SO | 8 | mg/kg | <0.001 | <0.0015 | n.d. | n.d. | n.d. | n.d. | n.d. | 0 | 0 | - | - | - | - | - | - | - | - | - |

**Table 15. Background Surface Soil Analytical Results Statistical Summary**
**Columbia Falls Aluminum Company, LLC, Phase I Site Characterization, 2000 Aluminum Drive, Columbia Falls, MT**

| | | | | | | | | | | | | | | Industrial RSL | | | Residential RSL | | | Risk SSL | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Group | Analyte | Matrix | No. of Results | Unit | Min | Max | Mean | Median | Standard Deviation | 5th Percentile | 95th Percentile | # > LOD | % > LOD | No. Exceeding | % Exceeding | Action Level | No. Exceeding | % Exceeding | Action Level | No. Exceeding | % Exceeding | Action Level |
| OC_PEST | Endosulfan II | SO | 8 | mg/kg | <0.0012 | <0.0017 | n.d. | n.d. | n.d. | n.d. | n.d. | 0 | 0 | - | - | - | - | - | - | - | - | - |
| OC_PEST | Endosulfan sulfate | SO | 8 | mg/kg | <0.00087 | <0.0012 | n.d. | n.d. | n.d. | n.d. | n.d. | 0 | 0 | - | - | - | - | - | - | - | - | - |
| OC_PEST | Endrin | SO | 8 | mg/kg | <0.00095 | <0.0014 | n.d. | n.d. | n.d. | n.d. | n.d. | 0 | 0 | 0 | 0 | 25 | 0 | 0 | 1.9 | 0 | 0 | 0.0092 |
| OC_PEST | Endrin aldehyde | SO | 8 | mg/kg | <0.00093 | <0.0013 | n.d. | n.d. | n.d. | n.d. | n.d. | 0 | 0 | - | - | - | - | - | - | - | - | - |
| OC_PEST | Endrin ketone | SO | 8 | mg/kg | <0.001 | <0.0015 | n.d. | n.d. | n.d. | n.d. | n.d. | 0 | 0 | - | - | - | - | - | - | - | - | - |
| OC_PEST | gamma-BHC (Lindane) | SO | 8 | mg/kg | <0.00067 | <0.00095 | n.d. | n.d. | n.d. | n.d. | n.d. | 0 | 0 | 0 | 0 | 2.5 | 0 | 0 | 0.57 | 0 | 0 | 0.00024 |
| OC_PEST | gamma-Chlordane | SO | 8 | mg/kg | <0.0016 | <0.0023 | n.d. | n.d. | n.d. | n.d. | n.d. | 0 | 0 | - | - | - | - | - | - | - | - | - |
| OC_PEST | Heptachlor | SO | 8 | mg/kg | <0.00096 | <0.0014 | n.d. | n.d. | n.d. | n.d. | n.d. | 0 | 0 | 0 | 0 | 0.63 | 0 | 0 | 0.13 | 0 | 0 | 0.00012 |
| OC_PEST | Heptachlor epoxide | SO | 8 | mg/kg | <0.0015 | <0.0021 | n.d. | n.d. | n.d. | n.d. | n.d. | 0 | 0 | 0 | 0 | 0.33 | 0 | 0 | 0.07 | 0 | 0 | 0.000028 |
| OC_PEST | Methoxychlor | SO | 8 | mg/kg | <0.0016 | <0.0023 | n.d. | n.d. | n.d. | n.d. | n.d. | 0 | 0 | 0 | 0 | 410 | 0 | 0 | 32 | 0 | 0 | 0.2 |
| OC_PEST | Toxaphene | SO | 8 | mg/kg | <0.022 | <0.031 | n.d. | n.d. | n.d. | n.d. | n.d. | 0 | 0 | 0 | 0 | 2.1 | 0 | 0 | 0.49 | 0 | 0 | 0.011 |
| PCB | Aroclor 1016 | SO | 8 | mg/kg | <0.01 | <0.014 | n.d. | n.d. | n.d. | n.d. | n.d. | 0 | 0 | 0 | 0 | 5.1 | 0 | 0 | 0.41 | 0 | 0 | 0.013 |
| PCB | Aroclor 1221 | SO | 8 | mg/kg | <0.01 | <0.014 | n.d. | n.d. | n.d. | n.d. | n.d. | 0 | 0 | 0.00 | 0 | 0.83 | 0 | 0 | 0.2 | 0 | 0 | 0.00008 |
| PCB | Aroclor 1232 | SO | 8 | mg/kg | <0.01 | <0.014 | n.d. | n.d. | n.d. | n.d. | n.d. | 0 | 0 | 0 | 0 | 0.72 | 0 | 0 | 0.17 | 0 | 0 | 0.00008 |
| PCB | Aroclor 1242 | SO | 8 | mg/kg | <0.01 | <0.014 | n.d. | n.d. | n.d. | n.d. | n.d. | 0 | 0 | 0.00 | 0 | 0.95 | 0 | 0 | 0.23 | 0 | 0 | 0.0012 |
| PCB | Aroclor 1248 | SO | 8 | mg/kg | <0.01 | <0.014 | n.d. | n.d. | n.d. | n.d. | n.d. | 0 | 0 | 0 | 0 | 0.95 | 0 | 0 | 0.23 | 0 | 0 | 0.0012 |
| PCB | Aroclor 1254 | SO | 8 | mg/kg | <0.01 | <0.015 | n.d. | n.d. | n.d. | n.d. | n.d. | 0 | 0 | 0.00 | 0 | 0.97 | 0 | 0 | 0.12 | 0 | 0 | 0.002 |
| PCB | Aroclor 1260 | SO | 8 | mg/kg | <0.01 | <0.015 | n.d. | n.d. | n.d. | n.d. | n.d. | 0 | 0 | 0 | 0 | 0.99 | 0 | 0 | 0.24 | 0 | 0 | 0.0055 |
| PCB | Aroclor 1268 | SO | 8 | mg/kg | <0.01 | <0.015 | n.d. | n.d. | n.d. | n.d. | n.d. | 0 | 0 | - | - | - | - | - | - | - | - | - |
| PCB | Aroclor-1262 | SO | 8 | mg/kg | <0.01 | <0.015 | n.d. | n.d. | n.d. | n.d. | n.d. | 0 | 0 | - | - | - | - | - | - | - | - | - |
| PCB | Polychlorinated biphenyls, Total | SO | 8 | mg/kg | <0.01 | <0.015 | n.d. | n.d. | n.d. | n.d. | n.d. | 0 | 0 | 0 | 0 | 0.94 | 0 | 0 | 0.23 | 0 | 0 | 0.0068 |
| SVOC | 1,1'-Biphenyl | SO | 8 | mg/kg | <0.032 | <0.045 | n.d. | n.d. | n.d. | n.d. | n.d. | 0 | 0 | 0 | 0 | 20 | 0 | 0 | 4.7 | 0 | 0 | 0.00087 |
| SVOC | 1,2,4,5-Tetrachlorobenzene | SO | 8 | mg/kg | <0.028 | <0.039 | n.d. | n.d. | n.d. | n.d. | n.d. | 0 | 0 | 0 | 0 | 35 | 0 | 0 | 2.3 | 0 | 0 | 0.00079 |
| SVOC | 1,4-Dioxane | SO | 8 | mg/kg | <0.099 | <0.14 | n.d. | n.d. | n.d. | n.d. | n.d. | 0 | 0 | 0 | 0 | 24 | 0 | 0 | 5.3 | 0 | 0 | 0.000094 |
| SVOC | 2,2'-oxybis[1-chloropropane] | SO | 8 | mg/kg | <0.015 | <0.022 | n.d. | n.d. | n.d. | n.d. | n.d. | 0 | 0 | 0.00 | 0 | 4700 | 0 | 0 | 310 | 0 | 0 | 0.026 |
| SVOC | 2,3,4,6-Tetrachlorophenol | SO | 8 | mg/kg | <0.035 | <0.049 | n.d. | n.d. | n.d. | n.d. | n.d. | 0 | 0 | 0 | 0 | 2500 | 0 | 0 | 190 | 0 | 0 | 0.018 |
| SVOC | 2,4,5-Trichlorophenol | SO | 8 | mg/kg | <0.037 | <0.052 | n.d. | n.d. | n.d. | n.d. | n.d. | 0 | 0 | 0 | 0 | 8200 | 0 | 0 | 630 | 0 | 0 | 0.4 |
| SVOC | 2,4,6-Trichlorophenol | SO | 8 | mg/kg | <0.011 | <0.015 | n.d. | n.d. | n.d. | n.d. | n.d. | 0 | 0 | 0 | 0 | 82 | 0 | 0 | 6.3 | 0 | 0 | 0.0012 |
| SVOC | 2,4-Dichlorophenol | SO | 8 | mg/kg | <0.0087 | <0.012 | n.d. | n.d. | n.d. | n.d. | n.d. | 0 | 0 | 0 | 0 | 250 | 0 | 0 | 19 | 0 | 0 | 0.0023 |
| SVOC | 2,4-Dimethylphenol | SO | 8 | mg/kg | <0.081 | <0.12 | n.d. | n.d. | n.d. | n.d. | n.d. | 0 | 0 | 0 | 0 | 1600 | 0 | 0 | 130 | 0 | 0 | 0.042 |
| SVOC | 2,4-Dinitrophenol | SO | 8 | mg/kg | <0.28 | <0.4 | n.d. | n.d. | n.d. | n.d. | n.d. | 0 | 0 | 0 | 0 | 160 | 0 | 0 | 13 | 0 | 0 | 0.0044 |
| SVOC | 2,4-Dinitrotoluene | SO | 8 | mg/kg | <0.015 | <0.021 | n.d. | n.d. | n.d. | n.d. | n.d. | 0 | 0 | 0.00 | 0 | 7.4 | 0 | 0 | 1.7 | 0 | 0 | 0.00032 |
| SVOC | 2,6-Dinitrotoluene | SO | 8 | mg/kg | <0.02 | <0.028 | n.d. | n.d. | n.d. | n.d. | n.d. | 0 | 0 | 0 | 0 | 1.5 | 0 | 0 | 0.36 | 0 | 0 | 0.000067 |
| SVOC | 2-Chloronaphthalene | SO | 8 | mg/kg | <0.0084 | <0.012 | n.d. | n.d. | n.d. | n.d. | n.d. | 0 | 0 | 0 | 0 | 6000 | 0 | 0 | 480 | 0 | 0 | 0.39 |
| SVOC | 2-Chlorophenol | SO | 8 | mg/kg | <0.0094 | <0.013 | n.d. | n.d. | n.d. | n.d. | n.d. | 0 | 0 | 0 | 0 | 580 | 0 | 0 | 39 | 0 | 0 | 0.0089 |

**Table 15. Background Surface Soil Analytical Results Statistical Summary**
**Columbia Falls Aluminum Company, LLC, Phase I Site Characterization, 2000 Aluminum Drive, Columbia Falls, MT**

| Group | Analyte | Matrix | No. of Results | Unit | Min | Max | Mean | Median | Standard Deviation | 5th Percentile | 95th Percentile | # > LOD | % > LOD | Industrial RSL | | | Residential RSL | | | Risk SSL | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | | | | | | | No. Exceeding | % Exceeding | Action Level | No. Exceeding | % Exceeding | Action Level | No. Exceeding | % Exceeding | Action Level |
| SVOC | 2-Methylnaphthalene | SO | 8 | mg/kg | <0.0082 | <0.012 | n.d. | n.d. | n.d. | n.d. | n.d. | 0 | 0 | 0 | 0 | 300 | 0 | 0 | 24 | 0 | 0 | 0.019 |
| SVOC | 2-Methylphenol | SO | 8 | mg/kg | <0.016 | <0.023 | n.d. | n.d. | n.d. | n.d. | n.d. | 0 | 0 | 0.00 | 0 | 4100 | 0 | 0 | 320 | 0 | 0 | 0.075 |
| SVOC | 2-Nitroaniline | SO | 8 | mg/kg | <0.012 | <0.017 | n.d. | n.d. | n.d. | n.d. | n.d. | 0 | 0 | 0 | 0 | 800 | 0 | 0 | 63 | 0 | 0 | 0.008 |
| SVOC | 2-Nitrophenol | SO | 8 | mg/kg | <0.012 | <0.018 | n.d. | n.d. | n.d. | n.d. | n.d. | 0 | 0 | - | - | - | - | - | - | - | - | - |
| SVOC | 3 & 4 Methylphenol | SO | 8 | mg/kg | <0.0098 | <0.014 | n.d. | n.d. | n.d. | n.d. | n.d. | 0 | 0 | - | - | - | - | - | - | - | - | - |
| SVOC | 3,3'-Dichlorobenzidine | SO | 8 | mg/kg | <0.041 | <0.059 | n.d. | n.d. | n.d. | n.d. | n.d. | 0 | 0 | 0 | 0 | 5.1 | 0 | 0 | 1.2 | 0 | 0 | 0.00082 |
| SVOC | 3-Nitroaniline | SO | 8 | mg/kg | <0.011 | <0.016 | n.d. | n.d. | n.d. | n.d. | n.d. | 0 | 0 | - | - | - | - | - | - | - | - | - |
| SVOC | 4,6-Dinitro-2-methylphenol | SO | 8 | mg/kg | <0.099 | <0.14 | n.d. | n.d. | n.d. | n.d. | n.d. | 0 | 0 | 0 | 0 | 6.6 | 0 | 0 | 0.51 | 0 | 0 | 0.00026 |
| SVOC | 4-Bromophenyl phenyl ether | SO | 8 | mg/kg | <0.012 | <0.017 | n.d. | n.d. | n.d. | n.d. | n.d. | 0 | 0 | - | - | - | - | - | - | - | - | - |
| SVOC | 4-Chloro-3-methylphenol | SO | 8 | mg/kg | <0.016 | <0.023 | n.d. | n.d. | n.d. | n.d. | n.d. | 0 | 0 | 0.00 | 0 | 8200 | 0 | 0 | 630 | 0 | 0 | 0.17 |
| SVOC | 4-Chloroaniline | SO | 8 | mg/kg | <0.0095 | <0.014 | n.d. | n.d. | n.d. | n.d. | n.d. | 0 | 0 | 0 | 0 | 11 | 0 | 0 | 2.7 | 0 | 0 | 0.00016 |
| SVOC | 4-Chlorophenyl phenyl ether | SO | 8 | mg/kg | <0.011 | <0.016 | n.d. | n.d. | n.d. | n.d. | n.d. | 0 | 0 | - | - | - | - | - | - | - | - | - |
| SVOC | 4-Nitroaniline | SO | 8 | mg/kg | <0.014 | <0.02 | n.d. | n.d. | n.d. | n.d. | n.d. | 0 | 0 | 0 | 0 | 110 | 0 | 0 | 25 | 0 | 0 | 0.0016 |
| SVOC | 4-Nitrophenol | SO | 8 | mg/kg | <0.18 | <0.25 | n.d. | n.d. | n.d. | n.d. | n.d. | 0 | 0 | - | - | - | - | - | - | - | - | - |
| SVOC | Acenaphthene | SO | 8 | mg/kg | <0.0089 | <0.013 | n.d. | n.d. | n.d. | n.d. | n.d. | 0 | 0 | 0 | 0 | 4500 | 0 | 0 | 360 | 0 | 0 | 0.55 |
| SVOC | Acenaphthylene | SO | 8 | mg/kg | <0.0095 | <0.014 | n.d. | n.d. | n.d. | n.d. | n.d. | 0 | 0 | - | - | - | - | - | - | - | - | - |
| SVOC | Acetophenone | SO | 8 | mg/kg | <0.0081 | <0.011 | n.d. | n.d. | n.d. | n.d. | n.d. | 0 | 0 | 0 | 0 | 12000 | 0 | 0 | 780 | 0 | 0 | 0.058 |
| SVOC | Anthracene | SO | 8 | mg/kg | <0.035 | <0.05 | n.d. | n.d. | n.d. | n.d. | n.d. | 0 | 0 | 0 | 0 | 23000 | 0 | 0 | 1800 | 0 | 0 | 5.8 |
| SVOC | Atrazine | SO | 8 | mg/kg | <0.016 | <0.023 | n.d. | n.d. | n.d. | n.d. | n.d. | 0 | 0 | 0 | 0 | 10 | 0 | 0 | 2.4 | 0 | 0 | 0.0002 |
| SVOC | Benzaldehyde | SO | 8 | mg/kg | <0.028 | <0.04 | n.d. | n.d. | n.d. | n.d. | n.d. | 0 | 0 | 0 | 0 | 820 | 0 | 0 | 170 | 0 | 0 | 0.0041 |
| SVOC | Benzo[a]anthracene | SO | 8 | mg/kg | <0.032 | 0.091 | 0.02 | n.d. | 0.03 | n.d. | 0.09 | 3 | 38 | 0 | 0 | 2.9 | 0 | 0 | 0.16 | 3 | 38 | 0.0042 |
| SVOC | Benzo[a]pyrene | SO | 8 | mg/kg | <0.011 | 0.11 | 0.03 | 0.02 | 0.04 | n.d. | 0.10 | 6 | 75 | 0 | 0 | 0.29 | 5 | 63 | 0.016 | 6 | 75 | 0.004 |
| SVOC | Benzo[b]fluoranthene | SO | 8 | mg/kg | <0.021 | 0.24 | 0.07 | 0.05 | 0.08 | n.d. | 0.20 | 7 | 88 | 0 | 0 | 2.9 | 1 | 13 | 0.16 | 5 | 63 | 0.041 |
| SVOC | Benzo[g,h,i]perylene | SO | 8 | mg/kg | <0.022 | 0.11 | 0.03 | n.d. | 0.04 | n.d. | 0.11 | 3 | 38 | - | - | - | - | - | - | - | - | - |
| SVOC | Benzo[k]fluoranthene | SO | 8 | mg/kg | <0.016 | 0.072 | 0.02 | 0.01 | 0.03 | n.d. | 0.07 | 4 | 50 | 0 | 0 | 29 | 0 | 0 | 1.6 | 0 | 0 | 0.4 |
| SVOC | Bis(2-chloroethoxy)methane | SO | 8 | mg/kg | <0.012 | <0.016 | n.d. | n.d. | n.d. | n.d. | n.d. | 0 | 0 | 0 | 0 | 250 | 0 | 0 | 19 | 0 | 0 | 0.0013 |
| SVOC | Bis(2-chloroethyl)ether | SO | 8 | mg/kg | <0.0087 | <0.012 | n.d. | n.d. | n.d. | n.d. | n.d. | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0.23 | 0 | 0 | 0.0000036 |
| SVOC | Bis(2-ethylhexyl) phthalate | SO | 8 | mg/kg | <0.014 | <0.021 | n.d. | n.d. | n.d. | n.d. | n.d. | 0 | 0 | 0 | 0 | 160 | 0 | 0 | 39 | 0 | 0 | 1.3 |
| SVOC | Butyl benzyl phthalate | SO | 8 | mg/kg | <0.011 | <0.016 | n.d. | n.d. | n.d. | n.d. | n.d. | 0 | 0 | 0 | 0 | 1200 | 0 | 0 | 290 | 0 | 0 | 0.24 |
| SVOC | Caprolactam | SO | 8 | mg/kg | <0.027 | <0.038 | n.d. | n.d. | n.d. | n.d. | n.d. | 0 | 0 | 0 | 0 | 40000 | 0 | 0 | 3100 | 0 | 0 | 0.25 |
| SVOC | Carbazole | SO | 8 | mg/kg | <0.0092 | 0.014 | n.d. | n.d. | n.d. | n.d. | 0.01 | 1 | 13 | - | - | - | - | - | - | - | - | - |
| SVOC | Chrysene | SO | 8 | mg/kg | <0.014 | 0.15 | 0.04 | 0.03 | 0.05 | n.d. | 0.12 | 7 | 88 | 0 | 0 | 290 | 0 | 0 | 16 | 0 | 0 | 1.2 |
| SVOC | Dibenz(a,h)anthracene | SO | 8 | mg/kg | <0.019 | <0.027 | n.d. | n.d. | n.d. | n.d. | n.d. | 0 | 0 | 0.00 | 0 | 0.29 | 0 | 0 | 0.016 | 0 | 0 | 0.013 |
| SVOC | Dibenzofuran | SO | 8 | mg/kg | <0.011 | <0.016 | n.d. | n.d. | n.d. | n.d. | n.d. | 0 | 0 | 0.00 | 0 | 100 | 0 | 0 | 7.3 | 0 | 0 | 0.015 |
| SVOC | Diethyl phthalate | SO | 8 | mg/kg | <0.011 | <0.015 | n.d. | n.d. | n.d. | n.d. | n.d. | 0 | 0 | 0 | 0 | 66000 | 0 | 0 | 5100 | 0 | 0 | 0.61 |

**Table 15. Background Surface Soil Analytical Results Statistical Summary**
**Columbia Falls Aluminum Company, LLC, Phase I Site Characterization, 2000 Aluminum Drive, Columbia Falls, MT**

| | | | | | | | | | | | | | | Industrial RSL | | | Residential RSL | | | Risk SSL | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Group | Analyte | Matrix | No. of Results | Unit | Min | Max | Mean | Median | Standard Deviation | 5th Percentile | 95th Percentile | # > LOD | % > LOD | No. Exceeding | % Exceeding | Action Level | No. Exceeding | % Exceeding | Action Level | No. Exceeding | % Exceeding | Action Level |
| SVOC | Dimethyl phthalate | SO | 8 | mg/kg | <0.011 | <0.015 | n.d. | n.d. | n.d. | n.d. | n.d. | 0 | 0 | - | - | - | - | - | - | - | - | - |
| SVOC | Di-n-butyl phthalate | SO | 8 | mg/kg | <0.011 | <0.016 | n.d. | n.d. | n.d. | n.d. | n.d. | 0 | 0 | 0 | 0 | 8200 | 0 | 0 | 630 | 0 | 0 | 0.23 |
| SVOC | Di-n-octyl phthalate | SO | 8 | mg/kg | <0.019 | <0.027 | n.d. | n.d. | n.d. | n.d. | n.d. | 0 | 0 | 0 | 0 | 820 | 0 | 0 | 63 | 0 | 0 | 5.7 |
| SVOC | Fluoranthene | SO | 8 | mg/kg | <0.016 | 0.17 | 0.05 | 0.03 | 0.05 | n.d. | 0.14 | 7 | 88 | 0 | 0 | 3000 | 0 | 0 | 240 | 0 | 0 | 8.9 |
| SVOC | Fluorene | SO | 8 | mg/kg | <0.0081 | <0.011 | n.d. | n.d. | n.d. | n.d. | n.d. | 0 | 0 | 0 | 0 | 3000 | 0 | 0 | 240 | 0 | 0 | 0.54 |
| SVOC | Hexachlorobenzene | SO | 8 | mg/kg | <0.015 | <0.021 | n.d. | n.d. | n.d. | n.d. | n.d. | 0 | 0 | 0 | 0 | 0.96 | 0 | 0 | 0.21 | 0 | 0 | 0.00012 |
| SVOC | Hexachlorobutadiene | SO | 8 | mg/kg | <0.01 | <0.015 | n.d. | n.d. | n.d. | n.d. | n.d. | 0 | 0 | 0 | 0 | 5.3 | 0 | 0 | 1.2 | 0 | 0 | 0.00027 |
| SVOC | Hexachlorocyclopentadiene | SO | 8 | mg/kg | <0.023 | <0.033 | n.d. | n.d. | n.d. | n.d. | n.d. | 0 | 0 | 0 | 0 | 0.75 | 0 | 0 | 0.18 | 0 | 0 | 0.00013 |
| SVOC | Hexachloroethane | SO | 8 | mg/kg | <0.014 | <0.019 | n.d. | n.d. | n.d. | n.d. | n.d. | 0 | 0 | 0 | 0 | 8 | 0 | 0 | 1.8 | 0 | 0 | 0.0002 |
| SVOC | Indeno[1,2,3-cd]pyrene | SO | 8 | mg/kg | <0.025 | 0.11 | 0.03 | n.d. | 0.04 | n.d. | 0.11 | 3 | 38 | 0 | 0 | 2.9 | 0 | 0 | 0.16 | 0 | 0 | 0.13 |
| SVOC | Isophorone | SO | 8 | mg/kg | <0.0079 | <0.011 | n.d. | n.d. | n.d. | n.d. | n.d. | 0 | 0 | 0 | 0 | 2400 | 0 | 0 | 570 | 0 | 0 | 0.026 |
| SVOC | Naphthalene | SO | 8 | mg/kg | <0.0094 | <0.013 | n.d. | n.d. | n.d. | n.d. | n.d. | 0 | 0 | 0 | 0 | 17 | 0 | 0 | 3.8 | 0 | 0 | 0.00054 |
| SVOC | Nitrobenzene | SO | 8 | mg/kg | <0.012 | <0.017 | n.d. | n.d. | n.d. | n.d. | n.d. | 0 | 0 | 0 | 0 | 22 | 0 | 0 | 5.1 | 0 | 0 | 0.000092 |
| SVOC | N-Nitrosodi-n-propylamine | SO | 8 | mg/kg | <0.012 | <0.018 | n.d. | n.d. | n.d. | n.d. | n.d. | 0 | 0 | 0 | 0 | 0.33 | 0 | 0 | 0.078 | 0 | 0 | 0.0000081 |
| SVOC | N-Nitrosodiphenylamine | SO | 8 | mg/kg | <0.034 | <0.048 | n.d. | n.d. | n.d. | n.d. | n.d. | 0 | 0 | 0 | 0 | 470 | 0 | 0 | 110 | 0 | 0 | 0.067 |
| SVOC | Pentachlorophenol | SO | 8 | mg/kg | <0.045 | <0.064 | n.d. | n.d. | n.d. | n.d. | n.d. | 0 | 0 | 0 | 0 | 4 | 0 | 0 | 1 | 0 | 0 | 0.000057 |
| SVOC | Phenanthrene | SO | 8 | mg/kg | <0.01 | 0.083 | 0.02 | 0.02 | 0.03 | n.d. | 0.07 | 6 | 75 | - | - | - | - | - | - | - | - | - |
| SVOC | Phenol | SO | 8 | mg/kg | <0.012 | <0.017 | n.d. | n.d. | n.d. | n.d. | n.d. | 0 | 0 | 0 | 0 | 25000 | 0 | 0 | 1900 | 0 | 0 | 0.33 |
| SVOC | Pyrene | SO | 8 | mg/kg | <0.017 | 0.17 | 0.05 | 0.03 | 0.06 | n.d. | 0.14 | 6 | 75 | 0 | 0 | 2300 | 0 | 0 | 180 | 0 | 0 | 1.3 |

mg/kg - Milligrams per Kilograms
n.d - Non Detect
LOD - Limit of Detection
Industiral RSL - Environmental Protection Agency Industrial Soil Regional Screening Level
Residential RSL - Environmental Protection Agency Residnetial Soil Regional Screening Level
Risk SSL - Environmental Protection Agency Human Health Protection of Ground Water - Risk-based Soil Screening Level

**Table 16. Background Shallow Soil Analytical Results Statistical Summary**
**Columbia Falls Aluminum Company, LLC, Phase I Site Characterization, 2000 Aluminum Drive, Columbia Falls, MT**

| | | | | | | | | | | | | | | | Industrial RSL | | | Residential RSL | | | Risk SSL | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Group | Analyte | Matrix | Fraction | No. of Results | Unit | Min | Max | Mean | Median | Standard Deviation | 5th Percentile | 95th Percentile | # > LOD | % > LOD | No. Exceeding | % Exceeding | Action Level | No. Exceeding | % Exceeding | Action Level | No. Exceeding | % Exceeding | Action Level |
| GENCHEM | Fluoride | SO | N | 8 | mg/kg | 1.54 | 10.1 | 6.22 | 6.09 | 3.15 | 1.85 | 9.82 | 8 | 100 | 0 | 0 | 4700 | 0 | 0 | 310 | 0 | 0 | 12 |
| METALS | Aluminum | SO | T | 8 | mg/kg | 11700 | 30900 | 18575.00 | 17750.00 | 5570.78 | 13135.00 | 26945.00 | 8 | 100 | 0 | 0 | 110000 | 8 | 100 | 7700 | 8 | 100 | 3000 |
| METALS | Antimony | SO | T | 8 | mg/kg | <0.36 | <0.51 | n.d. | n.d. | n.d. | n.d. | n.d. | 0 | 0 | 0 | 0 | 47 | 0 | 0 | 3.1 | 0 | 0 | 0.035 |
| METALS | Arsenic | SO | T | 8 | mg/kg | 2.2 | 6.8 | 5.04 | 5.30 | 1.37 | 2.97 | 6.52 | 8 | 100 | 7 | 88 | 3 | 8 | 100 | 0.68 | 8 | 100 | 0.0015 |
| METALS | Barium | SO | T | 8 | mg/kg | 120 | 440 | 255.63 | 266.50 | 101.93 | 132.60 | 392.75 | 8 | 100 | 0 | 0 | 22000 | 0 | 0 | 1500 | 8 | 100 | 16 |
| METALS | Beryllium | SO | T | 8 | mg/kg | 0.35 | 1.2 | 0.71 | 0.69 | 0.27 | 0.39 | 1.08 | 8 | 100 | 0 | 0 | 230 | 0 | 0 | 16 | 0 | 0 | 1.9 |
| METALS | Cadmium | SO | T | 8 | mg/kg | <0.27 | <0.39 | n.d. | n.d. | n.d. | n.d. | n.d. | 0 | 0 | 0 | 0 | 98 | 0 | 0 | 7.1 | 0 | 0 | 0.069 |
| METALS | Calcium | SO | T | 8 | mg/kg | 1830 | 10900 | 4430.00 | 3375.00 | 2906.79 | 2019.00 | 9122.00 | 8 | 100 | - | - | - | - | - | - | - | - | - |
| METALS | Chromium | SO | T | 8 | mg/kg | 4.9 | 20.9 | 12.90 | 12.50 | 4.81 | 6.72 | 19.29 | 8 | 100 | - | - | - | - | - | - | - | - | - |
| METALS | Cobalt | SO | T | 8 | mg/kg | 2.8 | 7.4 | 6.08 | 6.30 | 1.49 | 3.75 | 7.33 | 8 | 100 | 0 | 0 | 35 | 8 | 100 | 2.3 | 8 | 100 | 0.027 |
| METALS | Copper | SO | T | 8 | mg/kg | 10.2 | 23 | 15.86 | 16.70 | 4.98 | 10.34 | 22.16 | 8 | 100 | 0 | 0 | 4700 | 0 | 0 | 310 | 8 | 100 | 2.8 |
| METALS | Cyanide, Total | SO | T | 8 | mg/kg | <0.024 | 0.16 | 0.08 | 0.08 | 0.05 | n.d. | 0.15 | 7 | 88 | 0 | 0 | 15 | 0 | 0 | 2.3 | 7 | 88 | 0.0015 |
| METALS | Iron | SO | T | 8 | mg/kg | 7710 | 19200 | 15901.25 | 16750.00 | 3573.24 | 10261.50 | 18850.00 | 8 | 100 | 0.00 | 0 | 82000 | 8 | 100 | 5500 | 8 | 100 | 35 |
| METALS | Lead | SO | T | 8 | mg/kg | 5.1 | 21.2 | 13.76 | 13.40 | 5.21 | 6.57 | 20.54 | 8 | 100 | 0.00 | 0 | 800 | 0 | 0 | 400 | - | - | - |
| METALS | Magnesium | SO | T | 8 | mg/kg | 2950 | 10700 | 8426.25 | 9260.00 | 2505.07 | 4451.50 | 10665.00 | 8 | 100 | - | - | - | - | - | - | - | - | - |
| METALS | Manganese | SO | T | 8 | mg/kg | 44.4 | 659 | 418.30 | 458.00 | 184.14 | 132.46 | 623.65 | 8 | 100 | 0 | 0 | 2600 | 7 | 88 | 180 | 8 | 100 | 2.8 |
| METALS | Mercury | SO | T | 8 | mg/kg | <0.013 | 0.039 | 0.02 | 0.02 | 0.01 | n.d. | 0.04 | 6 | 75 | 0 | 0 | 4.6 | 0 | 0 | 1.1 | 6 | 75 | 0.0033 |
| METALS | Nickel | SO | T | 8 | mg/kg | 5.8 | 14.2 | 11.30 | 12.00 | 2.56 | 7.38 | 13.78 | 8 | 100 | 0 | 0 | 2200 | 0 | 0 | 150 | 8 | 100 | 2.6 |
| METALS | Potassium | SO | T | 8 | mg/kg | 551 | 1340 | 945.63 | 953.50 | 301.52 | 552.40 | 1298.00 | 8 | 100 | - | - | - | - | - | - | - | - | - |
| METALS | Selenium | SO | T | 8 | mg/kg | <0.34 | 1.1 | 0.28 | n.d. | 0.43 | n.d. | 1.08 | 3 | 38 | 0 | 0 | 580 | 0 | 0 | 39 | 3 | 38 | 0.052 |
| METALS | Silver | SO | T | 8 | mg/kg | <0.66 | <0.93 | n.d. | n.d. | n.d. | n.d. | n.d. | 0 | 0 | 0 | 0 | 580 | 0 | 0 | 39 | 0 | 0 | 0.08 |
| METALS | Sodium | SO | T | 8 | mg/kg | 38.8 | 555 | 151.11 | 76.00 | 176.17 | 44.44 | 448.60 | 8 | 100 | - | - | - | - | - | - | - | - | - |
| METALS | Thallium | SO | T | 8 | mg/kg | <0.14 | <0.19 | n.d. | n.d. | n.d. | n.d. | n.d. | 0 | 0 | 0 | 0 | 1.2 | 0 | 0 | 0.078 | 0 | 0 | 0.0014 |
| METALS | Vanadium | SO | T | 8 | mg/kg | 7.4 | 15.1 | 12.26 | 12.50 | 2.30 | 8.77 | 14.72 | 8 | 100 | 0 | 0 | 580 | 0 | 0 | 39 | 7 | 88 | 8.6 |
| METALS | Zinc | SO | T | 8 | mg/kg | 12.6 | 59.9 | 44.91 | 49.00 | 14.73 | 20.83 | 57.73 | 8 | 100 | 0 | 0 | 35000 | 0 | 0 | 2300 | 6 | 75 | 37 |
| PCB | Aroclor 1016 | SO | N | 8 | mg/kg | <0.0097 | <0.013 | n.d. | n.d. | n.d. | n.d. | n.d. | 0 | 0 | 0 | 0 | 5.1 | 0 | 0 | 0.41 | 0 | 0 | 0.013 |
| PCB | Aroclor 1221 | SO | N | 8 | mg/kg | <0.0097 | <0.013 | n.d. | n.d. | n.d. | n.d. | n.d. | 0 | 0 | 0 | 0 | 0.83 | 0 | 0 | 0.2 | 0 | 0 | 0.00008 |
| PCB | Aroclor 1232 | SO | N | 8 | mg/kg | <0.0097 | <0.013 | n.d. | n.d. | n.d. | n.d. | n.d. | 0 | 0 | 0 | 0 | 0.72 | 0 | 0 | 0.17 | 0 | 0 | 0.00008 |
| PCB | Aroclor 1242 | SO | N | 8 | mg/kg | <0.0097 | <0.013 | n.d. | n.d. | n.d. | n.d. | n.d. | 0 | 0 | 0 | 0 | 0.95 | 0 | 0 | 0.23 | 0 | 0 | 0.0012 |
| PCB | Aroclor 1248 | SO | N | 8 | mg/kg | <0.0097 | <0.013 | n.d. | n.d. | n.d. | n.d. | n.d. | 0 | 0 | 0 | 0 | 0.95 | 0 | 0 | 0.23 | 0 | 0 | 0.0012 |
| PCB | Aroclor 1254 | SO | N | 8 | mg/kg | <0.01 | <0.014 | n.d. | n.d. | n.d. | n.d. | n.d. | 0 | 0 | 0 | 0 | 0.97 | 0 | 0 | 0.12 | 0 | 0 | 0.002 |
| PCB | Aroclor 1260 | SO | N | 8 | mg/kg | <0.01 | <0.014 | n.d. | n.d. | n.d. | n.d. | n.d. | 0 | 0 | 0 | 0 | 0.99 | 0 | 0 | 0.24 | 0 | 0 | 0.0055 |
| PCB | Aroclor 1268 | SO | N | 8 | mg/kg | <0.01 | <0.014 | n.d. | n.d. | n.d. | n.d. | n.d. | 0 | 0 | - | - | - | - | - | - | - | - | - |
| PCB | Aroclor-1262 | SO | N | 8 | mg/kg | <0.01 | <0.014 | n.d. | n.d. | n.d. | n.d. | n.d. | 0 | 0 | - | - | - | - | - | - | - | - | - |
| PCB | Polychlorinated biphenyls, Total | SO | N | 8 | mg/kg | <0.01 | <0.014 | n.d. | n.d. | n.d. | n.d. | n.d. | 0 | 0 | 0 | 0 | 0.94 | 0 | 0 | 0.23 | 0 | 0 | 0.0068 |
| SVOC | 1,1'-Biphenyl | SO | N | 8 | mg/kg | <0.031 | 0.046 | n.d. | n.d. | n.d. | n.d. | 0.05 | 1 | 13 | 0 | 0 | 20 | 0 | 0 | 4.7 | 1 | 13 | 0.00087 |
| SVOC | 1,2,4,5-Tetrachlorobenzene | SO | N | 8 | mg/kg | <0.027 | <0.037 | n.d. | n.d. | n.d. | n.d. | n.d. | 0 | 0 | 0.00 | 0 | 35 | 0 | 0 | 2.3 | 0 | 0 | 0.00079 |

**Table 16. Background Shallow Soil Analytical Results Statistical Summary**
**Columbia Falls Aluminum Company, LLC, Phase I Site Characterization, 2000 Aluminum Drive, Columbia Falls, MT**



| Group | Analyte | Matrix | Fraction | No. of Results | Unit | Min | Max | Mean | Median | Standard Deviation | 5th Percentile | 95th Percentile | # > LOD | % > LOD | Industrial RSL No. Exceeding | Industrial RSL % Exceeding | Industrial RSL Action Level | Residential RSL No. Exceeding | Residential RSL % Exceeding | Residential RSL Action Level | Risk SSL No. Exceeding | Risk SSL % Exceeding | Risk SSL Action Level |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| SVOC | 1,4-Dioxane | SO | N | 8 | mg/kg | <0.096 | <0.13 | n.d. | n.d. | n.d. | n.d. | n.d. | 0 | 0 | 0 | 0 | 24 | 0 | 0 | 5.3 | 0 | 0 | 0.000094 |
| SVOC | 2,2'-oxybis[1-chloropropane] | SO | N | 8 | mg/kg | <0.015 | <0.021 | n.d. | n.d. | n.d. | n.d. | n.d. | 0 | 0 | 0 | 0 | 4700 | 0 | 0 | 310 | 0 | 0 | 0.026 |
| SVOC | 2,3,4,6-Tetrachlorophenol | SO | N | 8 | mg/kg | <0.034 | <0.047 | n.d. | n.d. | n.d. | n.d. | n.d. | 0 | 0 | 0 | 0 | 2500 | 0 | 0 | 190 | 0 | 0 | 0.018 |
| SVOC | 2,4,5-Trichlorophenol | SO | N | 8 | mg/kg | <0.036 | <0.05 | n.d. | n.d. | n.d. | n.d. | n.d. | 0 | 0 | 0 | 0 | 8200 | 0 | 0 | 630 | 0 | 0 | 0.4 |
| SVOC | 2,4,6-Trichlorophenol | SO | N | 8 | mg/kg | <0.01 | <0.014 | n.d. | n.d. | n.d. | n.d. | n.d. | 0 | 0 | 0 | 0 | 82 | 0 | 0 | 6.3 | 0 | 0 | 0.0012 |
| SVOC | 2,4-Dichlorophenol | SO | N | 8 | mg/kg | <0.0085 | <0.012 | n.d. | n.d. | n.d. | n.d. | n.d. | 0 | 0 | 0.00 | 0 | 250 | 0 | 0 | 19 | 0 | 0 | 0.0023 |
| SVOC | 2,4-Dimethylphenol | SO | N | 8 | mg/kg | <0.079 | <0.11 | n.d. | n.d. | n.d. | n.d. | n.d. | 0 | 0 | 0 | 0 | 1600 | 0 | 0 | 130 | 0 | 0 | 0.042 |
| SVOC | 2,4-Dinitrophenol | SO | N | 8 | mg/kg | <0.27 | <0.38 | n.d. | n.d. | n.d. | n.d. | n.d. | 0 | 0 | 0.00 | 0 | 160 | 0 | 0 | 13 | 0 | 0 | 0.0044 |
| SVOC | 2,4-Dinitrotoluene | SO | N | 8 | mg/kg | <0.014 | <0.02 | n.d. | n.d. | n.d. | n.d. | n.d. | 0 | 0 | 0 | 0 | 7.4 | 0 | 0 | 1.7 | 0 | 0 | 0.00032 |
| SVOC | 2,6-Dinitrotoluene | SO | N | 8 | mg/kg | <0.019 | <0.027 | n.d. | n.d. | n.d. | n.d. | n.d. | 0 | 0 | 0.00 | 0 | 1.5 | 0 | 0 | 0.36 | 0 | 0 | 0.000067 |
| SVOC | 2-Chloronaphthalene | SO | N | 8 | mg/kg | <0.0081 | <0.011 | n.d. | n.d. | n.d. | n.d. | n.d. | 0 | 0 | 0 | 0 | 6000 | 0 | 0 | 480 | 0 | 0 | 0.39 |
| SVOC | 2-Chlorophenol | SO | N | 8 | mg/kg | <0.0091 | <0.013 | n.d. | n.d. | n.d. | n.d. | n.d. | 0 | 0 | 0 | 0 | 580 | 0 | 0 | 39 | 0 | 0 | 0.0089 |
| SVOC | 2-Methylnaphthalene | SO | N | 8 | mg/kg | <0.0079 | <0.011 | n.d. | n.d. | n.d. | n.d. | n.d. | 0 | 0 | 0 | 0 | 300 | 0 | 0 | 24 | 0 | 0 | 0.019 |
| SVOC | 2-Methylphenol | SO | N | 8 | mg/kg | <0.016 | <0.022 | n.d. | n.d. | n.d. | n.d. | n.d. | 0 | 0 | 0 | 0 | 4100 | 0 | 0 | 320 | 0 | 0 | 0.075 |
| SVOC | 2-Nitroaniline | SO | N | 8 | mg/kg | <0.012 | <0.016 | n.d. | n.d. | n.d. | n.d. | n.d. | 0 | 0 | 0 | 0 | 800 | 0 | 0 | 63 | 0 | 0 | 0.008 |
| SVOC | 2-Nitrophenol | SO | N | 8 | mg/kg | <0.012 | <0.017 | n.d. | n.d. | n.d. | n.d. | n.d. | 0 | 0 | - | - | - | - | - | - | - | - | - |
| SVOC | 3 & 4 Methylphenol | SO | N | 8 | mg/kg | <0.0095 | <0.013 | n.d. | n.d. | n.d. | n.d. | n.d. | 0 | 0 | - | - | - | - | - | - | - | - | - |
| SVOC | 3,3'-Dichlorobenzidine | SO | N | 8 | mg/kg | <0.04 | <0.056 | n.d. | n.d. | n.d. | n.d. | n.d. | 0 | 0 | 0.00 | 0 | 5.1 | 0 | 0 | 1.2 | 0 | 0 | 0.00082 |
| SVOC | 3-Nitroaniline | SO | N | 8 | mg/kg | <0.011 | <0.015 | n.d. | n.d. | n.d. | n.d. | n.d. | 0 | 0 | - | - | - | - | - | - | - | - | - |
| SVOC | 4,6-Dinitro-2-methylphenol | SO | N | 8 | mg/kg | <0.096 | <0.13 | n.d. | n.d. | n.d. | n.d. | n.d. | 0 | 0 | 0 | 0 | 6.6 | 0 | 0 | 0.51 | 0 | 0 | 0.00026 |
| SVOC | 4-Bromophenyl phenyl ether | SO | N | 8 | mg/kg | <0.011 | <0.016 | n.d. | n.d. | n.d. | n.d. | n.d. | 0 | 0 | - | - | - | - | - | - | - | - | - |
| SVOC | 4-Chloro-3-methylphenol | SO | N | 8 | mg/kg | <0.015 | <0.021 | n.d. | n.d. | n.d. | n.d. | n.d. | 0 | 0 | 0 | 0 | 8200 | 0 | 0 | 630 | 0 | 0 | 0.17 |
| SVOC | 4-Chloroaniline | SO | N | 8 | mg/kg | <0.0092 | <0.013 | n.d. | n.d. | n.d. | n.d. | n.d. | 0 | 0 | 0 | 0 | 11 | 0 | 0 | 2.7 | 0 | 0 | 0.00016 |
| SVOC | 4-Chlorophenyl phenyl ether | SO | N | 8 | mg/kg | <0.011 | <0.015 | n.d. | n.d. | n.d. | n.d. | n.d. | 0 | 0 | - | - | - | - | - | - | - | - | - |
| SVOC | 4-Nitroaniline | SO | N | 8 | mg/kg | <0.014 | <0.019 | n.d. | n.d. | n.d. | n.d. | n.d. | 0 | 0 | 0.00 | 0 | 110 | 0 | 0 | 25 | 0 | 0 | 0.0016 |
| SVOC | 4-Nitrophenol | SO | N | 8 | mg/kg | <0.17 | <0.24 | n.d. | n.d. | n.d. | n.d. | n.d. | 0 | 0 | - | - | - | - | - | - | - | - | - |
| SVOC | Acenaphthene | SO | N | 8 | mg/kg | <0.0087 | <0.012 | n.d. | n.d. | n.d. | n.d. | n.d. | 0 | 0 | 0 | 0 | 4500 | 0 | 0 | 360 | 0 | 0 | 0.55 |
| SVOC | Acenaphthylene | SO | N | 8 | mg/kg | <0.0092 | <0.013 | n.d. | n.d. | n.d. | n.d. | n.d. | 0 | 0 | - | - | - | - | - | - | - | - | - |
| SVOC | Acetophenone | SO | N | 8 | mg/kg | <0.0078 | <0.011 | n.d. | n.d. | n.d. | n.d. | n.d. | 0 | 0 | 0 | 0 | 12000 | 0 | 0 | 780 | 0 | 0 | 0.058 |
| SVOC | Anthracene | SO | N | 8 | mg/kg | <0.034 | <0.047 | n.d. | n.d. | n.d. | n.d. | n.d. | 0 | 0 | 0.00 | 0 | 23000 | 0 | 0 | 1800 | 0 | 0 | 5.8 |
| SVOC | Atrazine | SO | N | 8 | mg/kg | <0.016 | <0.022 | n.d. | n.d. | n.d. | n.d. | n.d. | 0 | 0 | 0 | 0 | 10 | 0 | 0 | 2.4 | 0 | 0 | 0.0002 |
| SVOC | Benzaldehyde | SO | N | 8 | mg/kg | <0.027 | <0.038 | n.d. | n.d. | n.d. | n.d. | n.d. | 0 | 0 | 0 | 0 | 820 | 0 | 0 | 170 | 0 | 0 | 0.0041 |
| SVOC | Benzo[a]anthracene | SO | N | 8 | mg/kg | <0.03 | <0.042 | n.d. | n.d. | n.d. | n.d. | n.d. | 0 | 0 | 0 | 0 | 2.9 | 0 | 0 | 0.16 | 0 | 0 | 0.0042 |
| SVOC | Benzo[a]pyrene | SO | N | 8 | mg/kg | <0.011 | 0.019 | 0.01 | n.d. | 0.01 | n.d. | 0.02 | 3 | 38 | 0 | 0 | 0.29 | 1 | 13 | 0.016 | 3 | 38 | 0.004 |
| SVOC | Benzo[b]fluoranthene | SO | N | 8 | mg/kg | <0.014 | 0.032 | 0.01 | n.d. | 0.02 | n.d. | 0.03 | 3 | 38 | 0 | 0 | 2.9 | 0 | 0 | 0.16 | 0 | 0 | 0.041 |
| SVOC | Benzo[g,h,i]perylene | SO | N | 8 | mg/kg | <0.021 | 0.022 | n.d. | n.d. | n.d. | n.d. | 0.02 | 1 | 13 | - | - | - | - | - | - | - | - | - |
| SVOC | Benzo[k]fluoranthene | SO | N | 8 | mg/kg | <0.016 | <0.022 | n.d. | n.d. | n.d. | n.d. | n.d. | 0 | 0 | 0 | 0 | 29 | 0 | 0 | 1.6 | 0 | 0 | 0.4 |

**Table 16. Background Shallow Soil Analytical Results Statistical Summary**
**Columbia Falls Aluminum Company, LLC, Phase I Site Characterization, 2000 Aluminum Drive, Columbia Falls, MT**

| | | | | | | | | | | | | | | | Industrial RSL | | | Residential RSL | | | Risk SSL | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Group | Analyte | Matrix | Fraction | No. of Results | Unit | Min | Max | Mean | Median | Standard Deviation | 5th Percentile | 95th Percentile | # > LOD | % > LOD | No. Exceeding | % Exceeding | Action Level | No. Exceeding | % Exceeding | Action Level | No. Exceeding | % Exceeding | Action Level |
| SVOC | Bis(2-chloroethoxy)methane | SO | N | 8 | mg/kg | <0.011 | <0.016 | n.d. | n.d. | n.d. | n.d. | n.d. | 0 | 0 | 0 | 0 | 250 | 0 | 0 | 19 | 0 | 0 | 0.0013 |
| SVOC | Bis(2-chloroethyl)ether | SO | N | 8 | mg/kg | <0.0085 | <0.012 | n.d. | n.d. | n.d. | n.d. | n.d. | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0.23 | 0 | 0 | 0.0000036 |
| SVOC | Bis(2-ethylhexyl) phthalate | SO | N | 8 | mg/kg | <0.014 | <0.019 | n.d. | n.d. | n.d. | n.d. | n.d. | 0 | 0 | 0 | 0 | 160 | 0 | 0 | 39 | 0 | 0 | 1.3 |
| SVOC | Butyl benzyl phthalate | SO | N | 8 | mg/kg | <0.011 | <0.015 | n.d. | n.d. | n.d. | n.d. | n.d. | 0 | 0 | 0.00 | 0 | 1200 | 0 | 0 | 290 | 0 | 0 | 0.24 |
| SVOC | Caprolactam | SO | N | 8 | mg/kg | <0.026 | <0.036 | n.d. | n.d. | n.d. | n.d. | n.d. | 0 | 0 | 0 | 0 | 40000 | 0 | 0 | 3100 | 0 | 0 | 0.25 |
| SVOC | Carbazole | SO | N | 8 | mg/kg | <0.0089 | <0.012 | n.d. | n.d. | n.d. | n.d. | n.d. | 0 | 0 | - | - | - | - | - | - | - | - | - |
| SVOC | Chrysene | SO | N | 8 | mg/kg | <0.0099 | 0.023 | 0.01 | 0.01 | 0.01 | n.d. | 0.02 | 4 | 50 | 0 | 0 | 290 | 0 | 0 | 16 | 0 | 0 | 1.2 |
| SVOC | Dibenz(a,h)anthracene | SO | N | 8 | mg/kg | <0.019 | <0.026 | n.d. | n.d. | n.d. | n.d. | n.d. | 0 | 0 | 0 | 0 | 0.29 | 0 | 0 | 0.016 | 0 | 0 | 0.013 |
| SVOC | Dibenzofuran | SO | N | 8 | mg/kg | <0.011 | <0.015 | n.d. | n.d. | n.d. | n.d. | n.d. | 0 | 0 | 0.00 | 0 | 100 | 0 | 0 | 7.3 | 0 | 0 | 0.015 |
| SVOC | Diethyl phthalate | SO | N | 8 | mg/kg | <0.01 | 0.032 | n.d. | n.d. | n.d. | n.d. | 0.03 | 1 | 13 | 0 | 0 | 66000 | 0 | 0 | 5100 | 0 | 0 | 0.61 |
| SVOC | Dimethyl phthalate | SO | N | 8 | mg/kg | <0.01 | <0.015 | n.d. | n.d. | n.d. | n.d. | n.d. | 0 | 0 | - | - | - | - | - | - | - | - | - |
| SVOC | Di-n-butyl phthalate | SO | N | 8 | mg/kg | <0.011 | 0.48 | n.d. | n.d. | n.d. | n.d. | 0.48 | 1 | 13 | 0 | 0 | 8200 | 0 | 0 | 630 | 1 | 13 | 0.23 |
| SVOC | Di-n-octyl phthalate | SO | N | 8 | mg/kg | <0.018 | <0.025 | n.d. | n.d. | n.d. | n.d. | n.d. | 0 | 0 | 0 | 0 | 820 | 0 | 0 | 63 | 0 | 0 | 5.7 |
| SVOC | Fluoranthene | SO | N | 8 | mg/kg | <0.011 | 0.029 | 0.01 | n.d. | 0.01 | n.d. | 0.03 | 3 | 38 | 0 | 0 | 3000 | 0 | 0 | 240 | 0 | 0 | 8.9 |
| SVOC | Fluorene | SO | N | 8 | mg/kg | <0.0078 | <0.011 | n.d. | n.d. | n.d. | n.d. | n.d. | 0 | 0 | 0 | 0 | 3000 | 0 | 0 | 240 | 0 | 0 | 0.54 |
| SVOC | Hexachlorobenzene | SO | N | 8 | mg/kg | <0.015 | <0.02 | n.d. | n.d. | n.d. | n.d. | n.d. | 0 | 0 | 0 | 0 | 0.96 | 0 | 0 | 0.21 | 0 | 0 | 0.00012 |
| SVOC | Hexachlorobutadiene | SO | N | 8 | mg/kg | <0.01 | <0.014 | n.d. | n.d. | n.d. | n.d. | n.d. | 0 | 0 | 0 | 0 | 5.3 | 0 | 0 | 1.2 | 0 | 0 | 0.00027 |
| SVOC | Hexachlorocyclopentadiene | SO | N | 8 | mg/kg | <0.022 | <0.031 | n.d. | n.d. | n.d. | n.d. | n.d. | 0 | 0 | 0 | 0 | 0.75 | 0 | 0 | 0.18 | 0 | 0 | 0.00013 |
| SVOC | Hexachloroethane | SO | N | 8 | mg/kg | <0.013 | <0.018 | n.d. | n.d. | n.d. | n.d. | n.d. | 0 | 0 | 0 | 0 | 8 | 0 | 0 | 1.8 | 0 | 0 | 0.0002 |
| SVOC | Indeno[1,2,3-cd]pyrene | SO | N | 8 | mg/kg | <0.024 | <0.033 | n.d. | n.d. | n.d. | n.d. | n.d. | 0 | 0 | 0 | 0 | 2.9 | 0 | 0 | 0.16 | 0 | 0 | 0.13 |
| SVOC | Isophorone | SO | N | 8 | mg/kg | <0.0077 | <0.011 | n.d. | n.d. | n.d. | n.d. | n.d. | 0 | 0 | 0 | 0 | 2400 | 0 | 0 | 570 | 0 | 0 | 0.026 |
| SVOC | Naphthalene | SO | N | 8 | mg/kg | <0.0091 | <0.013 | n.d. | n.d. | n.d. | n.d. | n.d. | 0 | 0 | 0 | 0 | 17 | 0 | 0 | 3.8 | 0 | 0 | 0.00054 |
| SVOC | Nitrobenzene | SO | N | 8 | mg/kg | <0.011 | <0.016 | n.d. | n.d. | n.d. | n.d. | n.d. | 0 | 0 | 0 | 0 | 22 | 0 | 0 | 5.1 | 0 | 0 | 0.000092 |
| SVOC | N-Nitrosodi-n-propylamine | SO | N | 8 | mg/kg | <0.012 | <0.017 | n.d. | n.d. | n.d. | n.d. | n.d. | 0 | 0 | 0.00 | 0 | 0.33 | 0 | 0 | 0.078 | 0 | 0 | 0.0000081 |
| SVOC | N-Nitrosodiphenylamine | SO | N | 8 | mg/kg | <0.033 | <0.045 | n.d. | n.d. | n.d. | n.d. | n.d. | 0 | 0 | 0.00 | 0 | 470 | 0 | 0 | 110 | 0 | 0 | 0.067 |
| SVOC | Pentachlorophenol | SO | N | 8 | mg/kg | <0.043 | <0.06 | n.d. | n.d. | n.d. | n.d. | n.d. | 0 | 0 | 0 | 0 | 4 | 0 | 0 | 1 | 0 | 0 | 0.000057 |
| SVOC | Phenanthrene | SO | N | 8 | mg/kg | <0.0095 | 0.016 | 0.00 | n.d. | 0.01 | n.d. | 0.02 | 2 | 25 | - | - | - | - | - | - | - | - | - |
| SVOC | Phenol | SO | N | 8 | mg/kg | <0.012 | <0.016 | n.d. | n.d. | n.d. | n.d. | n.d. | 0 | 0 | 0 | 0 | 25000 | 0 | 0 | 1900 | 0 | 0 | 0.33 |
| SVOC | Pyrene | SO | N | 8 | mg/kg | <0.016 | 0.029 | 0.01 | n.d. | 0.01 | n.d. | 0.03 | 2 | 25 | 0.00 | 0 | 2300 | 0 | 0 | 180 | 0 | 0 | 1.3 |
| VOC | 1,1,1-Trichloroethane | SO | N | 8 | mg/kg | <0.00039 | <0.0006 | n.d. | n.d. | n.d. | n.d. | n.d. | 0 | 0 | 0 | 0 | 3600 | 0 | 0 | 810 | 0 | 0 | 0.28 |
| VOC | 1,1,2,2-Tetrachloroethane | SO | N | 8 | mg/kg | <0.00017 | <0.00027 | n.d. | n.d. | n.d. | n.d. | n.d. | 0 | 0 | 0 | 0 | 2.7 | 0 | 0 | 0.6 | 0 | 0 | 0.00003 |
| VOC | 1,1,2-Trichloro-1,2,2-trifluoroethane | SO | N | 8 | mg/kg | <0.00045 | <0.0007 | n.d. | n.d. | n.d. | n.d. | n.d. | 0 | 0 | 0 | 0 | 17000 | 0 | 0 | 4000 | 0 | 0 | 14 |
| VOC | 1,1,2-Trichloroethane | SO | N | 8 | mg/kg | <0.00028 | <0.00044 | n.d. | n.d. | n.d. | n.d. | n.d. | 0 | 0 | 0 | 0 | 0.63 | 0 | 0 | 0.15 | 0 | 0 | 0.000013 |
| VOC | 1,1-Dichloroethane | SO | N | 8 | mg/kg | <0.00035 | <0.00054 | n.d. | n.d. | n.d. | n.d. | n.d. | 0 | 0 | 0 | 0 | 16 | 0 | 0 | 3.6 | 0 | 0 | 0.00078 |
| VOC | 1,1-Dichloroethene | SO | N | 8 | mg/kg | <0.00042 | <0.00065 | n.d. | n.d. | n.d. | n.d. | n.d. | 0 | 0 | 0 | 0 | 100 | 0 | 0 | 23 | 0 | 0 | 0.01 |
| VOC | 1,2,3-Trichlorobenzene | SO | N | 8 | mg/kg | <0.00011 | <0.00017 | n.d. | n.d. | n.d. | n.d. | n.d. | 0 | 0 | 0 | 0 | 93 | 0 | 0 | 6.3 | 0 | 0 | 0.0021 |
| VOC | 1,2,4-Trichlorobenzene | SO | N | 8 | mg/kg | <0.00033 | <0.00051 | n.d. | n.d. | n.d. | n.d. | n.d. | 0 | 0 | 0 | 0 | 26 | 0 | 0 | 5.8 | 0 | 0 | 0.0012 |

**Table 16. Background Shallow Soil Analytical Results Statistical Summary**
**Columbia Falls Aluminum Company, LLC, Phase I Site Characterization, 2000 Aluminum Drive, Columbia Falls, MT**

| | | | | | | | | | | | | | | | Industrial RSL | | | Residential RSL | | | Risk SSL | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Group | Analyte | Matrix | Fraction | No. of Results | Unit | Min | Max | Mean | Median | Standard Deviation | 5th Percentile | 95th Percentile | # > LOD | % > LOD | No. Exceeding | % Exceeding | Action Level | No. Exceeding | % Exceeding | Action Level | No. Exceeding | % Exceeding | Action Level |
| VOC | 1,2-Dibromo-3-Chloropropane | SO | N | 8 | mg/kg | <0.00048 | <0.00074 | n.d. | n.d. | n.d. | n.d. | n.d. | 0 | 0 | 0 | 0 | 0.064 | 0 | 0 | 0.0053 | 0 | 0 | 0.00000014 |
| VOC | 1,2-Dichlorobenzene | SO | N | 8 | mg/kg | <0.00014 | <0.00022 | n.d. | n.d. | n.d. | n.d. | n.d. | 0 | 0 | 0 | 0 | 930 | 0 | 0 | 180 | 0 | 0 | 0.03 |
| VOC | 1,2-Dichloroethane | SO | N | 8 | mg/kg | <0.00011 | <0.00017 | n.d. | n.d. | n.d. | n.d. | n.d. | 0 | 0 | 0 | 0 | 2 | 0 | 0 | 0.46 | 0 | 0 | 0.000048 |
| VOC | 1,2-Dichloropropane | SO | N | 8 | mg/kg | <0.00017 | <0.00027 | n.d. | n.d. | n.d. | n.d. | n.d. | 0 | 0 | 0 | 0 | 4.4 | 0 | 0 | 1 | 0 | 0 | 0.00015 |
| VOC | 1,3-Dichlorobenzene | SO | N | 8 | mg/kg | <0.00012 | <0.00019 | n.d. | n.d. | n.d. | n.d. | n.d. | 0 | 0 | - | - | - | - | - | - | - | - | - |
| VOC | 1,4-Dichlorobenzene | SO | N | 8 | mg/kg | <0.00013 | <0.00021 | n.d. | n.d. | n.d. | n.d. | n.d. | 0 | 0 | 0 | 0 | 11 | 0 | 0 | 2.6 | 0 | 0 | 0.00046 |
| VOC | 2-Butanone (MEK) | SO | N | 8 | mg/kg | <0.00078 | <0.0012 | n.d. | n.d. | n.d. | n.d. | n.d. | 0 | 0 | 0 | 0 | 19000 | 0 | 0 | 2700 | 0 | 0 | 0.12 |
| VOC | 2-Hexanone | SO | N | 8 | mg/kg | <0.00095 | <0.0015 | n.d. | n.d. | n.d. | n.d. | n.d. | 0 | 0 | 0 | 0 | 130 | 0 | 0 | 20 | 0 | 0 | 0.00088 |
| VOC | 4-Methyl-2-pentanone (MIBK) | SO | N | 8 | mg/kg | <0.0023 | <0.0035 | n.d. | n.d. | n.d. | n.d. | n.d. | 0 | 0 | 0.00 | 0 | 14000 | 0 | 0 | 3300 | 0 | 0 | 0.14 |
| VOC | Acetone | SO | N | 8 | mg/kg | 0.012 | 0.093 | 0.05 | 0.05 | 0.03 | 0.01 | 0.08 | 8 | 100 | 0 | 0 | 67000 | 0 | 0 | 6100 | 0 | 0 | 0.29 |
| VOC | Benzene | SO | N | 8 | mg/kg | <0.0002 | 0.0015 | 0.00 | 0.00 | 0.00 | n.d. | 0.00 | 6 | 75 | 0 | 0 | 5.1 | 0 | 0 | 1.2 | 6 | 75 | 0.00023 |
| VOC | Bromoform | SO | N | 8 | mg/kg | <0.00013 | <0.00021 | n.d. | n.d. | n.d. | n.d. | n.d. | 0 | 0 | 0 | 0 | 86 | 0 | 0 | 19 | 0 | 0 | 0.00087 |
| VOC | Bromomethane | SO | N | 8 | mg/kg | <0.00033 | <0.00051 | n.d. | n.d. | n.d. | n.d. | n.d. | 0 | 0 | 0 | 0 | 3 | 0 | 0 | 0.68 | 0 | 0 | 0.00019 |
| VOC | Carbon disulfide | SO | N | 8 | mg/kg | <0.00044 | <0.00068 | n.d. | n.d. | n.d. | n.d. | n.d. | 0 | 0 | 0 | 0 | 350 | 0 | 0 | 77 | 0 | 0 | 0.024 |
| VOC | Carbon tetrachloride | SO | N | 8 | mg/kg | <0.00044 | <0.00068 | n.d. | n.d. | n.d. | n.d. | n.d. | 0 | 0 | 0 | 0 | 2.9 | 0 | 0 | 0.65 | 0 | 0 | 0.00018 |
| VOC | Chlorobenzene | SO | N | 8 | mg/kg | <0.00014 | <0.00022 | n.d. | n.d. | n.d. | n.d. | n.d. | 0 | 0 | 0 | 0 | 130 | 0 | 0 | 28 | 0 | 0 | 0.0053 |
| VOC | Chlorobromomethane | SO | N | 8 | mg/kg | <0.00017 | <0.00027 | n.d. | n.d. | n.d. | n.d. | n.d. | 0 | 0 | 0 | 0 | 63 | 0 | 0 | 15 | 0 | 0 | 0.0021 |
| VOC | Chlorodibromomethane | SO | N | 8 | mg/kg | <0.00015 | <0.00024 | n.d. | n.d. | n.d. | n.d. | n.d. | 0 | 0 | 0 | 0 | 39 | 0 | 0 | 8.3 | 0 | 0 | 0.00023 |
| VOC | Chloroethane | SO | N | 8 | mg/kg | <0.00036 | <0.00055 | n.d. | n.d. | n.d. | n.d. | n.d. | 0 | 0 | 0 | 0 | 5700 | 0 | 0 | 1400 | 0 | 0 | 0.59 |
| VOC | Chloroform | SO | N | 8 | mg/kg | <0.00021 | <0.00033 | n.d. | n.d. | n.d. | n.d. | n.d. | 0 | 0 | 0 | 0 | 1.4 | 0 | 0 | 0.32 | 0 | 0 | 0.000061 |
| VOC | Chloromethane | SO | N | 8 | mg/kg | <0.00039 | <0.0006 | n.d. | n.d. | n.d. | n.d. | n.d. | 0 | 0 | 0 | 0 | 46 | 0 | 0 | 11 | 0 | 0 | 0.0049 |
| VOC | cis-1,2-Dichloroethene | SO | N | 8 | mg/kg | <0.00022 | <0.00035 | n.d. | n.d. | n.d. | n.d. | n.d. | 0 | 0 | 0 | 0 | 230 | 0 | 0 | 16 | 0 | 0 | 0.0011 |
| VOC | cis-1,3-Dichloropropene | SO | N | 8 | mg/kg | <0.00015 | <0.00024 | n.d. | n.d. | n.d. | n.d. | n.d. | 0 | 0 | - | - | - | - | - | - | - | - | - |
| VOC | Cyclohexane | SO | N | 8 | mg/kg | <0.00047 | 0.001 | n.d. | n.d. | n.d. | n.d. | 0.00 | 1 | 13 | 0 | 0 | 2700 | 0 | 0 | 650 | 0 | 0 | 1.3 |
| VOC | Dichlorobromomethane | SO | N | 8 | mg/kg | <0.00039 | <0.0006 | n.d. | n.d. | n.d. | n.d. | n.d. | 0 | 0 | 0 | 0 | 1.3 | 0 | 0 | 0.29 | 0 | 0 | 0.000036 |
| VOC | Dichlorodifluoromethane | SO | N | 8 | mg/kg | <0.00033 | <0.00051 | n.d. | n.d. | n.d. | n.d. | n.d. | 0 | 0 | 0 | 0 | 37 | 0 | 0 | 8.7 | 0 | 0 | 0.03 |
| VOC | Ethylbenzene | SO | N | 8 | mg/kg | <0.00018 | <0.00028 | n.d. | n.d. | n.d. | n.d. | n.d. | 0 | 0 | 0 | 0 | 25 | 0 | 0 | 5.8 | 0 | 0 | 0.0017 |
| VOC | Ethylene Dibromide | SO | N | 8 | mg/kg | <0.00012 | <0.00019 | n.d. | n.d. | n.d. | n.d. | n.d. | 0 | 0 | 0 | 0 | 0.16 | 0 | 0 | 0.036 | 0 | 0 | 0.0000021 |
| VOC | Isopropylbenzene | SO | N | 8 | mg/kg | <0.00017 | <0.00027 | n.d. | n.d. | n.d. | n.d. | n.d. | 0 | 0 | 0 | 0 | 990 | 0 | 0 | 190 | 0 | 0 | 0.074 |
| VOC | Methyl acetate | SO | N | 8 | mg/kg | <0.00092 | 0.035 | 0.01 | 0.00 | 0.01 | n.d. | 0.03 | 5 | 63 | 0 | 0 | 120000 | 0 | 0 | 7800 | 0 | 0 | 0.41 |
| VOC | Methyl tert-butyl ether | SO | N | 8 | mg/kg | <0.00017 | <0.00027 | n.d. | n.d. | n.d. | n.d. | n.d. | 0 | 0 | 0 | 0 | 210 | 0 | 0 | 47 | 0 | 0 | 0.0032 |
| VOC | Methylcyclohexane | SO | N | 8 | mg/kg | <0.00051 | 0.0015 | n.d. | n.d. | n.d. | n.d. | 0.00 | 1 | 13 | - | - | - | - | - | - | - | - | - |
| VOC | Methylene Chloride | SO | N | 8 | mg/kg | <0.00033 | <0.00051 | n.d. | n.d. | n.d. | n.d. | n.d. | 0 | 0 | 0.00 | 0 | 320 | 0 | 0 | 35 | 0 | 0 | 0.0027 |
| VOC | m-Xylene & p-Xylene | SO | N | 8 | mg/kg | <0.00011 | 0.00051 | n.d. | n.d. | n.d. | n.d. | 0.00 | 1 | 13 | 0 | 0 | 240 | 0 | 0 | 56 | - | - | - |
| VOC | o-Xylene | SO | N | 8 | mg/kg | <0.00016 | <0.00025 | n.d. | n.d. | n.d. | n.d. | n.d. | 0 | 0 | 0 | 0 | 280 | 0 | 0 | 65 | 0 | 0 | 0.019 |
| VOC | Styrene | SO | N | 8 | mg/kg | <0.00015 | <0.00024 | n.d. | n.d. | n.d. | n.d. | n.d. | 0 | 0 | 0.00 | 0 | 3500 | 0 | 0 | 600 | 0 | 0 | 0.13 |
| VOC | Tetrachloroethene | SO | N | 8 | mg/kg | <0.00028 | <0.00044 | n.d. | n.d. | n.d. | n.d. | n.d. | 0 | 0 | 0 | 0 | 39 | 0 | 0 | 8.1 | 0 | 0 | 0.0018 |

**Table 16. Background Shallow Soil Analytical Results Statistical Summary**
**Columbia Falls Aluminum Company, LLC, Phase I Site Characterization, 2000 Aluminum Drive, Columbia Falls, MT**

| | | | | | | | | | | | | | | | Industrial RSL | | | Residential RSL | | | Risk SSL | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Group | Analyte | Matrix | Fraction | No. of Results | Unit | Min | Max | Mean | Median | Standard Deviation | 5th Percentile | 95th Percentile | # > LOD | % > LOD | No. Exceeding | % Exceeding | Action Level | No. Exceeding | % Exceeding | Action Level | No. Exceeding | % Exceeding | Action Level |
| VOC | Toluene | SO | N | 8 | mg/kg | <0.00019 | 0.0014 | 0.00 | n.d. | 0.00 | n.d. | 0.00 | 2 | 25 | 0 | 0 | 4700 | 0 | 0 | 490 | 0 | 0 | 0.076 |
| VOC | trans-1,2-Dichloroethene | SO | N | 8 | mg/kg | <0.0004 | <0.00062 | n.d. | n.d. | n.d. | n.d. | n.d. | 0 | 0 | 0 | 0 | 2300 | 0 | 0 | 160 | 0 | 0 | 0.011 |
| VOC | trans-1,3-Dichloropropene | SO | N | 8 | mg/kg | <0.0001 | <0.00016 | n.d. | n.d. | n.d. | n.d. | n.d. | 0 | 0 | - | - | - | - | - | - | - | - | - |
| VOC | Trichloroethene | SO | N | 8 | mg/kg | <0.00026 | <0.00041 | n.d. | n.d. | n.d. | n.d. | n.d. | 0 | 0 | 0 | 0 | 1.9 | 0 | 0 | 0.41 | 0 | 0 | 0.0001 |
| VOC | Trichlorofluoromethane | SO | N | 8 | mg/kg | <0.00035 | <0.00054 | n.d. | n.d. | n.d. | n.d. | n.d. | 0 | 0 | 0 | 0 | 35000 | 0 | 0 | 2300 | 0 | 0 | 0.33 |
| VOC | Vinyl chloride | SO | N | 8 | mg/kg | <0.0004 | <0.00062 | n.d. | n.d. | n.d. | n.d. | n.d. | 0 | 0 | 0 | 0 | 1.7 | 0 | 0 | 0.059 | 0 | 0 | 0.0000065 |

mg/kg - Milligrams per Kilograms
n.d - Non Detect
LOD - Limit of Detection
Industiral RSL - Environmental Protection Agency Industrial Soil Regional Screening Level
Residential RSL - Environmental Protection Agency Residnetial Soil Regional Screening Level
Risk SSL - Environmental Protection Agency Human Health Protection of Ground Water - Risk-based Soil Screening Level

**Table 17. Background Intermediate Depth Soil Analytical Results Statistical Summary**
**Columbia Falls Aluminum Company, LLC, Phase I Site Characterization, 2000 Aluminum Drive, Columbia Falls, MT**

| | | | | | | | | | | | | | | Industrial RSL | | | Residential RSL | | | Risk SSL | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Group | Analyte | Matrix | No. of Results | Unit | Min | Max | Mean | Median | Standard Deviation | 5th Percentile | 95th Percentile | # > LOD | % > LOD | No. Exceeding | % Exceeding | Action Level | No. Exceeding | % Exceeding | Action Level | No. Exceeding | % Exceeding | Action Level |
| GENCHEM | Fluoride | SO | 8 | mg/kg | 0.43 | 2.61 | 1.03 | 0.84 | 0.71 | 0.48 | 2.18 | 8 | 100 | 0 | 0 | 4700 | 0 | 0 | 310 | 0 | 0 | 12 |
| METALS | Aluminum | SO | 8 | mg/kg | 3840 | 13800 | 7388.75 | 6655.00 | 3099.82 | 4155.00 | 12123.50 | 8 | 100 | 0 | 0 | 110000 | 3 | 38 | 7700 | 8 | 100 | 3000 |
| METALS | Antimony | SO | 8 | mg/kg | <0.32 | <0.35 | n.d. | n.d. | n.d. | n.d. | n.d. | 0 | 0 | 0 | 0 | 47 | 0 | 0 | 3.1 | 0 | 0 | 0.035 |
| METALS | Arsenic | SO | 8 | mg/kg | 2.1 | 5.3 | 3.95 | 4.30 | 1.07 | 2.35 | 5.09 | 8 | 100 | 6 | 75 | 3 | 8 | 100 | 0.68 | 8 | 100 | 0.0015 |
| METALS | Barium | SO | 8 | mg/kg | 30.3 | 172 | 73.39 | 64.85 | 44.27 | 34.75 | 142.25 | 8 | 100 | 0 | 0 | 22000 | 0 | 0 | 1500 | 8 | 100 | 16 |
| METALS | Beryllium | SO | 8 | mg/kg | 0.22 | 0.49 | 0.35 | 0.35 | 0.10 | 0.23 | 0.49 | 8 | 100 | 0 | 0 | 230 | 0 | 0 | 16 | 0 | 0 | 1.9 |
| METALS | Cadmium | SO | 8 | mg/kg | <0.24 | <0.27 | n.d. | n.d. | n.d. | n.d. | n.d. | 0 | 0 | 0 | 0 | 98 | 0 | 0 | 7.1 | 0 | 0 | 0.069 |
| METALS | Calcium | SO | 8 | mg/kg | 9280 | 32300 | 16950.00 | 14500.00 | 9056.84 | 9287.00 | 31215.00 | 8 | 100 | - | - | - | - | - | - | - | - | - |
| METALS | Chromium | SO | 8 | mg/kg | 6.3 | 21.3 | 10.73 | 9.60 | 4.97 | 6.44 | 18.75 | 8 | 100 | - | - | - | - | - | - | - | - | - |
| METALS | Cobalt | SO | 8 | mg/kg | 3.2 | 5.7 | 4.55 | 4.60 | 0.93 | 3.38 | 5.70 | 8 | 100 | 0 | 0 | 35 | 8 | 100 | 2.3 | 8 | 100 | 0.027 |
| METALS | Copper | SO | 8 | mg/kg | 3.7 | 17.4 | 11.06 | 10.75 | 4.07 | 5.63 | 16.49 | 8 | 100 | 0 | 0 | 4700 | 0 | 0 | 310 | 8 | 100 | 2.8 |
| METALS | Cyanide, Total | SO | 8 | mg/kg | <0.017 | 0.034 | 0.02 | 0.02 | 0.01 | n.d. | 0.03 | 6 | 75 | 0 | 0 | 15 | 0 | 0 | 2.3 | 6 | 75 | 0.0015 |
| METALS | Iron | SO | 8 | mg/kg | 7100 | 15000 | 11563.75 | 12450.00 | 2553.62 | 7968.00 | 14405.00 | 8 | 100 | 0.00 | 0 | 82000 | 8 | 100 | 5500 | 8 | 100 | 35 |
| METALS | Lead | SO | 8 | mg/kg | 3.1 | 7.9 | 6.15 | 6.30 | 1.58 | 3.70 | 7.83 | 8 | 100 | 0.00 | 0 | 800 | 0 | 0 | 400 | - | - | - |
| METALS | Magnesium | SO | 8 | mg/kg | 6060 | 12100 | 9083.75 | 8970.00 | 2286.36 | 6126.50 | 11855.00 | 8 | 100 | - | - | - | - | - | - | - | - | - |
| METALS | Manganese | SO | 8 | mg/kg | 115 | 642 | 386.13 | 410.00 | 160.86 | 153.15 | 590.20 | 8 | 100 | 0 | 0 | 2600 | 7 | 88 | 180 | 8 | 100 | 2.8 |
| METALS | Mercury | SO | 8 | mg/kg | <0.012 | 0.026 | 0.01 | 0.01 | 0.01 | n.d. | 0.02 | 6 | 75 | 0 | 0 | 4.6 | 0 | 0 | 1.1 | 6 | 75 | 0.0033 |
| METALS | Nickel | SO | 8 | mg/kg | 5.2 | 11.6 | 8.76 | 8.70 | 2.29 | 5.80 | 11.43 | 8 | 100 | 0 | 0 | 2200 | 0 | 0 | 150 | 8 | 100 | 2.6 |
| METALS | Potassium | SO | 8 | mg/kg | 427 | 788 | 628.13 | 681.50 | 132.53 | 443.80 | 768.75 | 8 | 100 | - | - | - | - | - | - | - | - | - |
| METALS | Selenium | SO | 8 | mg/kg | <0.3 | <0.33 | n.d. | n.d. | n.d. | n.d. | n.d. | 0 | 0 | 0 | 0 | 580 | 0 | 0 | 39 | 0 | 0 | 0.052 |
| METALS | Silver | SO | 8 | mg/kg | <0.59 | <0.65 | n.d. | n.d. | n.d. | n.d. | n.d. | 0 | 0 | 0 | 0 | 580 | 0 | 0 | 39 | 0 | 0 | 0.08 |
| METALS | Sodium | SO | 8 | mg/kg | <31.8 | 64.3 | 17.88 | n.d. | 25.94 | n.d. | 62.22 | 3 | 38 | - | - | - | - | - | - | - | - | - |
| METALS | Thallium | SO | 8 | mg/kg | <0.12 | <0.13 | n.d. | n.d. | n.d. | n.d. | n.d. | 0 | 0 | 0 | 0 | 1.2 | 0 | 0 | 0.078 | 0 | 0 | 0.0014 |
| METALS | Vanadium | SO | 8 | mg/kg | 4.9 | 10.5 | 7.96 | 7.75 | 2.04 | 5.43 | 10.47 | 8 | 100 | 0 | 0 | 580 | 0 | 0 | 39 | 3 | 38 | 8.6 |
| METALS | Zinc | SO | 8 | mg/kg | 16.9 | 41.3 | 28.46 | 28.80 | 7.25 | 19.07 | 38.19 | 8 | 100 | 0 | 0 | 35000 | 0 | 0 | 2300 | 1 | 13 | 37 |
| PCB | Aroclor 1016 | SO | 8 | mg/kg | <0.0093 | <0.0099 | n.d. | n.d. | n.d. | n.d. | n.d. | 0 | 0 | 0 | 0 | 5.1 | 0 | 0 | 0.41 | 0 | 0 | 0.013 |
| PCB | Aroclor 1221 | SO | 8 | mg/kg | <0.0093 | <0.0099 | n.d. | n.d. | n.d. | n.d. | n.d. | 0 | 0 | 0 | 0 | 0.83 | 0 | 0 | 0.2 | 0 | 0 | 0.00008 |
| PCB | Aroclor 1232 | SO | 8 | mg/kg | <0.0093 | <0.0099 | n.d. | n.d. | n.d. | n.d. | n.d. | 0 | 0 | 0 | 0 | 0.72 | 0 | 0 | 0.17 | 0 | 0 | 0.00008 |
| PCB | Aroclor 1242 | SO | 8 | mg/kg | <0.0093 | <0.0099 | n.d. | n.d. | n.d. | n.d. | n.d. | 0 | 0 | 0 | 0 | 0.95 | 0 | 0 | 0.23 | 0 | 0 | 0.0012 |
| PCB | Aroclor 1248 | SO | 8 | mg/kg | <0.0093 | <0.0099 | n.d. | n.d. | n.d. | n.d. | n.d. | 0 | 0 | 0 | 0 | 0.95 | 0 | 0 | 0.23 | 0 | 0 | 0.0012 |
| PCB | Aroclor 1254 | SO | 8 | mg/kg | <0.0096 | <0.01 | n.d. | n.d. | n.d. | n.d. | n.d. | 0 | 0 | 0 | 0 | 0.97 | 0 | 0 | 0.12 | 0 | 0 | 0.002 |
| PCB | Aroclor 1260 | SO | 8 | mg/kg | <0.0096 | <0.01 | n.d. | n.d. | n.d. | n.d. | n.d. | 0 | 0 | 0 | 0 | 0.99 | 0 | 0 | 0.24 | 0 | 0 | 0.0055 |
| PCB | Aroclor 1268 | SO | 8 | mg/kg | <0.0096 | <0.01 | n.d. | n.d. | n.d. | n.d. | n.d. | 0 | 0 | - | - | - | - | - | - | - | - | - |
| PCB | Aroclor-1262 | SO | 8 | mg/kg | <0.0096 | <0.01 | n.d. | n.d. | n.d. | n.d. | n.d. | 0 | 0 | - | - | - | - | - | - | - | - | - |
| PCB | Polychlorinated biphenyls, Total | SO | 8 | mg/kg | <0.0096 | <0.01 | n.d. | n.d. | n.d. | n.d. | n.d. | 0 | 0 | 0 | 0 | 0.94 | 0 | 0 | 0.23 | 0 | 0 | 0.0068 |
| SVOC | 1,1'-Biphenyl | SO | 8 | mg/kg | <0.029 | <0.031 | n.d. | n.d. | n.d. | n.d. | n.d. | 0 | 0 | 0 | 0 | 20 | 0 | 0 | 4.7 | 0 | 0 | 0.00087 |
| SVOC | 1,2,4,5-Tetrachlorobenzene | SO | 8 | mg/kg | <0.026 | <0.027 | n.d. | n.d. | n.d. | n.d. | n.d. | 0 | 0 | 0 | 0 | 35 | 0 | 0 | 2.3 | 0 | 0 | 0.00079 |

**Table 17. Background Intermediate Depth Soil Analytical Results Statistical Summary**
**Columbia Falls Aluminum Company, LLC, Phase I Site Characterization, 2000 Aluminum Drive, Columbia Falls, MT**

| | | | | | | | | | | | | | | Industrial RSL | | | Residential RSL | | | Risk SSL | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Group | Analyte | Matrix | No. of Results | Unit | Min | Max | Mean | Median | Standard Deviation | 5th Percentile | 95th Percentile | # > LOD | % > LOD | No. Exceeding | % Exceeding | Action Level | No. Exceeding | % Exceeding | Action Level | No. Exceeding | % Exceeding | Action Level |
| SVOC | 1,4-Dioxane | SO | 8 | mg/kg | <0.092 | <0.098 | n.d. | n.d. | n.d. | n.d. | n.d. | 0 | 0 | 0 | 0 | 24 | 0 | 0 | 5.3 | 0 | 0 | 0.000094 |
| SVOC | 2,2'-oxybis[1-chloropropane] | SO | 8 | mg/kg | <0.014 | <0.015 | n.d. | n.d. | n.d. | n.d. | n.d. | 0 | 0 | 0.00 | 0 | 4700 | 0 | 0 | 310 | 0 | 0 | 0.026 |
| SVOC | 2,3,4,6-Tetrachlorophenol | SO | 8 | mg/kg | <0.032 | <0.034 | n.d. | n.d. | n.d. | n.d. | n.d. | 0 | 0 | 0.00 | 0 | 2500 | 0 | 0 | 190 | 0 | 0 | 0.018 |
| SVOC | 2,4,5-Trichlorophenol | SO | 8 | mg/kg | <0.034 | <0.036 | n.d. | n.d. | n.d. | n.d. | n.d. | 0 | 0 | 0 | 0 | 8200 | 0 | 0 | 630 | 0 | 0 | 0.4 |
| SVOC | 2,4,6-Trichlorophenol | SO | 8 | mg/kg | <0.0098 | <0.01 | n.d. | n.d. | n.d. | n.d. | n.d. | 0 | 0 | 0.00 | 0 | 82 | 0 | 0 | 6.3 | 0 | 0 | 0.0012 |
| SVOC | 2,4-Dichlorophenol | SO | 8 | mg/kg | <0.0081 | <0.0086 | n.d. | n.d. | n.d. | n.d. | n.d. | 0 | 0 | 0 | 0 | 250 | 0 | 0 | 19 | 0 | 0 | 0.0023 |
| SVOC | 2,4-Dimethylphenol | SO | 8 | mg/kg | <0.076 | <0.08 | n.d. | n.d. | n.d. | n.d. | n.d. | 0 | 0 | 0 | 0 | 1600 | 0 | 0 | 130 | 0 | 0 | 0.042 |
| SVOC | 2,4-Dinitrophenol | SO | 8 | mg/kg | <0.26 | <0.28 | n.d. | n.d. | n.d. | n.d. | n.d. | 0 | 0 | 0 | 0 | 160 | 0 | 0 | 13 | 0 | 0 | 0.0044 |
| SVOC | 2,4-Dinitrotoluene | SO | 8 | mg/kg | <0.014 | <0.014 | n.d. | n.d. | n.d. | n.d. | n.d. | 0 | 0 | 0 | 0 | 7.4 | 0 | 0 | 1.7 | 0 | 0 | 0.00032 |
| SVOC | 2,6-Dinitrotoluene | SO | 8 | mg/kg | <0.018 | <0.019 | n.d. | n.d. | n.d. | n.d. | n.d. | 0 | 0 | 0 | 0 | 1.5 | 0 | 0 | 0.36 | 0 | 0 | 0.000067 |
| SVOC | 2-Chloronaphthalene | SO | 8 | mg/kg | <0.0078 | <0.0083 | n.d. | n.d. | n.d. | n.d. | n.d. | 0 | 0 | 0.00 | 0 | 6000 | 0 | 0 | 480 | 0 | 0 | 0.39 |
| SVOC | 2-Chlorophenol | SO | 8 | mg/kg | <0.0088 | <0.0093 | n.d. | n.d. | n.d. | n.d. | n.d. | 0 | 0 | 0 | 0 | 580 | 0 | 0 | 39 | 0 | 0 | 0.0089 |
| SVOC | 2-Methylnaphthalene | SO | 8 | mg/kg | <0.0076 | <0.0081 | n.d. | n.d. | n.d. | n.d. | n.d. | 0 | 0 | 0.00 | 0 | 300 | 0 | 0 | 24 | 0 | 0 | 0.019 |
| SVOC | 2-Methylphenol | SO | 8 | mg/kg | <0.015 | <0.016 | n.d. | n.d. | n.d. | n.d. | n.d. | 0 | 0 | 0 | 0 | 4100 | 0 | 0 | 320 | 0 | 0 | 0.075 |
| SVOC | 2-Nitroaniline | SO | 8 | mg/kg | <0.011 | <0.012 | n.d. | n.d. | n.d. | n.d. | n.d. | 0 | 0 | 0.00 | 0 | 800 | 0 | 0 | 63 | 0 | 0 | 0.008 |
| SVOC | 2-Nitrophenol | SO | 8 | mg/kg | <0.012 | <0.012 | n.d. | n.d. | n.d. | n.d. | n.d. | 0 | 0 | - | - | - | - | - | - | - | - | - |
| SVOC | 3 & 4 Methylphenol | SO | 8 | mg/kg | <0.0092 | <0.0097 | n.d. | n.d. | n.d. | n.d. | n.d. | 0 | 0 | - | - | - | - | - | - | - | - | - |
| SVOC | 3,3'-Dichlorobenzidine | SO | 8 | mg/kg | <0.038 | <0.041 | n.d. | n.d. | n.d. | n.d. | n.d. | 0 | 0 | 0 | 0 | 5.1 | 0 | 0 | 1.2 | 0 | 0 | 0.00082 |
| SVOC | 3-Nitroaniline | SO | 8 | mg/kg | <0.01 | <0.011 | n.d. | n.d. | n.d. | n.d. | n.d. | 0 | 0 | - | - | - | - | - | - | - | - | - |
| SVOC | 4,6-Dinitro-2-methylphenol | SO | 8 | mg/kg | <0.092 | <0.098 | n.d. | n.d. | n.d. | n.d. | n.d. | 0 | 0 | 0 | 0 | 6.6 | 0 | 0 | 0.51 | 0 | 0 | 0.00026 |
| SVOC | 4-Bromophenyl phenyl ether | SO | 8 | mg/kg | <0.011 | <0.012 | n.d. | n.d. | n.d. | n.d. | n.d. | 0 | 0 | - | - | - | - | - | - | - | - | - |
| SVOC | 4-Chloro-3-methylphenol | SO | 8 | mg/kg | <0.015 | <0.016 | n.d. | n.d. | n.d. | n.d. | n.d. | 0 | 0 | 0 | 0 | 8200 | 0 | 0 | 630 | 0 | 0 | 0.17 |
| SVOC | 4-Chloroaniline | SO | 8 | mg/kg | <0.0089 | <0.0094 | n.d. | n.d. | n.d. | n.d. | n.d. | 0 | 0 | 0.00 | 0 | 11 | 0 | 0 | 2.7 | 0 | 0 | 0.00016 |
| SVOC | 4-Chlorophenyl phenyl ether | SO | 8 | mg/kg | <0.01 | <0.011 | n.d. | n.d. | n.d. | n.d. | n.d. | 0 | 0 | - | - | - | - | - | - | - | - | - |
| SVOC | 4-Nitroaniline | SO | 8 | mg/kg | <0.013 | <0.014 | n.d. | n.d. | n.d. | n.d. | n.d. | 0 | 0 | 0 | 0 | 110 | 0 | 0 | 25 | 0 | 0 | 0.0016 |
| SVOC | 4-Nitrophenol | SO | 8 | mg/kg | <0.17 | <0.18 | n.d. | n.d. | n.d. | n.d. | n.d. | 0 | 0 | - | - | - | - | - | - | - | - | - |
| SVOC | Acenaphthene | SO | 8 | mg/kg | <0.0083 | <0.0089 | n.d. | n.d. | n.d. | n.d. | n.d. | 0 | 0 | 0 | 0 | 4500 | 0 | 0 | 360 | 0 | 0 | 0.55 |
| SVOC | Acenaphthylene | SO | 8 | mg/kg | <0.0089 | <0.0094 | n.d. | n.d. | n.d. | n.d. | n.d. | 0 | 0 | - | - | - | - | - | - | - | - | - |
| SVOC | Acetophenone | SO | 8 | mg/kg | <0.0075 | <0.008 | n.d. | n.d. | n.d. | n.d. | n.d. | 0 | 0 | 0 | 0 | 12000 | 0 | 0 | 780 | 0 | 0 | 0.058 |
| SVOC | Anthracene | SO | 8 | mg/kg | <0.033 | <0.035 | n.d. | n.d. | n.d. | n.d. | n.d. | 0 | 0 | 0.00 | 0 | 23000 | 0 | 0 | 1800 | 0 | 0 | 5.8 |
| SVOC | Atrazine | SO | 8 | mg/kg | <0.015 | <0.016 | n.d. | n.d. | n.d. | n.d. | n.d. | 0 | 0 | 0 | 0 | 10 | 0 | 0 | 2.4 | 0 | 0 | 0.0002 |
| SVOC | Benzaldehyde | SO | 8 | mg/kg | <0.026 | <0.028 | n.d. | n.d. | n.d. | n.d. | n.d. | 0 | 0 | 0 | 0 | 820 | 0 | 0 | 170 | 0 | 0 | 0.0041 |
| SVOC | Benzo[a]anthracene | SO | 8 | mg/kg | <0.029 | <0.031 | n.d. | n.d. | n.d. | n.d. | n.d. | 0 | 0 | 0 | 0 | 2.9 | 0 | 0 | 0.16 | 0 | 0 | 0.0042 |
| SVOC | Benzo[a]pyrene | SO | 8 | mg/kg | <0.01 | <0.011 | n.d. | n.d. | n.d. | n.d. | n.d. | 0 | 0 | 0 | 0 | 0.29 | 0 | 0 | 0.016 | 0 | 0 | 0.004 |
| SVOC | Benzo[b]fluoranthene | SO | 8 | mg/kg | <0.013 | <0.014 | n.d. | n.d. | n.d. | n.d. | n.d. | 0 | 0 | 0.00 | 0 | 2.9 | 0 | 0 | 0.16 | 0 | 0 | 0.041 |
| SVOC | Benzo[g,h,i]perylene | SO | 8 | mg/kg | <0.02 | <0.021 | n.d. | n.d. | n.d. | n.d. | n.d. | 0 | 0 | - | - | - | - | - | - | - | - | - |
| SVOC | Benzo[k]fluoranthene | SO | 8 | mg/kg | <0.015 | <0.016 | n.d. | n.d. | n.d. | n.d. | n.d. | 0 | 0 | 0 | 0 | 29 | 0 | 0 | 1.6 | 0 | 0 | 0.4 |

**Table 17. Background Intermediate Depth Soil Analytical Results Statistical Summary**
**Columbia Falls Aluminum Company, LLC, Phase I Site Characterization, 2000 Aluminum Drive, Columbia Falls, MT**

| Group | Analyte | Matrix | No. of Results | Unit | Min | Max | Mean | Median | Standard Deviation | 5th Percentile | 95th Percentile | # > LOD | % > LOD | Industrial RSL No. Exceeding | Industrial RSL % Exceeding | Industrial RSL Action Level | Residential RSL No. Exceeding | Residential RSL % Exceeding | Residential RSL Action Level | Risk SSL No. Exceeding | Risk SSL % Exceeding | Risk SSL Action Level |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| SVOC | Bis(2-chloroethoxy)methane | SO | 8 | mg/kg | <0.011 | <0.011 | n.d. | n.d. | n.d. | n.d. | n.d. | 0 | 0 | 0 | 0 | 250 | 0 | 0 | 19 | 0 | 0 | 0.0013 |
| SVOC | Bis(2-chloroethyl)ether | SO | 8 | mg/kg | <0.0081 | <0.0086 | n.d. | n.d. | n.d. | n.d. | n.d. | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0.23 | 0 | 0 | 0.0000036 |
| SVOC | Bis(2-ethylhexyl) phthalate | SO | 8 | mg/kg | <0.013 | <0.014 | n.d. | n.d. | n.d. | n.d. | n.d. | 0 | 0 | 0 | 0 | 160 | 0 | 0 | 39 | 0 | 0 | 1.3 |
| SVOC | Butyl benzyl phthalate | SO | 8 | mg/kg | <0.011 | <0.011 | n.d. | n.d. | n.d. | n.d. | n.d. | 0 | 0 | 0 | 0 | 1200 | 0 | 0 | 290 | 0 | 0 | 0.24 |
| SVOC | Caprolactam | SO | 8 | mg/kg | <0.025 | <0.026 | n.d. | n.d. | n.d. | n.d. | n.d. | 0 | 0 | 0 | 0 | 40000 | 0 | 0 | 3100 | 0 | 0 | 0.25 |
| SVOC | Carbazole | SO | 8 | mg/kg | <0.0085 | <0.0091 | n.d. | n.d. | n.d. | n.d. | n.d. | 0 | 0 | - | - | - | - | - | - | - | - | - |
| SVOC | Chrysene | SO | 8 | mg/kg | <0.0094 | <0.01 | n.d. | n.d. | n.d. | n.d. | n.d. | 0 | 0 | 0 | 0 | 290 | 0 | 0 | 16 | 0 | 0 | 1.2 |
| SVOC | Dibenz(a,h)anthracene | SO | 8 | mg/kg | <0.018 | <0.019 | n.d. | n.d. | n.d. | n.d. | n.d. | 0 | 0 | 0 | 0 | 0.29 | 0 | 0 | 0.016 | 0 | 0 | 0.013 |
| SVOC | Dibenzofuran | SO | 8 | mg/kg | <0.01 | <0.011 | n.d. | n.d. | n.d. | n.d. | n.d. | 0 | 0 | 0 | 0 | 100 | 0 | 0 | 7.3 | 0 | 0 | 0.015 |
| SVOC | Diethyl phthalate | SO | 8 | mg/kg | <0.0098 | <0.01 | n.d. | n.d. | n.d. | n.d. | n.d. | 0 | 0 | 0.00 | 0 | 66000 | 0 | 0 | 5100 | 0 | 0 | 0.61 |
| SVOC | Dimethyl phthalate | SO | 8 | mg/kg | <0.01 | <0.011 | n.d. | n.d. | n.d. | n.d. | n.d. | 0 | 0 | - | - | - | - | - | - | - | - | - |
| SVOC | Di-n-butyl phthalate | SO | 8 | mg/kg | <0.01 | 0.011 | n.d. | n.d. | n.d. | n.d. | 0.01 | 1 | 13 | 0 | 0 | 8200 | 0 | 0 | 630 | 0 | 0 | 0.23 |
| SVOC | Di-n-octyl phthalate | SO | 8 | mg/kg | <0.018 | <0.019 | n.d. | n.d. | n.d. | n.d. | n.d. | 0 | 0 | 0 | 0 | 820 | 0 | 0 | 63 | 0 | 0 | 5.7 |
| SVOC | Fluoranthene | SO | 8 | mg/kg | <0.01 | <0.011 | n.d. | n.d. | n.d. | n.d. | n.d. | 0 | 0 | 0 | 0 | 3000 | 0 | 0 | 240 | 0 | 0 | 8.9 |
| SVOC | Fluorene | SO | 8 | mg/kg | <0.0075 | <0.008 | n.d. | n.d. | n.d. | n.d. | n.d. | 0 | 0 | 0 | 0 | 3000 | 0 | 0 | 240 | 0 | 0 | 0.54 |
| SVOC | Hexachlorobenzene | SO | 8 | mg/kg | <0.014 | <0.015 | n.d. | n.d. | n.d. | n.d. | n.d. | 0 | 0 | 0 | 0 | 0.96 | 0 | 0 | 0.21 | 0 | 0 | 0.00012 |
| SVOC | Hexachlorobutadiene | SO | 8 | mg/kg | <0.0097 | <0.01 | n.d. | n.d. | n.d. | n.d. | n.d. | 0 | 0 | 0 | 0 | 5.3 | 0 | 0 | 1.2 | 0 | 0 | 0.00027 |
| SVOC | Hexachlorocyclopentadiene | SO | 8 | mg/kg | <0.021 | <0.023 | n.d. | n.d. | n.d. | n.d. | n.d. | 0 | 0 | 0 | 0 | 0.75 | 0 | 0 | 0.18 | 0 | 0 | 0.00013 |
| SVOC | Hexachloroethane | SO | 8 | mg/kg | <0.013 | <0.013 | n.d. | n.d. | n.d. | n.d. | n.d. | 0 | 0 | 0 | 0 | 8 | 0 | 0 | 1.8 | 0 | 0 | 0.0002 |
| SVOC | Indeno[1,2,3-cd]pyrene | SO | 8 | mg/kg | <0.023 | <0.024 | n.d. | n.d. | n.d. | n.d. | n.d. | 0 | 0 | 0 | 0 | 2.9 | 0 | 0 | 0.16 | 0 | 0 | 0.13 |
| SVOC | Isophorone | SO | 8 | mg/kg | <0.0074 | <0.0079 | n.d. | n.d. | n.d. | n.d. | n.d. | 0 | 0 | 0 | 0 | 2400 | 0 | 0 | 570 | 0 | 0 | 0.026 |
| SVOC | Naphthalene | SO | 8 | mg/kg | <0.0088 | <0.0093 | n.d. | n.d. | n.d. | n.d. | n.d. | 0 | 0 | 0 | 0 | 17 | 0 | 0 | 3.8 | 0 | 0 | 0.00054 |
| SVOC | Nitrobenzene | SO | 8 | mg/kg | <0.011 | <0.012 | n.d. | n.d. | n.d. | n.d. | n.d. | 0 | 0 | 0.00 | 0 | 22 | 0 | 0 | 5.1 | 0 | 0 | 0.000092 |
| SVOC | N-Nitrosodi-n-propylamine | SO | 8 | mg/kg | <0.012 | <0.012 | n.d. | n.d. | n.d. | n.d. | n.d. | 0 | 0 | 0.00 | 0 | 0.33 | 0 | 0 | 0.078 | 0 | 0 | 0.0000081 |
| SVOC | N-Nitrosodiphenylamine | SO | 8 | mg/kg | <0.031 | <0.033 | n.d. | n.d. | n.d. | n.d. | n.d. | 0 | 0 | 0 | 0 | 470 | 0 | 0 | 110 | 0 | 0 | 0.067 |
| SVOC | Pentachlorophenol | SO | 8 | mg/kg | <0.042 | <0.044 | n.d. | n.d. | n.d. | n.d. | n.d. | 0 | 0 | 0 | 0 | 4 | 0 | 0 | 1 | 0 | 0 | 0.000057 |
| SVOC | Phenanthrene | SO | 8 | mg/kg | <0.0092 | <0.0097 | n.d. | n.d. | n.d. | n.d. | n.d. | 0 | 0 | - | - | - | - | - | - | - | - | - |
| SVOC | Phenol | SO | 8 | mg/kg | <0.011 | <0.012 | n.d. | n.d. | n.d. | n.d. | n.d. | 0 | 0 | 0 | 0 | 25000 | 0 | 0 | 1900 | 0 | 0 | 0.33 |
| SVOC | Pyrene | SO | 8 | mg/kg | <0.016 | <0.017 | n.d. | n.d. | n.d. | n.d. | n.d. | 0 | 0 | 0 | 0 | 2300 | 0 | 0 | 180 | 0 | 0 | 1.3 |
| VOC | 1,1,1-Trichloroethane | SO | 8 | mg/kg | <0.00033 | <0.00041 | n.d. | n.d. | n.d. | n.d. | n.d. | 0 | 0 | 0 | 0 | 3600 | 0 | 0 | 810 | 0 | 0 | 0.28 |
| VOC | 1,1,2,2-Tetrachloroethane | SO | 8 | mg/kg | <0.00015 | <0.00019 | n.d. | n.d. | n.d. | n.d. | n.d. | 0 | 0 | 0 | 0 | 2.7 | 0 | 0 | 0.6 | 0 | 0 | 0.00003 |
| VOC | 1,1,2-Trichloro-1,2,2-trifluoroethane | SO | 8 | mg/kg | <0.00039 | <0.00048 | n.d. | n.d. | n.d. | n.d. | n.d. | 0 | 0 | 0 | 0 | 17000 | 0 | 0 | 4000 | 0 | 0 | 14 |
| VOC | 1,1,2-Trichloroethane | SO | 8 | mg/kg | <0.00025 | <0.00031 | n.d. | n.d. | n.d. | n.d. | n.d. | 0 | 0 | 0 | 0 | 0.63 | 0 | 0 | 0.15 | 0 | 0 | 0.000013 |
| VOC | 1,1-Dichloroethane | SO | 8 | mg/kg | <0.0003 | <0.00037 | n.d. | n.d. | n.d. | n.d. | n.d. | 0 | 0 | 0 | 0 | 16 | 0 | 0 | 3.6 | 0 | 0 | 0.00078 |
| VOC | 1,1-Dichloroethene | SO | 8 | mg/kg | <0.00036 | <0.00045 | n.d. | n.d. | n.d. | n.d. | n.d. | 0 | 0 | 0 | 0 | 100 | 0 | 0 | 23 | 0 | 0 | 0.01 |
| VOC | 1,2,3-Trichlorobenzene | SO | 8 | mg/kg | <9.6E-05 | <0.00012 | n.d. | n.d. | n.d. | n.d. | n.d. | 0 | 0 | 0 | 0 | 93 | 0 | 0 | 6.3 | 0 | 0 | 0.0021 |
| VOC | 1,2,4-Trichlorobenzene | SO | 8 | mg/kg | <0.00028 | <0.00035 | n.d. | n.d. | n.d. | n.d. | n.d. | 0 | 0 | 0 | 0 | 26 | 0 | 0 | 5.8 | 0 | 0 | 0.0012 |

**Table 17. Background Intermediate Depth Soil Analytical Results Statistical Summary**
**Columbia Falls Aluminum Company, LLC, Phase I Site Characterization, 2000 Aluminum Drive, Columbia Falls, MT**

| | | | | | | | | | | | | | | Industrial RSL | | | Residential RSL | | | Risk SSL | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Group | Analyte | Matrix | No. of Results | Unit | Min | Max | Mean | Median | Standard Deviation | 5th Percentile | 95th Percentile | # > LOD | % > LOD | No. Exceeding | % Exceeding | Action Level | No. Exceeding | % Exceeding | Action Level | No. Exceeding | % Exceeding | Action Level |
| VOC | 1,2-Dibromo-3-Chloropropane | SO | 8 | mg/kg | <0.00041 | <0.00051 | n.d. | n.d. | n.d. | n.d. | n.d. | 0 | 0 | 0 | 0 | 0.064 | 0 | 0 | 0.0053 | 0 | 0 | 0.00000014 |
| VOC | 1,2-Dichlorobenzene | SO | 8 | mg/kg | <0.00012 | <0.00015 | n.d. | n.d. | n.d. | n.d. | n.d. | 0 | 0 | 0 | 0 | 930 | 0 | 0 | 180 | 0 | 0 | 0.03 |
| VOC | 1,2-Dichloroethane | SO | 8 | mg/kg | <9.6E-05 | <0.00012 | n.d. | n.d. | n.d. | n.d. | n.d. | 0 | 0 | 0 | 0 | 2 | 0 | 0 | 0.46 | 0 | 0 | 0.000048 |
| VOC | 1,2-Dichloropropane | SO | 8 | mg/kg | <0.00015 | <0.00019 | n.d. | n.d. | n.d. | n.d. | n.d. | 0 | 0 | 0 | 0 | 4.4 | 0 | 0 | 1 | 0 | 0 | 0.00015 |
| VOC | 1,3-Dichlorobenzene | SO | 8 | mg/kg | <0.00011 | <0.00013 | n.d. | n.d. | n.d. | n.d. | n.d. | 0 | 0 | - | - | - | - | - | - | - | - | - |
| VOC | 1,4-Dichlorobenzene | SO | 8 | mg/kg | <0.00011 | <0.00014 | n.d. | n.d. | n.d. | n.d. | n.d. | 0 | 0 | 0.00 | 0 | 11 | 0 | 0 | 2.6 | 0 | 0 | 0.00046 |
| VOC | 2-Butanone (MEK) | SO | 8 | mg/kg | <0.00067 | <0.00084 | n.d. | n.d. | n.d. | n.d. | n.d. | 0 | 0 | 0 | 0 | 19000 | 0 | 0 | 2700 | 0 | 0 | 0.12 |
| VOC | 2-Hexanone | SO | 8 | mg/kg | <0.00082 | <0.001 | n.d. | n.d. | n.d. | n.d. | n.d. | 0 | 0 | 0 | 0 | 130 | 0 | 0 | 20 | 0 | 0 | 0.00088 |
| VOC | 4-Methyl-2-pentanone (MIBK) | SO | 8 | mg/kg | <0.0019 | <0.0024 | n.d. | n.d. | n.d. | n.d. | n.d. | 0 | 0 | 0 | 0 | 14000 | 0 | 0 | 3300 | 0 | 0 | 0.14 |
| VOC | Acetone | SO | 8 | mg/kg | 0.0057 | 0.022 | 0.01 | 0.01 | 0.01 | 0.01 | 0.02 | 8 | 100 | 0 | 0 | 67000 | 0 | 0 | 6100 | 0 | 0 | 0.29 |
| VOC | Benzene | SO | 8 | mg/kg | <0.00022 | 0.00091 | 0.00 | 0.00 | 0.00 | n.d. | 0.00 | 7 | 88 | 0 | 0 | 5.1 | 0 | 0 | 1.2 | 5 | 63 | 0.00023 |
| VOC | Bromoform | SO | 8 | mg/kg | <0.00011 | <0.00014 | n.d. | n.d. | n.d. | n.d. | n.d. | 0 | 0 | 0 | 0 | 86 | 0 | 0 | 19 | 0 | 0 | 0.00087 |
| VOC | Bromomethane | SO | 8 | mg/kg | <0.00028 | <0.00035 | n.d. | n.d. | n.d. | n.d. | n.d. | 0 | 0 | 0 | 0 | 3 | 0 | 0 | 0.68 | 0 | 0 | 0.00019 |
| VOC | Carbon disulfide | SO | 8 | mg/kg | <0.0004 | 0.00079 | 0.00 | n.d. | 0.00 | n.d. | 0.00 | 3 | 38 | 0 | 0 | 350 | 0 | 0 | 77 | 0 | 0 | 0.024 |
| VOC | Carbon tetrachloride | SO | 8 | mg/kg | <0.00038 | <0.00047 | n.d. | n.d. | n.d. | n.d. | n.d. | 0 | 0 | 0 | 0 | 2.9 | 0 | 0 | 0.65 | 0 | 0 | 0.00018 |
| VOC | Chlorobenzene | SO | 8 | mg/kg | <0.00012 | <0.00015 | n.d. | n.d. | n.d. | n.d. | n.d. | 0 | 0 | 0 | 0 | 130 | 0 | 0 | 28 | 0 | 0 | 0.0053 |
| VOC | Chlorobromomethane | SO | 8 | mg/kg | <0.00015 | <0.00019 | n.d. | n.d. | n.d. | n.d. | n.d. | 0 | 0 | 0 | 0 | 63 | 0 | 0 | 15 | 0 | 0 | 0.0021 |
| VOC | Chlorodibromomethane | SO | 8 | mg/kg | <0.00013 | <0.00016 | n.d. | n.d. | n.d. | n.d. | n.d. | 0 | 0 | 0 | 0 | 39 | 0 | 0 | 8.3 | 0 | 0 | 0.00023 |
| VOC | Chloroethane | SO | 8 | mg/kg | <0.00031 | <0.00038 | n.d. | n.d. | n.d. | n.d. | n.d. | 0 | 0 | 0 | 0 | 5700 | 0 | 0 | 1400 | 0 | 0 | 0.59 |
| VOC | Chloroform | SO | 8 | mg/kg | <0.00018 | <0.00023 | n.d. | n.d. | n.d. | n.d. | n.d. | 0 | 0 | 0 | 0 | 1.4 | 0 | 0 | 0.32 | 0 | 0 | 0.000061 |
| VOC | Chloromethane | SO | 8 | mg/kg | <0.00033 | <0.00041 | n.d. | n.d. | n.d. | n.d. | n.d. | 0 | 0 | 0 | 0 | 46 | 0 | 0 | 11 | 0 | 0 | 0.0049 |
| VOC | cis-1,2-Dichloroethene | SO | 8 | mg/kg | <0.00019 | <0.00024 | n.d. | n.d. | n.d. | n.d. | n.d. | 0 | 0 | 0 | 0 | 230 | 0 | 0 | 16 | 0 | 0 | 0.0011 |
| VOC | cis-1,3-Dichloropropene | SO | 8 | mg/kg | <0.00013 | <0.00016 | n.d. | n.d. | n.d. | n.d. | n.d. | 0 | 0 | - | - | - | - | - | - | - | - | - |
| VOC | Cyclohexane | SO | 8 | mg/kg | <0.0004 | 0.0018 | 0.00 | 0.00 | 0.00 | n.d. | 0.00 | 4 | 50 | 0 | 0 | 2700 | 0 | 0 | 650 | 0 | 0 | 1.3 |
| VOC | Dichlorobromomethane | SO | 8 | mg/kg | <0.00033 | <0.00041 | n.d. | n.d. | n.d. | n.d. | n.d. | 0 | 0 | 0 | 0 | 1.3 | 0 | 0 | 0.29 | 0 | 0 | 0.000036 |
| VOC | Dichlorodifluoromethane | SO | 8 | mg/kg | <0.00028 | <0.00035 | n.d. | n.d. | n.d. | n.d. | n.d. | 0 | 0 | 0 | 0 | 37 | 0 | 0 | 8.7 | 0 | 0 | 0.03 |
| VOC | Ethylbenzene | SO | 8 | mg/kg | <0.00016 | 0.00098 | 0.00 | 0.00 | 0.00 | n.d. | 0.00 | 4 | 50 | 0 | 0 | 25 | 0 | 0 | 5.8 | 0 | 0 | 0.0017 |
| VOC | Ethylene Dibromide | SO | 8 | mg/kg | <0.00011 | <0.00013 | n.d. | n.d. | n.d. | n.d. | n.d. | 0 | 0 | 0 | 0 | 0.16 | 0 | 0 | 0.036 | 0 | 0 | 0.0000021 |
| VOC | Isopropylbenzene | SO | 8 | mg/kg | <0.00015 | <0.00019 | n.d. | n.d. | n.d. | n.d. | n.d. | 0 | 0 | 0 | 0 | 990 | 0 | 0 | 190 | 0 | 0 | 0.074 |
| VOC | Methyl acetate | SO | 8 | mg/kg | <0.00081 | 0.0096 | 0.00 | n.d. | 0.00 | n.d. | 0.01 | 2 | 25 | 0.00 | 0 | 120000 | 0 | 0 | 7800 | 0 | 0 | 0.41 |
| VOC | Methyl tert-butyl ether | SO | 8 | mg/kg | <0.00015 | <0.00019 | n.d. | n.d. | n.d. | n.d. | n.d. | 0 | 0 | 0.00 | 0 | 210 | 0 | 0 | 47 | 0 | 0 | 0.0032 |
| VOC | Methylcyclohexane | SO | 8 | mg/kg | <0.00044 | 0.0055 | 0.00 | 0.00 | 0.00 | n.d. | 0.01 | 6 | 75 | - | - | - | - | - | - | - | - | - |
| VOC | Methylene Chloride | SO | 8 | mg/kg | <0.00028 | <0.00035 | n.d. | n.d. | n.d. | n.d. | n.d. | 0 | 0 | 0 | 0 | 320 | 0 | 0 | 35 | 0 | 0 | 0.0027 |
| VOC | m-Xylene & p-Xylene | SO | 8 | mg/kg | <9.6E-05 | 0.0032 | 0.00 | 0.00 | 0.00 | n.d. | 0.00 | 4 | 50 | 0 | 0 | 240 | 0 | 0 | 56 | - | - | - |
| VOC | o-Xylene | SO | 8 | mg/kg | <0.00014 | 0.00093 | 0.00 | n.d. | 0.00 | n.d. | 0.00 | 3 | 38 | 0 | 0 | 280 | 0 | 0 | 65 | 0 | 0 | 0.019 |
| VOC | Styrene | SO | 8 | mg/kg | <0.00013 | <0.00016 | n.d. | n.d. | n.d. | n.d. | n.d. | 0 | 0 | 0.00 | 0 | 3500 | 0 | 0 | 600 | 0 | 0 | 0.13 |
| VOC | Tetrachloroethene | SO | 8 | mg/kg | <0.00025 | <0.00031 | n.d. | n.d. | n.d. | n.d. | n.d. | 0 | 0 | 0 | 0 | 39 | 0 | 0 | 8.1 | 0 | 0 | 0.0018 |

**Table 17. Background Intermediate Depth Soil Analytical Results Statistical Summary**
**Columbia Falls Aluminum Company, LLC, Phase I Site Characterization, 2000 Aluminum Drive, Columbia Falls, MT**

| | | | | | | | | | | | | | | Industrial RSL | | | Residential RSL | | | Risk SSL | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Group | Analyte | Matrix | No. of Results | Unit | Min | Max | Mean | Median | Standard Deviation | 5th Percentile | 95th Percentile | # > LOD | % > LOD | No. Exceeding | % Exceeding | Action Level | No. Exceeding | % Exceeding | Action Level | No. Exceeding | % Exceeding | Action Level |
| VOC | Toluene | SO | 8 | mg/kg | 0.00033 | 0.0051 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 8 | 100 | 0 | 0 | 4700 | 0 | 0 | 490 | 0 | 0 | 0.076 |
| VOC | trans-1,2-Dichloroethene | SO | 8 | mg/kg | <0.00034 | <0.00043 | n.d. | n.d. | n.d. | n.d. | n.d. | 0 | 0 | 0 | 0 | 2300 | 0 | 0 | 160 | 0 | 0 | 0.011 |
| VOC | trans-1,3-Dichloropropene | SO | 8 | mg/kg | <8.8E-05 | <0.00011 | n.d. | n.d. | n.d. | n.d. | n.d. | 0 | 0 | - | - | - | - | - | - | - | - | - |
| VOC | Trichloroethene | SO | 8 | mg/kg | <0.00023 | <0.00028 | n.d. | n.d. | n.d. | n.d. | n.d. | 0 | 0 | 0 | 0 | 1.9 | 0 | 0 | 0.41 | 0 | 0 | 0.0001 |
| VOC | Trichlorofluoromethane | SO | 8 | mg/kg | <0.0003 | <0.00037 | n.d. | n.d. | n.d. | n.d. | n.d. | 0 | 0 | 0 | 0 | 35000 | 0 | 0 | 2300 | 0 | 0 | 0.33 |
| VOC | Vinyl chloride | SO | 8 | mg/kg | <0.00034 | <0.00043 | n.d. | n.d. | n.d. | n.d. | n.d. | 0 | 0 | 0 | 0 | 1.7 | 0 | 0 | 0.059 | 0 | 0 | 0.0000065 |

mg/kg - Milligrams per Kilograms
n.d - Non Detect
LOD - Limit of Detection
Industiral RSL - Environmental Protection Agency Industrial Soil Regional Screening Level
Residential RSL - Environmental Protection Agency Residnetial Soil Regional Screening Level
Risk SSL - Environmental Protection Agency Human Health Protection of Ground Water - Risk-based Soil Screening Level

**Table 18. Background Summary Table (Phase I Characterization vs Montana Regional**
**Columbia Falls Aluminum Company, LLC, Phase I Site Characterization, 2000 Aluminum Drive, Columbia Falls, MT**

| | Surface (0-0.5 ft-bls) | | | | Shallow (0.5-2 ft-bls) | | | Intermediate-Depth (10-12 ft-bls) | | |
|---|---|---|---|---|---|---|---|---|---|---|
| Analytical Parameter | Phase I Background Area 95% UCL (mg/kg) | Phase I Background Area Non-Parametric UTL/Max (mg/kg) | Phase I Background Area UTL (mg/kg) | MBSI Surface Soil UTL (mg/kg) | Phase I Background Area 95% UCL (mg/kg) | Phase I Background Area Non-Parametric UTL/Max (mg/kg) | Phase I Background Area UTL (mg/kg) | Phase I Background Area 95% UCL (mg/kg) | Phase I Background Area Non-Parametric UTL/Max (mg/kg) | Phase I Background Area UTL (mg/kg) |
| **Aluminum** | 24,357 | 29,200 | 33568 | 25941 | 22307 | 30900 | 35085 | 9465 | 13800 | 17587 |
| **Arsenic** | 6.0 | 7.1 | 9.697 | 22.5 | 5.952 | 6.8 | 10.42 | 4.67 | 5.3 | 7.814 |
| **Barium** | 364.5 | 429 | 588.7 | 429 | 323.9 | 440 | 625.2 | 103 | 172 | 222.5 |
| **Beryllium** | 0.989 | 1.2 | 1.486 | 1.1 | 0.883 | 1.2 | 1.627 | 0.417 | 0.49 | 0.676 |
| **Calcium** | 10949 | 17200 | 20457 | NA | 6377 | 10900 | 14165 | 23017 | 32300 | 48647 |
| **Chromium** | 16.05 | 18.3 | 30.11 | 41.7 | 16.12 | 20.9 | 31.73 | 14.05 | 21.3 | 26.51 |
| **Cobalt** | 6.85 | 7.2 | 9.385 | 10 | 7.071 | 7.4 | 11.91 | 5.174 | 5.7 | 7.453 |
| **Copper** | 21.92 | 27 | 39.08 | 165 | 19.2 | 23 | 32.84 | 13.79 | 17.4 | 28.06 |
| **Iron** | 18950 | 19900 | 25894 | 24400 | 18295 | 19200 | 25127 | 13274 | 15000 | 20056 |
| **Lead** | 14.82 | 15.9 | 24.03 | 29.8 | 17.25 | 21.2 | 34.72 | 7.207 | 7.9 | 11.95 |
| **Magnesium** | 10293 | 11400 | 20331 | NA | 10104 | 10700 | -- | 10615 | 12100 | -- |
| **Manganese** | 490.9 | 576 | 1432 | 880 | 541.6 | 659 | 893.8 | 493.9 | 642 | 1100 |
| **Mercury** | 0.0284 | 0.036 | 0.0509 | NA | 0.0276 | 0.039 | 0.0566 | 0.0187 | 0.026 | 0.0315 |
| **Nickel** | 13.85 | 14.2 | 21.47 | 31.4 | 13.01 | 14.2 | 20.76 | 10.3 | 11.6 | 16.44 |
| **Potassium** | 1294 | 1510 | 2192 | NA | 1148 | 1340 | 2017 | 716.9 | 788 | 1057 |
| **Selenium** | 0.735 | 0.93 | 1.908 | 0.7 | -- | -- | -- | -- | -- | -- |
| **Sodium** | 337.1 | 552 | 578.2 | NA | 417.5 | 555 | 606 | -- | -- | -- |
| **Vanadium** | 15.04 | 16.5 | 22.96 | 52.6 | 13.8 | 15.1 | 20.04 | 9.329 | 10.5 | 14.66 |
| **Zinc** | 69.42 | 79.6 | 158.4 | 118 | 54.78 | 59.9 | 117.4 | 33.32 | 41.3 | 52.1 |

NA - value not provided by MSBI
-- - insufficient amount of data to calculate statistic due to non-detect values
ft-bls - Feet Below Land Surface
MBSI - Montana Background Soils Investigation
mg/kg - Milligrams per Kilograms
UCL - Upper Confidence Limit
UTL - Upper Tolerance Limit

**Table 19. Borrow Pit Area Surface Soil Analytical Results Statistical Summary**
**Columbia Falls Aluminum Company, LLC, Phase I Site Characterization, 2000 Aluminum Drive, Columbia Falls, MT**

| | | | | | | | | | | | | | | Industrial RSL | | | Residential RSL | | | Risk SSL | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Group | Analyte | Matrix | No. of Results | Unit | Min | Max | Mean | Median | Standard Deviation | 5th Percentile | 95th Percentile | # > LOD | % > LOD | No. Exceeding | % Exceeding | Action Level | No. Exceeding | % Exceeding | Action Level | No. Exceeding | % Exceeding | Action Level |
| GENCHEM | Fluoride | SO | 7 | mg/kg | 17.3 | 61.4 | 28.86 | 22.20 | 15.68 | 17.96 | 54.02 | 7 | 100 | 0 | 0 | 4700 | 0 | 0 | 310 | 7 | 100 | 12 |
| METALS | Aluminum | SO | 7 | mg/kg | 12000 | 21300 | 16371.43 | 17100.00 | 3474.53 | 12150.00 | 20550.00 | 7 | 100 | 0 | 0 | 110000 | 7 | 100 | 7700 | 7 | 100 | 3000 |
| METALS | Antimony | SO | 7 | mg/kg | <0.28 | <0.45 | n.d. | n.d. | n.d. | n.d. | n.d. | 0 | 0 | 0 | 0 | 47 | 0 | 0 | 3.1 | 0 | 0 | 0.035 |
| METALS | Arsenic | SO | 7 | mg/kg | 3 | 6 | 4.44 | 4.30 | 0.94 | 3.27 | 5.70 | 7 | 100 | 6 | 86 | 3 | 7 | 100 | 0.68 | 7 | 100 | 0.0015 |
| METALS | Barium | SO | 7 | mg/kg | 152 | 267 | 212.57 | 217.00 | 44.42 | 159.20 | 266.70 | 7 | 100 | 0 | 0 | 22000 | 0 | 0 | 1500 | 7 | 100 | 16 |
| METALS | Beryllium | SO | 7 | mg/kg | 0.25 | 0.65 | 0.49 | 0.52 | 0.14 | 0.30 | 0.63 | 7 | 100 | 0 | 0 | 230 | 0 | 0 | 16 | 0 | 0 | 1.9 |
| METALS | Cadmium | SO | 7 | mg/kg | <0.3 | <0.48 | n.d. | n.d. | n.d. | n.d. | n.d. | 0 | 0 | 0 | 0 | 98 | 0 | 0 | 7.1 | 0 | 0 | 0.069 |
| METALS | Calcium | SO | 7 | mg/kg | 1730 | 2930 | 2172.86 | 2150.00 | 384.70 | 1787.00 | 2741.00 | 7 | 100 | - | - | - | - | - | - | - | - | - |
| METALS | Chromium | SO | 7 | mg/kg | 8.4 | 15.8 | 10.61 | 9.70 | 2.45 | 8.67 | 14.45 | 7 | 100 | - | - | - | - | - | - | - | - | - |
| METALS | Cobalt | SO | 7 | mg/kg | 4.4 | 6.2 | 5.11 | 5.00 | 0.61 | 4.43 | 5.96 | 7 | 100 | 0 | 0 | 35 | 7 | 100 | 2.3 | 7 | 100 | 0.027 |
| METALS | Copper | SO | 7 | mg/kg | 6 | 25.5 | 9.86 | 7.60 | 6.94 | 6.21 | 20.34 | 7 | 100 | 0 | 0 | 4700 | 0 | 0 | 310 | 7 | 100 | 2.8 |
| METALS | Cyanide, Total | SO | 7 | mg/kg | <0.048 | 0.45 | 0.15 | 0.11 | 0.15 | n.d. | 0.40 | 6 | 86 | 0 | 0 | 15 | 0 | 0 | 2.3 | 6 | 86 | 0.0015 |
| METALS | Iron | SO | 7 | mg/kg | 11200 | 21800 | 15728.57 | 16000.00 | 3280.10 | 11890.00 | 20240.00 | 7 | 100 | 0.00 | 0 | 82000 | 7 | 100 | 5500 | 7 | 100 | 35 |
| METALS | Lead | SO | 7 | mg/kg | 7.9 | 13.9 | 11.01 | 11.30 | 2.31 | 8.08 | 13.78 | 7 | 100 | 0.00 | 0 | 800 | 0 | 0 | 400 | - | - | - |
| METALS | Magnesium | SO | 7 | mg/kg | 5940 | 12500 | 8238.57 | 8350.00 | 2169.74 | 6108.00 | 11381.00 | 7 | 100 | - | - | - | - | - | - | - | - | - |
| METALS | Manganese | SO | 7 | mg/kg | 260 | 877 | 629.43 | 714.00 | 215.05 | 329.90 | 855.40 | 7 | 100 | 0 | 0 | 2600 | 7 | 100 | 180 | 7 | 100 | 2.8 |
| METALS | Mercury | SO | 7 | mg/kg | <0.013 | 0.068 | 0.03 | 0.02 | 0.02 | n.d. | 0.06 | 6 | 86 | 0 | 0 | 4.6 | 0 | 0 | 1.1 | 6 | 86 | 0.0033 |
| METALS | Nickel | SO | 7 | mg/kg | 10.2 | 17 | 13.37 | 13.00 | 2.89 | 10.32 | 16.82 | 7 | 100 | 0 | 0 | 2200 | 0 | 0 | 150 | 7 | 100 | 2.6 |
| METALS | Potassium | SO | 7 | mg/kg | 846 | 1500 | 1107.14 | 1020.00 | 255.80 | 864.60 | 1479.00 | 7 | 100 | - | - | - | - | - | - | - | - | - |
| METALS | Selenium | SO | 7 | mg/kg | <0.26 | <0.42 | n.d. | n.d. | n.d. | n.d. | n.d. | 0 | 0 | 0 | 0 | 580 | 0 | 0 | 39 | 0 | 0 | 0.052 |
| METALS | Silver | SO | 7 | mg/kg | <0.55 | <0.89 | n.d. | n.d. | n.d. | n.d. | n.d. | 0 | 0 | 0 | 0 | 580 | 0 | 0 | 39 | 0 | 0 | 0.08 |
| METALS | Sodium | SO | 7 | mg/kg | <38.5 | 90.6 | 42.00 | 46.50 | 32.44 | n.d. | 83.88 | 5 | 71 | - | - | - | - | - | - | - | - | - |
| METALS | Thallium | SO | 7 | mg/kg | <0.11 | <0.18 | n.d. | n.d. | n.d. | n.d. | n.d. | 0 | 0 | 0 | 0 | 1.2 | 0 | 0 | 0.078 | 0 | 0 | 0.0014 |
| METALS | Vanadium | SO | 7 | mg/kg | 9.9 | 16.7 | 13.46 | 12.90 | 2.14 | 10.71 | 16.10 | 7 | 100 | 0 | 0 | 580 | 0 | 0 | 39 | 7 | 100 | 8.6 |
| METALS | Zinc | SO | 7 | mg/kg | 47.5 | 65.1 | 55.36 | 53.70 | 6.44 | 48.28 | 64.17 | 7 | 100 | 0 | 0 | 35000 | 0 | 0 | 2300 | 7 | 100 | 37 |
| OC_PEST | 4,4'-DDD | SO | 7 | mg/kg | <0.00095 | <0.0016 | n.d. | n.d. | n.d. | n.d. | n.d. | 0 | 0 | 0 | 0 | 9.6 | 0 | 0 | 2.3 | 0 | 0 | 0.0075 |
| OC_PEST | 4,4'-DDE | SO | 7 | mg/kg | <0.001 | <0.0018 | n.d. | n.d. | n.d. | n.d. | n.d. | 0 | 0 | 0 | 0 | 9.3 | 0 | 0 | 2 | 0 | 0 | 0.011 |
| OC_PEST | 4,4'-DDT | SO | 7 | mg/kg | <0.00075 | <0.0013 | n.d. | n.d. | n.d. | n.d. | n.d. | 0 | 0 | 0.00 | 0 | 8.5 | 0 | 0 | 1.9 | 0 | 0 | 0.077 |
| OC_PEST | Aldrin | SO | 7 | mg/kg | <0.00088 | <0.0015 | n.d. | n.d. | n.d. | n.d. | n.d. | 0 | 0 | 0.00 | 0 | 0.18 | 0 | 0 | 0.039 | 0 | 0 | 0.00015 |
| OC_PEST | alpha-BHC | SO | 7 | mg/kg | <0.00066 | <0.0011 | n.d. | n.d. | n.d. | n.d. | n.d. | 0 | 0 | 0 | 0 | 0.36 | 0 | 0 | 0.086 | 0 | 0 | 0.000042 |
| OC_PEST | alpha-Chlordane | SO | 7 | mg/kg | <0.0012 | <0.002 | n.d. | n.d. | n.d. | n.d. | n.d. | 0 | 0 | - | - | - | - | - | - | - | - | - |
| OC_PEST | beta-BHC | SO | 7 | mg/kg | <0.0007 | <0.0012 | n.d. | n.d. | n.d. | n.d. | n.d. | 0 | 0 | 0 | 0 | 1.3 | 0 | 0 | 0.3 | 0 | 0 | 0.00015 |
| OC_PEST | delta-BHC | SO | 7 | mg/kg | <0.00079 | <0.0013 | n.d. | n.d. | n.d. | n.d. | n.d. | 0 | 0 | - | - | - | - | - | - | - | - | - |
| OC_PEST | Dieldrin | SO | 7 | mg/kg | <0.00094 | <0.0016 | n.d. | n.d. | n.d. | n.d. | n.d. | 0 | 0 | 0 | 0 | 0.14 | 0 | 0 | 0.034 | 0 | 0 | 0.000071 |
| OC_PEST | Endosulfan I | SO | 7 | mg/kg | <0.001 | <0.0017 | n.d. | n.d. | n.d. | n.d. | n.d. | 0 | 0 | - | - | - | - | - | - | - | - | - |
| OC_PEST | Endosulfan II | SO | 7 | mg/kg | <0.0011 | <0.0019 | n.d. | n.d. | n.d. | n.d. | n.d. | 0 | 0 | - | - | - | - | - | - | - | - | - |

**Table 19. Borrow Pit Area Surface Soil Analytical Results Statistical Summary**
**Columbia Falls Aluminum Company, LLC, Phase I Site Characterization, 2000 Aluminum Drive, Columbia Falls, MT**

| | | | | | | | | | | | | | | Industrial RSL | | | Residential RSL | | | Risk SSL | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Group | Analyte | Matrix | No. of Results | Unit | Min | Max | Mean | Median | Standard Deviation | 5th Percentile | 95th Percentile | # > LOD | % > LOD | No. Exceeding | % Exceeding | Action Level | No. Exceeding | % Exceeding | Action Level | No. Exceeding | % Exceeding | Action Level |
| OC_PEST | Endosulfan sulfate | SO | 7 | mg/kg | <0.00084 | <0.0014 | n.d. | n.d. | n.d. | n.d. | n.d. | 0 | 0 | - | - | - | - | - | - | - | - | - |
| OC_PEST | Endrin | SO | 7 | mg/kg | <0.00092 | <0.0016 | n.d. | n.d. | n.d. | n.d. | n.d. | 0 | 0 | 0.00 | 0 | 25 | 0 | 0 | 1.9 | 0 | 0 | 0.0092 |
| OC_PEST | Endrin aldehyde | SO | 7 | mg/kg | <0.0009 | <0.0015 | n.d. | n.d. | n.d. | n.d. | n.d. | 0 | 0 | - | - | - | - | - | - | - | - | - |
| OC_PEST | Endrin ketone | SO | 7 | mg/kg | <0.001 | <0.0017 | n.d. | n.d. | n.d. | n.d. | n.d. | 0 | 0 | - | - | - | - | - | - | - | - | - |
| OC_PEST | gamma-BHC (Lindane) | SO | 7 | mg/kg | <0.00065 | <0.0011 | n.d. | n.d. | n.d. | n.d. | n.d. | 0 | 0 | 0 | 0 | 2.5 | 0 | 0 | 0.57 | 0 | 0 | 0.00024 |
| OC_PEST | gamma-Chlordane | SO | 7 | mg/kg | <0.0016 | <0.0027 | n.d. | n.d. | n.d. | n.d. | n.d. | 0 | 0 | - | - | - | - | - | - | - | - | - |
| OC_PEST | Heptachlor | SO | 7 | mg/kg | <0.00093 | <0.0016 | n.d. | n.d. | n.d. | n.d. | n.d. | 0 | 0 | 0 | 0 | 0.63 | 0 | 0 | 0.13 | 0 | 0 | 0.00012 |
| OC_PEST | Heptachlor epoxide | SO | 7 | mg/kg | <0.0014 | <0.0024 | n.d. | n.d. | n.d. | n.d. | n.d. | 0 | 0 | 0 | 0 | 0.33 | 0 | 0 | 0.07 | 0 | 0 | 0.000028 |
| OC_PEST | Methoxychlor | SO | 7 | mg/kg | <0.0015 | <0.0026 | n.d. | n.d. | n.d. | n.d. | n.d. | 0 | 0 | 0 | 0 | 410 | 0 | 0 | 32 | 0 | 0 | 0.2 |
| OC_PEST | Toxaphene | SO | 7 | mg/kg | <0.021 | <0.036 | n.d. | n.d. | n.d. | n.d. | n.d. | 0 | 0 | 0 | 0 | 2.1 | 0 | 0 | 0.49 | 0 | 0 | 0.011 |
| PCB | Aroclor 1016 | SO | 7 | mg/kg | <0.0096 | <0.016 | n.d. | n.d. | n.d. | n.d. | n.d. | 0 | 0 | 0 | 0 | 5.1 | 0 | 0 | 0.41 | 0 | 0 | 0.013 |
| PCB | Aroclor 1221 | SO | 7 | mg/kg | <0.0096 | <0.016 | n.d. | n.d. | n.d. | n.d. | n.d. | 0 | 0 | 0.00 | 0 | 0.83 | 0 | 0 | 0.2 | 0 | 0 | 0.00008 |
| PCB | Aroclor 1232 | SO | 7 | mg/kg | <0.0096 | <0.016 | n.d. | n.d. | n.d. | n.d. | n.d. | 0 | 0 | 0.00 | 0 | 0.72 | 0 | 0 | 0.17 | 0 | 0 | 0.00008 |
| PCB | Aroclor 1242 | SO | 7 | mg/kg | <0.0096 | <0.016 | n.d. | n.d. | n.d. | n.d. | n.d. | 0 | 0 | 0 | 0 | 0.95 | 0 | 0 | 0.23 | 0 | 0 | 0.0012 |
| PCB | Aroclor 1248 | SO | 7 | mg/kg | <0.0096 | <0.016 | n.d. | n.d. | n.d. | n.d. | n.d. | 0 | 0 | 0 | 0 | 0.95 | 0 | 0 | 0.23 | 0 | 0 | 0.0012 |
| PCB | Aroclor 1254 | SO | 7 | mg/kg | <0.0099 | <0.017 | n.d. | n.d. | n.d. | n.d. | n.d. | 0 | 0 | 0 | 0 | 0.97 | 0 | 0 | 0.12 | 0 | 0 | 0.002 |
| PCB | Aroclor 1260 | SO | 7 | mg/kg | <0.0099 | <0.017 | n.d. | n.d. | n.d. | n.d. | n.d. | 0 | 0 | 0 | 0 | 0.99 | 0 | 0 | 0.24 | 0 | 0 | 0.0055 |
| PCB | Aroclor 1268 | SO | 7 | mg/kg | <0.0099 | <0.017 | n.d. | n.d. | n.d. | n.d. | n.d. | 0 | 0 | - | - | - | - | - | - | - | - | - |
| PCB | Aroclor-1262 | SO | 7 | mg/kg | <0.0099 | <0.017 | n.d. | n.d. | n.d. | n.d. | n.d. | 0 | 0 | - | - | - | - | - | - | - | - | - |
| PCB | Polychlorinated biphenyls, Total | SO | 7 | mg/kg | <0.0099 | <0.017 | n.d. | n.d. | n.d. | n.d. | n.d. | 0 | 0 | 0 | 0 | 0.94 | 0 | 0 | 0.23 | 0 | 0 | 0.0068 |
| SVOC | 1,1'-Biphenyl | SO | 7 | mg/kg | <0.03 | <0.052 | n.d. | n.d. | n.d. | n.d. | n.d. | 0 | 0 | 0.00 | 0 | 20 | 0 | 0 | 4.7 | 0 | 0 | 0.00087 |
| SVOC | 1,2,4,5-Tetrachlorobenzene | SO | 7 | mg/kg | <0.027 | <0.045 | n.d. | n.d. | n.d. | n.d. | n.d. | 0 | 0 | 0 | 0 | 35 | 0 | 0 | 2.3 | 0 | 0 | 0.00079 |
| SVOC | 1,4-Dioxane | SO | 7 | mg/kg | <0.095 | <0.16 | n.d. | n.d. | n.d. | n.d. | n.d. | 0 | 0 | 0 | 0 | 24 | 0 | 0 | 5.3 | 0 | 0 | 0.000094 |
| SVOC | 2,2'-oxybis[1-chloropropane] | SO | 7 | mg/kg | <0.015 | <0.025 | n.d. | n.d. | n.d. | n.d. | n.d. | 0 | 0 | 0 | 0 | 4700 | 0 | 0 | 310 | 0 | 0 | 0.026 |
| SVOC | 2,3,4,6-Tetrachlorophenol | SO | 7 | mg/kg | <0.034 | <0.057 | n.d. | n.d. | n.d. | n.d. | n.d. | 0 | 0 | 0 | 0 | 2500 | 0 | 0 | 190 | 0 | 0 | 0.018 |
| SVOC | 2,4,5-Trichlorophenol | SO | 7 | mg/kg | <0.035 | <0.061 | n.d. | n.d. | n.d. | n.d. | n.d. | 0 | 0 | 0 | 0 | 8200 | 0 | 0 | 630 | 0 | 0 | 0.4 |
| SVOC | 2,4,6-Trichlorophenol | SO | 7 | mg/kg | <0.01 | <0.017 | n.d. | n.d. | n.d. | n.d. | n.d. | 0 | 0 | 0 | 0 | 82 | 0 | 0 | 6.3 | 0 | 0 | 0.0012 |
| SVOC | 2,4-Dichlorophenol | SO | 7 | mg/kg | <0.0084 | <0.014 | n.d. | n.d. | n.d. | n.d. | n.d. | 0 | 0 | 0.00 | 0 | 250 | 0 | 0 | 19 | 0 | 0 | 0.0023 |
| SVOC | 2,4-Dimethylphenol | SO | 7 | mg/kg | <0.078 | <0.13 | n.d. | n.d. | n.d. | n.d. | n.d. | 0 | 0 | 0 | 0 | 1600 | 0 | 0 | 130 | 0 | 0 | 0.042 |
| SVOC | 2,4-Dinitrophenol | SO | 7 | mg/kg | <0.27 | <0.46 | n.d. | n.d. | n.d. | n.d. | n.d. | 0 | 0 | 0 | 0 | 160 | 0 | 0 | 13 | 0 | 0 | 0.0044 |
| SVOC | 2,4-Dinitrotoluene | SO | 7 | mg/kg | <0.014 | <0.024 | n.d. | n.d. | n.d. | n.d. | n.d. | 0 | 0 | 0.00 | 0 | 7.4 | 0 | 0 | 1.7 | 0 | 0 | 0.00032 |
| SVOC | 2,6-Dinitrotoluene | SO | 7 | mg/kg | <0.019 | <0.032 | n.d. | n.d. | n.d. | n.d. | n.d. | 0 | 0 | 0 | 0 | 1.5 | 0 | 0 | 0.36 | 0 | 0 | 0.000067 |
| SVOC | 2-Chloronaphthalene | SO | 7 | mg/kg | <0.0081 | <0.014 | n.d. | n.d. | n.d. | n.d. | n.d. | 0 | 0 | 0 | 0 | 6000 | 0 | 0 | 480 | 0 | 0 | 0.39 |
| SVOC | 2-Chlorophenol | SO | 7 | mg/kg | <0.0091 | <0.016 | n.d. | n.d. | n.d. | n.d. | n.d. | 0 | 0 | 0.00 | 0 | 580 | 0 | 0 | 39 | 0 | 0 | 0.0089 |
| SVOC | 2-Methylnaphthalene | SO | 7 | mg/kg | <0.0079 | 0.014 | n.d. | n.d. | n.d. | n.d. | 0.01 | 1 | 14 | 0 | 0 | 300 | 0 | 0 | 24 | 0 | 0 | 0.019 |
| SVOC | 2-Methylphenol | SO | 7 | mg/kg | <0.016 | <0.027 | n.d. | n.d. | n.d. | n.d. | n.d. | 0 | 0 | 0 | 0 | 4100 | 0 | 0 | 320 | 0 | 0 | 0.075 |

**Table 19. Borrow Pit Area Surface Soil Analytical Results Statistical Summary**
**Columbia Falls Aluminum Company, LLC, Phase I Site Characterization, 2000 Aluminum Drive, Columbia Falls, MT**

| | | | | | | | | | | | | | | Industrial RSL | | | Residential RSL | | | Risk SSL | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Group | Analyte | Matrix | No. of Results | Unit | Min | Max | Mean | Median | Standard Deviation | 5th Percentile | 95th Percentile | # > LOD | % > LOD | No. Exceeding | % Exceeding | Action Level | No. Exceeding | % Exceeding | Action Level | No. Exceeding | % Exceeding | Action Level |
| SVOC | 2-Nitroaniline | SO | 7 | mg/kg | <0.012 | <0.02 | n.d. | n.d. | n.d. | n.d. | n.d. | 0 | 0 | 0 | 0 | 800 | 0 | 0 | 63 | 0 | 0 | 0.008 |
| SVOC | 2-Nitrophenol | SO | 7 | mg/kg | <0.012 | <0.02 | n.d. | n.d. | n.d. | n.d. | n.d. | 0 | 0 | - | - | - | - | - | - | - | - | - |
| SVOC | 3 & 4 Methylphenol | SO | 7 | mg/kg | <0.0095 | 0.068 | 0.01 | n.d. | 0.03 | n.d. | 0.07 | 2 | 29 | - | - | - | - | - | - | - | - | - |
| SVOC | 3,3'-Dichlorobenzidine | SO | 6 | mg/kg | <0.04 | <0.068 | n.d. | n.d. | n.d. | n.d. | n.d. | 0 | 0 | 0 | 0 | 5.1 | 0 | 0 | 1.2 | 0 | 0 | 0.00082 |
| SVOC | 3-Nitroaniline | SO | 7 | mg/kg | <0.011 | <0.018 | n.d. | n.d. | n.d. | n.d. | n.d. | 0 | 0 | - | - | - | - | - | - | - | - | - |
| SVOC | 4,6-Dinitro-2-methylphenol | SO | 7 | mg/kg | <0.095 | <0.16 | n.d. | n.d. | n.d. | n.d. | n.d. | 0 | 0 | 0 | 0 | 6.6 | 0 | 0 | 0.51 | 0 | 0 | 0.00026 |
| SVOC | 4-Bromophenyl phenyl ether | SO | 7 | mg/kg | <0.011 | <0.019 | n.d. | n.d. | n.d. | n.d. | n.d. | 0 | 0 | - | - | - | - | - | - | - | - | - |
| SVOC | 4-Chloro-3-methylphenol | SO | 7 | mg/kg | <0.015 | <0.026 | n.d. | n.d. | n.d. | n.d. | n.d. | 0 | 0 | 0 | 0 | 8200 | 0 | 0 | 630 | 0 | 0 | 0.17 |
| SVOC | 4-Chloroaniline | SO | 7 | mg/kg | <0.0092 | <0.016 | n.d. | n.d. | n.d. | n.d. | n.d. | 0 | 0 | 0.00 | 0 | 11 | 0 | 0 | 2.7 | 0 | 0 | 0.00016 |
| SVOC | 4-Chlorophenyl phenyl ether | SO | 7 | mg/kg | <0.011 | <0.018 | n.d. | n.d. | n.d. | n.d. | n.d. | 0 | 0 | - | - | - | - | - | - | - | - | - |
| SVOC | 4-Nitroaniline | SO | 7 | mg/kg | <0.013 | <0.023 | n.d. | n.d. | n.d. | n.d. | n.d. | 0 | 0 | 0 | 0 | 110 | 0 | 0 | 25 | 0 | 0 | 0.0016 |
| SVOC | 4-Nitrophenol | SO | 7 | mg/kg | <0.17 | <0.29 | n.d. | n.d. | n.d. | n.d. | n.d. | 0 | 0 | - | - | - | - | - | - | - | - | - |
| SVOC | Acenaphthene | SO | 7 | mg/kg | <0.0086 | 0.042 | 0.01 | n.d. | 0.02 | n.d. | 0.04 | 3 | 43 | 0.00 | 0 | 4500 | 0 | 0 | 360 | 0 | 0 | 0.55 |
| SVOC | Acenaphthylene | SO | 7 | mg/kg | <0.0092 | <0.016 | n.d. | n.d. | n.d. | n.d. | n.d. | 0 | 0 | - | - | - | - | - | - | - | - | - |
| SVOC | Acetophenone | SO | 7 | mg/kg | <0.0078 | 0.024 | 0.01 | n.d. | 0.01 | n.d. | 0.02 | 2 | 29 | 0 | 0 | 12000 | 0 | 0 | 780 | 0 | 0 | 0.058 |
| SVOC | Anthracene | SO | 7 | mg/kg | <0.034 | 0.089 | n.d. | n.d. | n.d. | n.d. | 0.09 | 1 | 14 | 0 | 0 | 23000 | 0 | 0 | 1800 | 0 | 0 | 5.8 |
| SVOC | Atrazine | SO | 7 | mg/kg | <0.016 | <0.027 | n.d. | n.d. | n.d. | n.d. | n.d. | 0 | 0 | 0.00 | 0 | 10 | 0 | 0 | 2.4 | 0 | 0 | 0.0002 |
| SVOC | Benzaldehyde | SO | 7 | mg/kg | <0.027 | 0.06 | n.d. | n.d. | n.d. | n.d. | 0.06 | 1 | 14 | 0 | 0 | 820 | 0 | 0 | 170 | 1 | 14 | 0.0041 |
| SVOC | Benzo[a]anthracene | SO | 7 | mg/kg | <0.03 | 0.55 | 0.15 | 0.07 | 0.20 | n.d. | 0.49 | 5 | 71 | 0 | 0 | 2.9 | 2 | 29 | 0.16 | 5 | 71 | 0.0042 |
| SVOC | Benzo[a]pyrene | SO | 7 | mg/kg | 0.027 | 0.85 | 0.28 | 0.08 | 0.32 | 0.03 | 0.76 | 7 | 100 | 3 | 43 | 0.29 | 7 | 100 | 0.016 | 7 | 100 | 0.004 |
| SVOC | Benzo[b]fluoranthene | SO | 7 | mg/kg | 0.075 | 2.7 | 0.80 | 0.25 | 0.99 | 0.08 | 2.34 | 7 | 100 | 0 | 0 | 2.9 | 4 | 57 | 0.16 | 7 | 100 | 0.041 |
| SVOC | Benzo[g,h,i]perylene | SO | 7 | mg/kg | 0.033 | 1.3 | 0.41 | 0.12 | 0.49 | 0.03 | 1.15 | 7 | 100 | - | - | - | - | - | - | - | - | - |
| SVOC | Benzo[k]fluoranthene | SO | 7 | mg/kg | 0.028 | 0.74 | 0.25 | 0.08 | 0.28 | 0.03 | 0.67 | 7 | 100 | 0 | 0 | 29 | 0 | 0 | 1.6 | 2 | 29 | 0.4 |
| SVOC | Bis(2-chloroethoxy)methane | SO | 7 | mg/kg | <0.011 | <0.019 | n.d. | n.d. | n.d. | n.d. | n.d. | 0 | 0 | 0 | 0 | 250 | 0 | 0 | 19 | 0 | 0 | 0.0013 |
| SVOC | Bis(2-chloroethyl)ether | SO | 7 | mg/kg | <0.0084 | <0.014 | n.d. | n.d. | n.d. | n.d. | n.d. | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0.23 | 0 | 0 | 0.0000036 |
| SVOC | Bis(2-ethylhexyl) phthalate | SO | 7 | mg/kg | <0.014 | 0.016 | n.d. | n.d. | n.d. | n.d. | 0.02 | 1 | 14 | 0 | 0 | 160 | 0 | 0 | 39 | 0 | 0 | 1.3 |
| SVOC | Butyl benzyl phthalate | SO | 7 | mg/kg | <0.011 | <0.019 | n.d. | n.d. | n.d. | n.d. | n.d. | 0 | 0 | 0 | 0 | 1200 | 0 | 0 | 290 | 0 | 0 | 0.24 |
| SVOC | Caprolactam | SO | 7 | mg/kg | <0.026 | <0.044 | n.d. | n.d. | n.d. | n.d. | n.d. | 0 | 0 | 0 | 0 | 40000 | 0 | 0 | 3100 | 0 | 0 | 0.25 |
| SVOC | Carbazole | SO | 7 | mg/kg | <0.0088 | 0.13 | 0.04 | 0.01 | 0.05 | n.d. | 0.12 | 4 | 57 | - | - | - | - | - | - | - | - | - |
| SVOC | Chrysene | SO | 7 | mg/kg | 0.045 | 1.5 | 0.40 | 0.16 | 0.52 | 0.05 | 1.21 | 7 | 100 | 0 | 0 | 290 | 0 | 0 | 16 | 1 | 14 | 1.2 |
| SVOC | Dibenz(a,h)anthracene | SO | 7 | mg/kg | <0.019 | 0.27 | 0.08 | n.d. | 0.11 | n.d. | 0.26 | 3 | 43 | 0 | 0 | 0.29 | 3 | 43 | 0.016 | 3 | 43 | 0.013 |
| SVOC | Dibenzofuran | SO | 7 | mg/kg | <0.011 | 0.023 | n.d. | n.d. | n.d. | n.d. | 0.02 | 1 | 14 | 0 | 0 | 100 | 0 | 0 | 7.3 | 1 | 14 | 0.015 |
| SVOC | Diethyl phthalate | SO | 7 | mg/kg | <0.01 | <0.017 | n.d. | n.d. | n.d. | n.d. | n.d. | 0 | 0 | 0 | 0 | 66000 | 0 | 0 | 5100 | 0 | 0 | 0.61 |
| SVOC | Dimethyl phthalate | SO | 7 | mg/kg | <0.01 | <0.018 | n.d. | n.d. | n.d. | n.d. | n.d. | 0 | 0 | - | - | - | - | - | - | - | - | - |
| SVOC | Di-n-butyl phthalate | SO | 7 | mg/kg | <0.011 | 0.22 | n.d. | n.d. | n.d. | n.d. | 0.22 | 1 | 14 | 0 | 0 | 8200 | 0 | 0 | 630 | 0 | 0 | 0.23 |
| SVOC | Di-n-octyl phthalate | SO | 7 | mg/kg | <0.018 | <0.031 | n.d. | n.d. | n.d. | n.d. | n.d. | 0 | 0 | 0 | 0 | 820 | 0 | 0 | 63 | 0 | 0 | 5.7 |

**Table 19. Borrow Pit Area Surface Soil Analytical Results Statistical Summary**
**Columbia Falls Aluminum Company, LLC, Phase I Site Characterization, 2000 Aluminum Drive, Columbia Falls, MT**

| Group | Analyte | Matrix | No. of Results | Unit | Min | Max | Mean | Median | Standard Deviation | 5th Percentile | 95th Percentile | # > LOD | % > LOD | Industrial RSL | | | Residential RSL | | | Risk SSL | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | | | | | | | No. Exceeding | % Exceeding | Action Level | No. Exceeding | % Exceeding | Action Level | No. Exceeding | % Exceeding | Action Level |
| SVOC | Fluoranthene | SO | 7 | mg/kg | 0.026 | 1 | 0.36 | 0.11 | 0.40 | 0.03 | 0.94 | 7 | 100 | 0 | 0 | 3000 | 0 | 0 | 240 | 0 | 0 | 8.9 |
| SVOC | Fluorene | SO | 7 | mg/kg | <0.0078 | 0.038 | 0.01 | n.d. | 0.01 | n.d. | 0.04 | 3 | 43 | 0 | 0 | 3000 | 0 | 0 | 240 | 0 | 0 | 0.54 |
| SVOC | Hexachlorobenzene | SO | 7 | mg/kg | <0.014 | <0.025 | n.d. | n.d. | n.d. | n.d. | n.d. | 0 | 0 | 0 | 0 | 0.96 | 0 | 0 | 0.21 | 0 | 0 | 0.00012 |
| SVOC | Hexachlorobutadiene | SO | 7 | mg/kg | <0.01 | <0.017 | n.d. | n.d. | n.d. | n.d. | n.d. | 0 | 0 | 0 | 0 | 5.3 | 0 | 0 | 1.2 | 0 | 0 | 0.00027 |
| SVOC | Hexachlorocyclopentadiene | SO | 7 | mg/kg | <0.022 | <0.038 | n.d. | n.d. | n.d. | n.d. | n.d. | 0 | 0 | 0 | 0 | 0.75 | 0 | 0 | 0.18 | 0 | 0 | 0.00013 |
| SVOC | Hexachloroethane | SO | 7 | mg/kg | <0.013 | <0.022 | n.d. | n.d. | n.d. | n.d. | n.d. | 0 | 0 | 0 | 0 | 8 | 0 | 0 | 1.8 | 0 | 0 | 0.0002 |
| SVOC | Indeno[1,2,3-cd]pyrene | SO | 7 | mg/kg | 0.032 | 1.4 | 0.44 | 0.12 | 0.53 | 0.03 | 1.24 | 7 | 100 | 0 | 0 | 2.9 | 3 | 43 | 0.16 | 3 | 43 | 0.13 |
| SVOC | Isophorone | SO | 7 | mg/kg | <0.0077 | <0.013 | n.d. | n.d. | n.d. | n.d. | n.d. | 0 | 0 | 0 | 0 | 2400 | 0 | 0 | 570 | 0 | 0 | 0.026 |
| SVOC | Naphthalene | SO | 7 | mg/kg | <0.0091 | 0.025 | n.d. | n.d. | n.d. | n.d. | 0.03 | 1 | 14 | 0 | 0 | 17 | 0 | 0 | 3.8 | 1 | 14 | 0.00054 |
| SVOC | Nitrobenzene | SO | 7 | mg/kg | <0.011 | <0.019 | n.d. | n.d. | n.d. | n.d. | n.d. | 0 | 0 | 0.00 | 0 | 22 | 0 | 0 | 5.1 | 0 | 0 | 0.000092 |
| SVOC | N-Nitrosodi-n-propylamine | SO | 7 | mg/kg | <0.012 | <0.02 | n.d. | n.d. | n.d. | n.d. | n.d. | 0 | 0 | 0 | 0 | 0.33 | 0 | 0 | 0.078 | 0 | 0 | 0.0000081 |
| SVOC | N-Nitrosodiphenylamine | SO | 7 | mg/kg | <0.032 | <0.055 | n.d. | n.d. | n.d. | n.d. | n.d. | 0 | 0 | 0 | 0 | 470 | 0 | 0 | 110 | 0 | 0 | 0.067 |
| SVOC | Pentachlorophenol | SO | 7 | mg/kg | <0.043 | <0.074 | n.d. | n.d. | n.d. | n.d. | n.d. | 0 | 0 | 0 | 0 | 4 | 0 | 0 | 1 | 0 | 0 | 0.000057 |
| SVOC | Phenanthrene | SO | 7 | mg/kg | 0.017 | 0.49 | 0.16 | 0.05 | 0.18 | 0.02 | 0.43 | 7 | 100 | - | - | - | - | - | - | - | - | - |
| SVOC | Phenol | SO | 7 | mg/kg | <0.012 | <0.02 | n.d. | n.d. | n.d. | n.d. | n.d. | 0 | 0 | 0 | 0 | 25000 | 0 | 0 | 1900 | 0 | 0 | 0.33 |
| SVOC | Pyrene | SO | 7 | mg/kg | 0.028 | 1 | 0.28 | 0.11 | 0.35 | 0.03 | 0.82 | 7 | 100 | 0 | 0 | 2300 | 0 | 0 | 180 | 0 | 0 | 1.3 |

mg/kg - Milligrams per Kilograms
n.d - Non Detect
LOD - Limit of Detection
Industiral RSL - Environmental Protection Agency Industrial Soil Regional Screening Level
Residential RSL - Environmental Protection Agency Residnetial Soil Regional Screening Level
Risk SSL - Environmental Protection Agency Human Health Protection of Ground Water - Risk-based Soil Screening Level

**Table 20. Borrow Pit Area Intermediate Soil Analytical Results Statistical Summary**
**Columbia Falls Aluminum Company, LLC, Phase I Site Characterization, 2000 Aluminum Drive, Columbia Falls, MT**

| Group | Analyte | Matrix | No. of Results | Unit | Min | Max | Mean | Median | Standard Deviation | 5th Percentile | 95th Percentile | # > LOD | % > LOD | Industrial RSL No. Exceeding | Industrial RSL % Exceeding | Industrial RSL Action Level | Residential RSL No. Exceeding | Residential RSL % Exceeding | Residential RSL Action Level | Risk SSL No. Exceeding | Risk SSL % Exceeding | Risk SSL Action Level |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| GENCHEM | Fluoride | SO | 14 | mg/kg | 0.87 | 40.9 | 9.32 | 4.14 | 12.19 | 1.36 | 35.05 | 14 | 100 | 0 | 0 | 4700 | 0 | 0 | 310 | 3 | 21 | 12 |
| METALS | Aluminum | SO | 14 | mg/kg | 2080 | 16800 | 9741.43 | 8995.00 | 3834.88 | 4322.50 | 15175.00 | 14 | 100 | 0 | 0 | 110000 | 11 | 79 | 7700 | 13 | 93 | 3000 |
| METALS | Antimony | SO | 14 | mg/kg | <0.27 | <0.29 | n.d. | n.d. | n.d. | n.d. | n.d. | 0 | 0 | 0 | 0 | 47 | 0 | 0 | 3.1 | 0 | 0 | 0.035 |
| METALS | Arsenic | SO | 14 | mg/kg | 0.8 | 8.6 | 4.74 | 4.55 | 2.03 | 1.84 | 8.08 | 14 | 100 | 12 | 86 | 3 | 14 | 100 | 0.68 | 14 | 100 | 0.0015 |
| METALS | Barium | SO | 14 | mg/kg | 18.2 | 166 | 75.35 | 74.60 | 37.69 | 26.78 | 127.65 | 14 | 100 | 0 | 0 | 22000 | 0 | 0 | 1500 | 14 | 100 | 16 |
| METALS | Beryllium | SO | 14 | mg/kg | 0.094 | 0.59 | 0.35 | 0.34 | 0.14 | 0.19 | 0.58 | 14 | 100 | 0 | 0 | 230 | 0 | 0 | 16 | 0 | 0 | 1.9 |
| METALS | Cadmium | SO | 14 | mg/kg | <0.28 | <0.31 | n.d. | n.d. | n.d. | n.d. | n.d. | 0 | 0 | 0 | 0 | 98 | 0 | 0 | 7.1 | 0 | 0 | 0.069 |
| METALS | Calcium | SO | 14 | mg/kg | 421 | 47100 | 18589.14 | 15470.00 | 18490.72 | 593.90 | 43525.00 | 14 | 100 | - | - | - | - | - | - | - | - | - |
| METALS | Chromium | SO | 14 | mg/kg | 1.5 | 12.1 | 8.02 | 8.40 | 2.65 | 4.23 | 11.32 | 14 | 100 | - | - | - | - | - | - | - | - | - |
| METALS | Cobalt | SO | 14 | mg/kg | 0.63 | 7.8 | 4.62 | 4.65 | 1.87 | 1.78 | 7.74 | 14 | 100 | 0.00 | 0 | 35 | 13 | 93 | 2.3 | 14 | 100 | 0.027 |
| METALS | Copper | SO | 14 | mg/kg | 5.8 | 25.8 | 14.30 | 13.85 | 5.79 | 7.04 | 24.11 | 14 | 100 | 0 | 0 | 4700 | 0 | 0 | 310 | 14 | 100 | 2.8 |
| METALS | Cyanide, Total | SO | 14 | mg/kg | <0.026 | 0.28 | 0.06 | 0.03 | 0.08 | n.d. | 0.25 | 9 | 64 | 0 | 0 | 15 | 0 | 0 | 2.3 | 9 | 64 | 0.0015 |
| METALS | Iron | SO | 14 | mg/kg | 2670 | 20400 | 12532.14 | 12000.00 | 4521.41 | 6791.00 | 19360.00 | 14 | 100 | 0 | 0 | 82000 | 13 | 93 | 5500 | 14 | 100 | 35 |
| METALS | Lead | SO | 14 | mg/kg | 3.3 | 14.9 | 8.01 | 7.25 | 3.19 | 4.02 | 13.73 | 14 | 100 | 0 | 0 | 800 | 0 | 0 | 400 | - | - | - |
| METALS | Magnesium | SO | 14 | mg/kg | 977 | 14200 | 9531.21 | 9660.00 | 3500.62 | 4209.45 | 14005.00 | 14 | 100 | - | - | - | - | - | - | - | - | - |
| METALS | Manganese | SO | 14 | mg/kg | 48 | 975 | 338.14 | 269.00 | 224.34 | 106.50 | 718.25 | 14 | 100 | 0 | 0 | 2600 | 12 | 86 | 180 | 14 | 100 | 2.8 |
| METALS | Mercury | SO | 14 | mg/kg | 0.014 | 0.044 | 0.03 | 0.03 | 0.01 | 0.01 | 0.04 | 14 | 100 | 0 | 0 | 4.6 | 0 | 0 | 1.1 | 14 | 100 | 0.0033 |
| METALS | Nickel | SO | 14 | mg/kg | 1.6 | 15.6 | 9.58 | 9.65 | 3.37 | 4.46 | 13.85 | 14 | 100 | 0 | 0 | 2200 | 0 | 0 | 150 | 13 | 93 | 2.6 |
| METALS | Potassium | SO | 14 | mg/kg | 184 | 1040 | 596.79 | 588.00 | 198.80 | 336.10 | 884.65 | 14 | 100 | - | - | - | - | - | - | - | - | - |
| METALS | Selenium | SO | 14 | mg/kg | <0.25 | <0.27 | n.d. | n.d. | n.d. | n.d. | n.d. | 0 | 0 | 0 | 0 | 580 | 0 | 0 | 39 | 0 | 0 | 0.052 |
| METALS | Silver | SO | 14 | mg/kg | <0.52 | <0.57 | n.d. | n.d. | n.d. | n.d. | n.d. | 0 | 0 | 0 | 0 | 580 | 0 | 0 | 39 | 0 | 0 | 0.08 |
| METALS | Sodium | SO | 14 | mg/kg | <36.1 | 63.3 | n.d. | n.d. | n.d. | n.d. | 62.47 | 2 | 14 | - | - | - | - | - | - | - | - | - |
| METALS | Thallium | SO | 14 | mg/kg | <0.11 | <0.12 | n.d. | n.d. | n.d. | n.d. | n.d. | 0 | 0 | 0.00 | 0 | 1.2 | 0 | 0 | 0.078 | 0 | 0 | 0.0014 |
| METALS | Vanadium | SO | 14 | mg/kg | 1.9 | 12.7 | 7.70 | 6.80 | 3.29 | 3.66 | 12.64 | 14 | 100 | 0 | 0 | 580 | 0 | 0 | 39 | 5 | 36 | 8.6 |
| METALS | Zinc | SO | 14 | mg/kg | 7.8 | 48.5 | 34.47 | 36.55 | 10.87 | 17.81 | 47.92 | 14 | 100 | 0 | 0 | 35000 | 0 | 0 | 2300 | 6 | 43 | 37 |
| PCB | Aroclor 1016 | SO | 14 | mg/kg | <0.0093 | <0.01 | n.d. | n.d. | n.d. | n.d. | n.d. | 0 | 0 | 0 | 0 | 5.1 | 0 | 0 | 0.41 | 0 | 0 | 0.013 |
| PCB | Aroclor 1221 | SO | 14 | mg/kg | <0.0093 | <0.01 | n.d. | n.d. | n.d. | n.d. | n.d. | 0 | 0 | 0.00 | 0 | 0.83 | 0 | 0 | 0.2 | 0 | 0 | 0.00008 |
| PCB | Aroclor 1232 | SO | 14 | mg/kg | <0.0093 | <0.01 | n.d. | n.d. | n.d. | n.d. | n.d. | 0 | 0 | 0 | 0 | 0.72 | 0 | 0 | 0.17 | 0 | 0 | 0.00008 |
| PCB | Aroclor 1242 | SO | 14 | mg/kg | <0.0093 | <0.01 | n.d. | n.d. | n.d. | n.d. | n.d. | 0 | 0 | 0.00 | 0 | 0.95 | 0 | 0 | 0.23 | 0 | 0 | 0.0012 |
| PCB | Aroclor 1248 | SO | 14 | mg/kg | <0.0093 | <0.01 | n.d. | n.d. | n.d. | n.d. | n.d. | 0 | 0 | 0 | 0 | 0.95 | 0 | 0 | 0.23 | 0 | 0 | 0.0012 |
| PCB | Aroclor 1254 | SO | 14 | mg/kg | <0.0097 | <0.011 | n.d. | n.d. | n.d. | n.d. | n.d. | 0 | 0 | 0 | 0 | 0.97 | 0 | 0 | 0.12 | 0 | 0 | 0.002 |
| PCB | Aroclor 1260 | SO | 14 | mg/kg | <0.0097 | <0.011 | n.d. | n.d. | n.d. | n.d. | n.d. | 0 | 0 | 0.00 | 0 | 0.99 | 0 | 0 | 0.24 | 0 | 0 | 0.0055 |
| PCB | Aroclor 1268 | SO | 14 | mg/kg | <0.0097 | <0.011 | n.d. | n.d. | n.d. | n.d. | n.d. | 0 | 0 | - | - | - | - | - | - | - | - | - |
| PCB | Aroclor-1262 | SO | 14 | mg/kg | <0.0097 | <0.011 | n.d. | n.d. | n.d. | n.d. | n.d. | 0 | 0 | - | - | - | - | - | - | - | - | - |
| PCB | Polychlorinated biphenyls, Total | SO | 14 | mg/kg | <0.0097 | <0.011 | n.d. | n.d. | n.d. | n.d. | n.d. | 0 | 0 | 0 | 0 | 0.94 | 0 | 0 | 0.23 | 0 | 0 | 0.0068 |
| SVOC | 1,1'-Biphenyl | SO | 14 | mg/kg | <0.03 | <0.033 | n.d. | n.d. | n.d. | n.d. | n.d. | 0 | 0 | 0.00 | 0 | 20 | 0 | 0 | 4.7 | 0 | 0 | 0.00087 |
| SVOC | 1,2,4,5-Tetrachlorobenzene | SO | 14 | mg/kg | <0.026 | <0.029 | n.d. | n.d. | n.d. | n.d. | n.d. | 0 | 0 | 0 | 0 | 35 | 0 | 0 | 2.3 | 0 | 0 | 0.00079 |

**Table 20. Borrow Pit Area Intermediate Soil Analytical Results Statistical Summary**
**Columbia Falls Aluminum Company, LLC, Phase I Site Characterization, 2000 Aluminum Drive, Columbia Falls, MT**

| | | | | | | | | | | | | | | Industrial RSL | | | Residential RSL | | | Risk SSL | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Group | Analyte | Matrix | No. of Results | Unit | Min | Max | Mean | Median | Standard Deviation | 5th Percentile | 95th Percentile | # > LOD | % > LOD | No. Exceeding | % Exceeding | Action Level | No. Exceeding | % Exceeding | Action Level | No. Exceeding | % Exceeding | Action Level |
| SVOC | 1,4-Dioxane | SO | 14 | mg/kg | <0.093 | <0.1 | n.d. | n.d. | n.d. | n.d. | n.d. | 0 | 0 | 0 | 0 | 24 | 0 | 0 | 5.3 | 0 | 0 | 0.000094 |
| SVOC | 2,2'-oxybis[1-chloropropane] | SO | 14 | mg/kg | <0.014 | <0.016 | n.d. | n.d. | n.d. | n.d. | n.d. | 0 | 0 | 0 | 0 | 4700 | 0 | 0 | 310 | 0 | 0 | 0.026 |
| SVOC | 2,3,4,6-Tetrachlorophenol | SO | 14 | mg/kg | <0.033 | <0.037 | n.d. | n.d. | n.d. | n.d. | n.d. | 0 | 0 | 0 | 0 | 2500 | 0 | 0 | 190 | 0 | 0 | 0.018 |
| SVOC | 2,4,5-Trichlorophenol | SO | 14 | mg/kg | <0.034 | <0.039 | n.d. | n.d. | n.d. | n.d. | n.d. | 0 | 0 | 0 | 0 | 8200 | 0 | 0 | 630 | 0 | 0 | 0.4 |
| SVOC | 2,4,6-Trichlorophenol | SO | 14 | mg/kg | <0.0099 | <0.011 | n.d. | n.d. | n.d. | n.d. | n.d. | 0 | 0 | 0 | 0 | 82 | 0 | 0 | 6.3 | 0 | 0 | 0.0012 |
| SVOC | 2,4-Dichlorophenol | SO | 14 | mg/kg | <0.0082 | <0.0092 | n.d. | n.d. | n.d. | n.d. | n.d. | 0 | 0 | 0 | 0 | 250 | 0 | 0 | 19 | 0 | 0 | 0.0023 |
| SVOC | 2,4-Dimethylphenol | SO | 14 | mg/kg | <0.076 | <0.086 | n.d. | n.d. | n.d. | n.d. | n.d. | 0 | 0 | 0 | 0 | 1600 | 0 | 0 | 130 | 0 | 0 | 0.042 |
| SVOC | 2,4-Dinitrophenol | SO | 14 | mg/kg | <0.26 | <0.29 | n.d. | n.d. | n.d. | n.d. | n.d. | 0 | 0 | 0 | 0 | 160 | 0 | 0 | 13 | 0 | 0 | 0.0044 |
| SVOC | 2,4-Dinitrotoluene | SO | 14 | mg/kg | <0.014 | <0.015 | n.d. | n.d. | n.d. | n.d. | n.d. | 0 | 0 | 0 | 0 | 7.4 | 0 | 0 | 1.7 | 0 | 0 | 0.00032 |
| SVOC | 2,6-Dinitrotoluene | SO | 14 | mg/kg | <0.018 | <0.021 | n.d. | n.d. | n.d. | n.d. | n.d. | 0 | 0 | 0 | 0 | 1.5 | 0 | 0 | 0.36 | 0 | 0 | 0.000067 |
| SVOC | 2-Chloronaphthalene | SO | 14 | mg/kg | <0.0079 | <0.0088 | n.d. | n.d. | n.d. | n.d. | n.d. | 0 | 0 | 0 | 0 | 6000 | 0 | 0 | 480 | 0 | 0 | 0.39 |
| SVOC | 2-Chlorophenol | SO | 14 | mg/kg | <0.0088 | <0.0099 | n.d. | n.d. | n.d. | n.d. | n.d. | 0 | 0 | 0 | 0 | 580 | 0 | 0 | 39 | 0 | 0 | 0.0089 |
| SVOC | 2-Methylnaphthalene | SO | 14 | mg/kg | <0.0077 | <0.0086 | n.d. | n.d. | n.d. | n.d. | n.d. | 0 | 0 | 0 | 0 | 300 | 0 | 0 | 24 | 0 | 0 | 0.019 |
| SVOC | 2-Methylphenol | SO | 14 | mg/kg | <0.015 | <0.017 | n.d. | n.d. | n.d. | n.d. | n.d. | 0 | 0 | 0 | 0 | 4100 | 0 | 0 | 320 | 0 | 0 | 0.075 |
| SVOC | 2-Nitroaniline | SO | 14 | mg/kg | <0.011 | <0.013 | n.d. | n.d. | n.d. | n.d. | n.d. | 0 | 0 | 0 | 0 | 800 | 0 | 0 | 63 | 0 | 0 | 0.008 |
| SVOC | 2-Nitrophenol | SO | 14 | mg/kg | <0.012 | <0.013 | n.d. | n.d. | n.d. | n.d. | n.d. | 0 | 0 | - | - | - | - | - | - | - | - | - |
| SVOC | 3 & 4 Methylphenol | SO | 14 | mg/kg | <0.0092 | <0.01 | n.d. | n.d. | n.d. | n.d. | n.d. | 0 | 0 | - | - | - | - | - | - | - | - | - |
| SVOC | 3,3'-Dichlorobenzidine | SO | 14 | mg/kg | <0.039 | <0.043 | n.d. | n.d. | n.d. | n.d. | n.d. | 0 | 0 | 0 | 0 | 5.1 | 0 | 0 | 1.2 | 0 | 0 | 0.00082 |
| SVOC | 3-Nitroaniline | SO | 14 | mg/kg | <0.01 | <0.012 | n.d. | n.d. | n.d. | n.d. | n.d. | 0 | 0 | - | - | - | - | - | - | - | - | - |
| SVOC | 4,6-Dinitro-2-methylphenol | SO | 14 | mg/kg | <0.092 | <0.1 | n.d. | n.d. | n.d. | n.d. | n.d. | 0 | 0 | 0 | 0 | 6.6 | 0 | 0 | 0.51 | 0 | 0 | 0.00026 |
| SVOC | 4-Bromophenyl phenyl ether | SO | 14 | mg/kg | <0.011 | <0.012 | n.d. | n.d. | n.d. | n.d. | n.d. | 0 | 0 | - | - | - | - | - | - | - | - | - |
| SVOC | 4-Chloro-3-methylphenol | SO | 14 | mg/kg | <0.015 | <0.017 | n.d. | n.d. | n.d. | n.d. | n.d. | 0 | 0 | 0 | 0 | 8200 | 0 | 0 | 630 | 0 | 0 | 0.17 |
| SVOC | 4-Chloroaniline | SO | 14 | mg/kg | <0.0089 | <0.01 | n.d. | n.d. | n.d. | n.d. | n.d. | 0 | 0 | 0 | 0 | 11 | 0 | 0 | 2.7 | 0 | 0 | 0.00016 |
| SVOC | 4-Chlorophenyl phenyl ether | SO | 14 | mg/kg | <0.01 | <0.012 | n.d. | n.d. | n.d. | n.d. | n.d. | 0 | 0 | - | - | - | - | - | - | - | - | - |
| SVOC | 4-Nitroaniline | SO | 14 | mg/kg | <0.013 | <0.015 | n.d. | n.d. | n.d. | n.d. | n.d. | 0 | 0 | 0 | 0 | 110 | 0 | 0 | 25 | 0 | 0 | 0.0016 |
| SVOC | 4-Nitrophenol | SO | 14 | mg/kg | <0.17 | <0.19 | n.d. | n.d. | n.d. | n.d. | n.d. | 0 | 0 | - | - | - | - | - | - | - | - | - |
| SVOC | Acenaphthene | SO | 14 | mg/kg | <0.0084 | <0.0094 | n.d. | n.d. | n.d. | n.d. | n.d. | 0 | 0 | 0 | 0 | 4500 | 0 | 0 | 360 | 0 | 0 | 0.55 |
| SVOC | Acenaphthylene | SO | 14 | mg/kg | <0.0089 | <0.01 | n.d. | n.d. | n.d. | n.d. | n.d. | 0 | 0 | - | - | - | - | - | - | - | - | - |
| SVOC | Acetophenone | SO | 14 | mg/kg | <0.0075 | <0.0085 | n.d. | n.d. | n.d. | n.d. | n.d. | 0 | 0 | 0 | 0 | 12000 | 0 | 0 | 780 | 0 | 0 | 0.058 |
| SVOC | Anthracene | SO | 14 | mg/kg | <0.033 | <0.037 | n.d. | n.d. | n.d. | n.d. | n.d. | 0 | 0 | 0 | 0 | 23000 | 0 | 0 | 1800 | 0 | 0 | 5.8 |
| SVOC | Atrazine | SO | 14 | mg/kg | <0.015 | <0.017 | n.d. | n.d. | n.d. | n.d. | n.d. | 0 | 0 | 0 | 0 | 10 | 0 | 0 | 2.4 | 0 | 0 | 0.0002 |
| SVOC | Benzaldehyde | SO | 14 | mg/kg | <0.026 | <0.03 | n.d. | n.d. | n.d. | n.d. | n.d. | 0 | 0 | 0.00 | 0 | 820 | 0 | 0 | 170 | 0 | 0 | 0.0041 |
| SVOC | Benzo[a]anthracene | SO | 14 | mg/kg | <0.029 | <0.032 | n.d. | n.d. | n.d. | n.d. | n.d. | 0 | 0 | 0 | 0 | 2.9 | 0 | 0 | 0.16 | 0 | 0 | 0.0042 |
| SVOC | Benzo[a]pyrene | SO | 14 | mg/kg | <0.01 | 0.011 | n.d. | n.d. | n.d. | n.d. | - | 1 | 7 | 0 | 0 | 0.29 | 0 | 0 | 0.016 | 1 | 7 | 0.004 |
| SVOC | Benzo[b]fluoranthene | SO | 14 | mg/kg | <0.014 | 0.028 | 0.00 | n.d. | 0.01 | n.d. | 0.03 | 3 | 21 | 0 | 0 | 2.9 | 0 | 0 | 0.16 | 0 | 0 | 0.041 |
| SVOC | Benzo[g,h,i]perylene | SO | 14 | mg/kg | <0.02 | <0.022 | n.d. | n.d. | n.d. | n.d. | n.d. | 0 | 0 | - | - | - | - | - | - | - | - | - |
| SVOC | Benzo[k]fluoranthene | SO | 14 | mg/kg | <0.015 | <0.017 | n.d. | n.d. | n.d. | n.d. | n.d. | 0 | 0 | 0 | 0 | 29 | 0 | 0 | 1.6 | 0 | 0 | 0.4 |

**Table 20. Borrow Pit Area Intermediate Soil Analytical Results Statistical Summary**
**Columbia Falls Aluminum Company, LLC, Phase I Site Characterization, 2000 Aluminum Drive, Columbia Falls, MT**



| | | | | | | | | | | | | | | Industrial RSL | | | Residential RSL | | | Risk SSL | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Group | Analyte | Matrix | No. of Results | Unit | Min | Max | Mean | Median | Standard Deviation | 5th Percentile | 95th Percentile | # > LOD | % > LOD | No. Exceeding | % Exceeding | Action Level | No. Exceeding | % Exceeding | Action Level | No. Exceeding | % Exceeding | Action Level |
| SVOC | Bis(2-chloroethoxy)methane | SO | 14 | mg/kg | <0.011 | <0.012 | n.d. | n.d. | n.d. | n.d. | n.d. | 0 | 0 | 0 | 0 | 250 | 0 | 0 | 19 | 0 | 0 | 0.0013 |
| SVOC | Bis(2-chloroethyl)ether | SO | 14 | mg/kg | <0.0082 | <0.0092 | n.d. | n.d. | n.d. | n.d. | n.d. | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0.23 | 0 | 0 | 0.0000036 |
| SVOC | Bis(2-ethylhexyl) phthalate | SO | 14 | mg/kg | <0.014 | <0.015 | n.d. | n.d. | n.d. | n.d. | n.d. | 0 | 0 | 0.00 | 0 | 160 | 0 | 0 | 39 | 0 | 0 | 1.3 |
| SVOC | Butyl benzyl phthalate | SO | 14 | mg/kg | <0.011 | <0.012 | n.d. | n.d. | n.d. | n.d. | n.d. | 0 | 0 | 0 | 0 | 1200 | 0 | 0 | 290 | 0 | 0 | 0.24 |
| SVOC | Caprolactam | SO | 14 | mg/kg | <0.025 | <0.028 | n.d. | n.d. | n.d. | n.d. | n.d. | 0 | 0 | 0 | 0 | 40000 | 0 | 0 | 3100 | 0 | 0 | 0.25 |
| SVOC | Carbazole | SO | 14 | mg/kg | <0.0086 | <0.0097 | n.d. | n.d. | n.d. | n.d. | n.d. | 0 | 0 | - | - | - | - | - | - | - | - | - |
| SVOC | Chrysene | SO | 14 | mg/kg | <0.0094 | 0.018 | n.d. | n.d. | n.d. | n.d. | 0.02 | 2 | 14 | 0 | 0 | 290 | 0 | 0 | 16 | 0 | 0 | 1.2 |
| SVOC | Dibenz(a,h)anthracene | SO | 14 | mg/kg | <0.018 | <0.02 | n.d. | n.d. | n.d. | n.d. | n.d. | 0 | 0 | 0 | 0 | 0.29 | 0 | 0 | 0.016 | 0 | 0 | 0.013 |
| SVOC | Dibenzofuran | SO | 14 | mg/kg | <0.01 | <0.012 | n.d. | n.d. | n.d. | n.d. | n.d. | 0 | 0 | 0.00 | 0 | 100 | 0 | 0 | 7.3 | 0 | 0 | 0.015 |
| SVOC | Diethyl phthalate | SO | 14 | mg/kg | <0.0099 | <0.011 | n.d. | n.d. | n.d. | n.d. | n.d. | 0 | 0 | 0.00 | 0 | 66000 | 0 | 0 | 5100 | 0 | 0 | 0.61 |
| SVOC | Dimethyl phthalate | SO | 14 | mg/kg | <0.01 | <0.011 | n.d. | n.d. | n.d. | n.d. | n.d. | 0 | 0 | - | - | - | - | - | - | - | - | - |
| SVOC | Di-n-butyl phthalate | SO | 14 | mg/kg | <0.01 | <0.012 | n.d. | n.d. | n.d. | n.d. | n.d. | 0 | 0 | 0 | 0 | 8200 | 0 | 0 | 630 | 0 | 0 | 0.23 |
| SVOC | Di-n-octyl phthalate | SO | 14 | mg/kg | <0.018 | <0.02 | n.d. | n.d. | n.d. | n.d. | n.d. | 0 | 0 | 0 | 0 | 820 | 0 | 0 | 63 | 0 | 0 | 5.7 |
| SVOC | Fluoranthene | SO | 14 | mg/kg | <0.01 | 0.013 | n.d. | n.d. | n.d. | n.d. | 0.01 | 2 | 14 | 0 | 0 | 3000 | 0 | 0 | 240 | 0 | 0 | 8.9 |
| SVOC | Fluorene | SO | 14 | mg/kg | <0.0075 | <0.0085 | n.d. | n.d. | n.d. | n.d. | n.d. | 0 | 0 | 0 | 0 | 3000 | 0 | 0 | 240 | 0 | 0 | 0.54 |
| SVOC | Hexachlorobenzene | SO | 14 | mg/kg | <0.014 | <0.016 | n.d. | n.d. | n.d. | n.d. | n.d. | 0 | 0 | 0 | 0 | 0.96 | 0 | 0 | 0.21 | 0 | 0 | 0.00012 |
| SVOC | Hexachlorobutadiene | SO | 14 | mg/kg | <0.0097 | <0.011 | n.d. | n.d. | n.d. | n.d. | n.d. | 0 | 0 | 0.00 | 0 | 5.3 | 0 | 0 | 1.2 | 0 | 0 | 0.00027 |
| SVOC | Hexachlorocyclopentadiene | SO | 14 | mg/kg | <0.022 | <0.024 | n.d. | n.d. | n.d. | n.d. | n.d. | 0 | 0 | 0 | 0 | 0.75 | 0 | 0 | 0.18 | 0 | 0 | 0.00013 |
| SVOC | Hexachloroethane | SO | 14 | mg/kg | <0.013 | <0.014 | n.d. | n.d. | n.d. | n.d. | n.d. | 0 | 0 | 0.00 | 0 | 8 | 0 | 0 | 1.8 | 0 | 0 | 0.0002 |
| SVOC | Indeno[1,2,3-cd]pyrene | SO | 14 | mg/kg | <0.023 | <0.026 | n.d. | n.d. | n.d. | n.d. | n.d. | 0 | 0 | 0 | 0 | 2.9 | 0 | 0 | 0.16 | 0 | 0 | 0.13 |
| SVOC | Isophorone | SO | 14 | mg/kg | <0.0074 | <0.0084 | n.d. | n.d. | n.d. | n.d. | n.d. | 0 | 0 | 0 | 0 | 2400 | 0 | 0 | 570 | 0 | 0 | 0.026 |
| SVOC | Naphthalene | SO | 14 | mg/kg | <0.0088 | <0.0099 | n.d. | n.d. | n.d. | n.d. | n.d. | 0 | 0 | 0.00 | 0 | 17 | 0 | 0 | 3.8 | 0 | 0 | 0.00054 |
| SVOC | Nitrobenzene | SO | 14 | mg/kg | <0.011 | <0.012 | n.d. | n.d. | n.d. | n.d. | n.d. | 0 | 0 | 0 | 0 | 22 | 0 | 0 | 5.1 | 0 | 0 | 0.000092 |
| SVOC | N-Nitrosodi-n-propylamine | SO | 14 | mg/kg | <0.012 | <0.013 | n.d. | n.d. | n.d. | n.d. | n.d. | 0 | 0 | 0 | 0 | 0.33 | 0 | 0 | 0.078 | 0 | 0 | 0.0000081 |
| SVOC | N-Nitrosodiphenylamine | SO | 14 | mg/kg | <0.031 | <0.035 | n.d. | n.d. | n.d. | n.d. | n.d. | 0 | 0 | 0 | 0 | 470 | 0 | 0 | 110 | 0 | 0 | 0.067 |
| SVOC | Pentachlorophenol | SO | 14 | mg/kg | <0.042 | <0.047 | n.d. | n.d. | n.d. | n.d. | n.d. | 0 | 0 | 0 | 0 | 4 | 0 | 0 | 1 | 0 | 0 | 0.000057 |
| SVOC | Phenanthrene | SO | 14 | mg/kg | <0.0092 | 0.0098 | n.d. | n.d. | n.d. | n.d. | 0.01 | 1 | 7 | - | - | - | - | - | - | - | - | - |
| SVOC | Phenol | SO | 14 | mg/kg | <0.011 | <0.013 | n.d. | n.d. | n.d. | n.d. | n.d. | 0 | 0 | 0 | 0 | 25000 | 0 | 0 | 1900 | 0 | 0 | 0.33 |
| SVOC | Pyrene | SO | 14 | mg/kg | <0.016 | <0.018 | n.d. | n.d. | n.d. | n.d. | n.d. | 0 | 0 | 0 | 0 | 2300 | 0 | 0 | 180 | 0 | 0 | 1.3 |
| VOC | 1,1,1-Trichloroethane | SO | 14 | mg/kg | <0.0003 | <0.00044 | n.d. | n.d. | n.d. | n.d. | n.d. | 0 | 0 | 0 | 0 | 3600 | 0 | 0 | 810 | 0 | 0 | 0.28 |
| VOC | 1,1,2,2-Tetrachloroethane | SO | 14 | mg/kg | <0.00013 | <0.0002 | n.d. | n.d. | n.d. | n.d. | n.d. | 0 | 0 | 0 | 0 | 2.7 | 0 | 0 | 0.6 | 0 | 0 | 0.00003 |
| VOC | 1,1,2-Trichloro-1,2,2-trifluoroethane | SO | 14 | mg/kg | <0.00035 | <0.00051 | n.d. | n.d. | n.d. | n.d. | n.d. | 0 | 0 | 0 | 0 | 17000 | 0 | 0 | 4000 | 0 | 0 | 14 |
| VOC | 1,1,2-Trichloroethane | SO | 14 | mg/kg | <0.00022 | <0.00032 | n.d. | n.d. | n.d. | n.d. | n.d. | 0 | 0 | 0.00 | 0 | 0.63 | 0 | 0 | 0.15 | 0 | 0 | 0.000013 |
| VOC | 1,1-Dichloroethane | SO | 14 | mg/kg | <0.00027 | <0.00039 | n.d. | n.d. | n.d. | n.d. | n.d. | 0 | 0 | 0 | 0 | 16 | 0 | 0 | 3.6 | 0 | 0 | 0.00078 |
| VOC | 1,1-Dichloroethene | SO | 14 | mg/kg | <0.00032 | <0.00047 | n.d. | n.d. | n.d. | n.d. | n.d. | 0 | 0 | 0 | 0 | 100 | 0 | 0 | 23 | 0 | 0 | 0.01 |
| VOC | 1,2,3-Trichlorobenzene | SO | 14 | mg/kg | <8.7E-05 | <0.00013 | n.d. | n.d. | n.d. | n.d. | n.d. | 0 | 0 | 0 | 0 | 93 | 0 | 0 | 6.3 | 0 | 0 | 0.0021 |
| VOC | 1,2,4-Trichlorobenzene | SO | 14 | mg/kg | <0.00025 | <0.00037 | n.d. | n.d. | n.d. | n.d. | n.d. | 0 | 0 | 0 | 0 | 26 | 0 | 0 | 5.8 | 0 | 0 | 0.0012 |

**Table 20. Borrow Pit Area Intermediate Soil Analytical Results Statistical Summary**
**Columbia Falls Aluminum Company, LLC, Phase I Site Characterization, 2000 Aluminum Drive, Columbia Falls, MT**

| | | | | | | | | | | | | | | Industrial RSL | | | Residential RSL | | | Risk SSL | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Group | Analyte | Matrix | No. of Results | Unit | Min | Max | Mean | Median | Standard Deviation | 5th Percentile | 95th Percentile | # > LOD | % > LOD | No. Exceeding | % Exceeding | Action Level | No. Exceeding | % Exceeding | Action Level | No. Exceeding | % Exceeding | Action Level |
| VOC | 1,2-Dibromo-3-Chloropropane | SO | 14 | mg/kg | <0.00037 | <0.00054 | n.d. | n.d. | n.d. | n.d. | n.d. | 0 | 0 | 0 | 0 | 0.064 | 0 | 0 | 0.0053 | 0 | 0 | 0.00000014 |
| VOC | 1,2-Dichlorobenzene | SO | 14 | mg/kg | <0.00011 | <0.00016 | n.d. | n.d. | n.d. | n.d. | n.d. | 0 | 0 | 0.00 | 0 | 930 | 0 | 0 | 180 | 0 | 0 | 0.03 |
| VOC | 1,2-Dichloroethane | SO | 14 | mg/kg | <8.7E-05 | <0.00013 | n.d. | n.d. | n.d. | n.d. | n.d. | 0 | 0 | 0 | 0 | 2 | 0 | 0 | 0.46 | 0 | 0 | 0.000048 |
| VOC | 1,2-Dichloropropane | SO | 14 | mg/kg | <0.00013 | <0.0002 | n.d. | n.d. | n.d. | n.d. | n.d. | 0 | 0 | 0 | 0 | 4.4 | 0 | 0 | 1 | 0 | 0 | 0.00015 |
| VOC | 1,3-Dichlorobenzene | SO | 14 | mg/kg | <9.5E-05 | <0.00014 | n.d. | n.d. | n.d. | n.d. | n.d. | 0 | 0 | - | - | - | - | - | - | - | - | - |
| VOC | 1,4-Dichlorobenzene | SO | 14 | mg/kg | <0.0001 | <0.00015 | n.d. | n.d. | n.d. | n.d. | n.d. | 0 | 0 | 0 | 0 | 11 | 0 | 0 | 2.6 | 0 | 0 | 0.00046 |
| VOC | 2-Butanone (MEK) | SO | 14 | mg/kg | <0.00061 | 0.0048 | 0.00 | 0.00 | 0.00 | n.d. | 0.00 | 7 | 50 | 0 | 0 | 19000 | 0 | 0 | 2700 | 0 | 0 | 0.12 |
| VOC | 2-Hexanone | SO | 14 | mg/kg | <0.00074 | <0.0011 | n.d. | n.d. | n.d. | n.d. | n.d. | 0 | 0 | 0 | 0 | 130 | 0 | 0 | 20 | 0 | 0 | 0.00088 |
| VOC | 4-Methyl-2-pentanone (MIBK) | SO | 14 | mg/kg | <0.0018 | <0.0026 | n.d. | n.d. | n.d. | n.d. | n.d. | 0 | 0 | 0.00 | 0 | 14000 | 0 | 0 | 3300 | 0 | 0 | 0.14 |
| VOC | Acetone | SO | 14 | mg/kg | 0.0083 | 0.086 | 0.03 | 0.03 | 0.02 | 0.01 | 0.06 | 14 | 100 | 0.00 | 0 | 67000 | 0 | 0 | 6100 | 0 | 0 | 0.29 |
| VOC | Benzene | SO | 14 | mg/kg | <0.00016 | 0.0011 | n.d. | n.d. | n.d. | n.d. | 0.00 | 1 | 7 | 0 | 0 | 5.1 | 0 | 0 | 1.2 | 1 | 7 | 0.00023 |
| VOC | Bromoform | SO | 14 | mg/kg | <0.0001 | <0.00015 | n.d. | n.d. | n.d. | n.d. | n.d. | 0 | 0 | 0 | 0 | 86 | 0 | 0 | 19 | 0 | 0 | 0.00087 |
| VOC | Bromomethane | SO | 14 | mg/kg | <0.00025 | <0.00037 | n.d. | n.d. | n.d. | n.d. | n.d. | 0 | 0 | 0 | 0 | 3 | 0 | 0 | 0.68 | 0 | 0 | 0.00019 |
| VOC | Carbon disulfide | SO | 14 | mg/kg | <0.00034 | <0.0005 | n.d. | n.d. | n.d. | n.d. | n.d. | 0 | 0 | 0 | 0 | 350 | 0 | 0 | 77 | 0 | 0 | 0.024 |
| VOC | Carbon tetrachloride | SO | 14 | mg/kg | <0.00034 | <0.0005 | n.d. | n.d. | n.d. | n.d. | n.d. | 0 | 0 | 0 | 0 | 2.9 | 0 | 0 | 0.65 | 0 | 0 | 0.00018 |
| VOC | Chlorobenzene | SO | 14 | mg/kg | <0.00011 | <0.00016 | n.d. | n.d. | n.d. | n.d. | n.d. | 0 | 0 | 0 | 0 | 130 | 0 | 0 | 28 | 0 | 0 | 0.0053 |
| VOC | Chlorobromomethane | SO | 14 | mg/kg | <0.00013 | <0.0002 | n.d. | n.d. | n.d. | n.d. | n.d. | 0 | 0 | 0 | 0 | 63 | 0 | 0 | 15 | 0 | 0 | 0.0021 |
| VOC | Chlorodibromomethane | SO | 14 | mg/kg | <0.00012 | <0.00017 | n.d. | n.d. | n.d. | n.d. | n.d. | 0 | 0 | 0 | 0 | 39 | 0 | 0 | 8.3 | 0 | 0 | 0.00023 |
| VOC | Chloroethane | SO | 14 | mg/kg | <0.00028 | <0.0004 | n.d. | n.d. | n.d. | n.d. | n.d. | 0 | 0 | 0 | 0 | 5700 | 0 | 0 | 1400 | 0 | 0 | 0.59 |
| VOC | Chloroform | SO | 14 | mg/kg | <0.00017 | <0.00024 | n.d. | n.d. | n.d. | n.d. | n.d. | 0 | 0 | 0 | 0 | 1.4 | 0 | 0 | 0.32 | 0 | 0 | 0.000061 |
| VOC | Chloromethane | SO | 14 | mg/kg | <0.0003 | <0.00044 | n.d. | n.d. | n.d. | n.d. | n.d. | 0 | 0 | 0 | 0 | 46 | 0 | 0 | 11 | 0 | 0 | 0.0049 |
| VOC | cis-1,2-Dichloroethene | SO | 14 | mg/kg | <0.00017 | <0.00025 | n.d. | n.d. | n.d. | n.d. | n.d. | 0 | 0 | 0 | 0 | 230 | 0 | 0 | 16 | 0 | 0 | 0.0011 |
| VOC | cis-1,3-Dichloropropene | SO | 14 | mg/kg | <0.00012 | <0.00017 | n.d. | n.d. | n.d. | n.d. | n.d. | 0 | 0 | - | - | - | - | - | - | - | - | - |
| VOC | Cyclohexane | SO | 14 | mg/kg | <0.00036 | 0.0017 | n.d. | n.d. | n.d. | n.d. | 0.00 | 1 | 7 | 0 | 0 | 2700 | 0 | 0 | 650 | 0 | 0 | 1.3 |
| VOC | Dichlorobromomethane | SO | 14 | mg/kg | <0.0003 | <0.00044 | n.d. | n.d. | n.d. | n.d. | n.d. | 0 | 0 | 0 | 0 | 1.3 | 0 | 0 | 0.29 | 0 | 0 | 0.000036 |
| VOC | Dichlorodifluoromethane | SO | 14 | mg/kg | <0.00025 | <0.00037 | n.d. | n.d. | n.d. | n.d. | n.d. | 0 | 0 | 0 | 0 | 37 | 0 | 0 | 8.7 | 0 | 0 | 0.03 |
| VOC | Ethylbenzene | SO | 14 | mg/kg | <0.00014 | 0.00054 | n.d. | n.d. | n.d. | n.d. | 0.00 | 1 | 7 | 0 | 0 | 25 | 0 | 0 | 5.8 | 0 | 0 | 0.0017 |
| VOC | Ethylene Dibromide | SO | 14 | mg/kg | <9.5E-05 | <0.00014 | n.d. | n.d. | n.d. | n.d. | n.d. | 0 | 0 | 0 | 0 | 0.16 | 0 | 0 | 0.036 | 0 | 0 | 0.0000021 |
| VOC | Isopropylbenzene | SO | 14 | mg/kg | <0.00013 | <0.0002 | n.d. | n.d. | n.d. | n.d. | n.d. | 0 | 0 | 0.00 | 0 | 990 | 0 | 0 | 190 | 0 | 0 | 0.074 |
| VOC | Methyl acetate | SO | 14 | mg/kg | <0.00071 | 0.0082 | 0.00 | n.d. | 0.00 | n.d. | 0.01 | 3 | 21 | 0 | 0 | 120000 | 0 | 0 | 7800 | 0 | 0 | 0.41 |
| VOC | Methyl tert-butyl ether | SO | 14 | mg/kg | <0.00013 | <0.0002 | n.d. | n.d. | n.d. | n.d. | n.d. | 0 | 0 | 0 | 0 | 210 | 0 | 0 | 47 | 0 | 0 | 0.0032 |
| VOC | Methylcyclohexane | SO | 14 | mg/kg | <0.00039 | 0.0041 | n.d. | n.d. | n.d. | n.d. | 0.00 | 2 | 14 | - | - | - | - | - | - | - | - | - |
| VOC | Methylene Chloride | SO | 14 | mg/kg | <0.00025 | 0.0019 | n.d. | n.d. | n.d. | n.d. | 0.00 | 1 | 7 | 0 | 0 | 320 | 0 | 0 | 35 | 0 | 0 | 0.0027 |
| VOC | m-Xylene & p-Xylene | SO | 14 | mg/kg | <8.7E-05 | 0.0026 | n.d. | n.d. | n.d. | n.d. | 0.00 | 1 | 7 | 0 | 0 | 240 | 0 | 0 | 56 | - | - | - |
| VOC | o-Xylene | SO | 14 | mg/kg | <0.00013 | 0.0008 | n.d. | n.d. | n.d. | n.d. | 0.00 | 1 | 7 | 0 | 0 | 280 | 0 | 0 | 65 | 0 | 0 | 0.019 |
| VOC | Styrene | SO | 14 | mg/kg | <0.00012 | <0.00017 | n.d. | n.d. | n.d. | n.d. | n.d. | 0 | 0 | 0 | 0 | 3500 | 0 | 0 | 600 | 0 | 0 | 0.13 |
| VOC | Tetrachloroethene | SO | 14 | mg/kg | <0.00022 | <0.00032 | n.d. | n.d. | n.d. | n.d. | n.d. | 0 | 0 | 0 | 0 | 39 | 0 | 0 | 8.1 | 0 | 0 | 0.0018 |

**Table 20. Borrow Pit Area Intermediate Soil Analytical Results Statistical Summary**
**Columbia Falls Aluminum Company, LLC, Phase I Site Characterization, 2000 Aluminum Drive, Columbia Falls, MT**

| | | | | | | | | | | | | | | Industrial RSL | | | Residential RSL | | | Risk SSL | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Group | Analyte | Matrix | No. of Results | Unit | Min | Max | Mean | Median | Standard Deviation | 5th Percentile | 95th Percentile | # > LOD | % > LOD | No. Exceeding | % Exceeding | Action Level | No. Exceeding | % Exceeding | Action Level | No. Exceeding | % Exceeding | Action Level |
| VOC | Toluene | SO | 14 | mg/kg | <0.00015 | 0.0031 | 0.00 | n.d. | 0.00 | n.d. | 0.00 | 3 | 21 | 0 | 0 | 4700 | 0 | 0 | 490 | 0 | 0 | 0.076 |
| VOC | trans-1,2-Dichloroethene | SO | 14 | mg/kg | <0.00031 | <0.00045 | n.d. | n.d. | n.d. | n.d. | n.d. | 0 | 0 | 0.00 | 0 | 2300 | 0 | 0 | 160 | 0 | 0 | 0.011 |
| VOC | trans-1,3-Dichloropropene | SO | 14 | mg/kg | <7.9E-05 | <0.00012 | n.d. | n.d. | n.d. | n.d. | n.d. | 0 | 0 | - | - | - | - | - | - | - | - | - |
| VOC | Trichloroethene | SO | 14 | mg/kg | <0.00021 | <0.0003 | n.d. | n.d. | n.d. | n.d. | n.d. | 0 | 0 | 0 | 0 | 1.9 | 0 | 0 | 0.41 | 0 | 0 | 0.0001 |
| VOC | Trichlorofluoromethane | SO | 14 | mg/kg | <0.00027 | <0.00039 | n.d. | n.d. | n.d. | n.d. | n.d. | 0 | 0 | 0 | 0 | 35000 | 0 | 0 | 2300 | 0 | 0 | 0.33 |
| VOC | Vinyl chloride | SO | 14 | mg/kg | <0.00031 | <0.00045 | n.d. | n.d. | n.d. | n.d. | n.d. | 0 | 0 | 0 | 0 | 1.7 | 0 | 0 | 0.059 | 0 | 0 | 0.0000065 |

mg/kg - Milligrams per Kilograms
n.d - Non Detect
LOD - Limit of Detection
Industiral RSL - Environmental Protection Agency Industrial Soil Regional Screening Level
Residential RSL - Environmental Protection Agency Residnetial Soil Regional Screening Level
Risk SSL - Environmental Protection Agency Human Health Protection of Ground Water - Risk-based Soil Screening Level

**Table 21. Groundwater in Monitoring Wells Screened in Upper Hydrogeologic Unit Analytical Results Statistical Summary, Columbia Falls Aluminum Company, LLC, Phase I Site Characterization, 2000 Aluminum Drive, Columbia Falls, MT**

| Group | Analyte | Matrix | Fraction | No. of Results | Unit | Min | Max | Mean | Median | Standard Deviation | 5th Percentile | 95th Percentile | # > LOD | % > LOD | CFMW-001 STANDARD | | | DEQ 7 Human Health Standards | | | EPA Drinking MCL | | | EPA Tapwater RSL | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | | | | | | | | No. Exceeding | % Exceeding | Action Level | No. Exceeding | % Exceeding | Action Level | No. Exceeding | % Exceeding | Action Level | No. Exceeding | % Exceeding | Action Level |
| GENCHEM | Ammonia | WG | T | 47 | ug/l | <72 | 23600 | 580.94 | n.d. | 3437.05 | n.d. | 7948.00 | 15 | 32 | 15 | 32 | 72 | - | - | - | - | - | - | - | - | - |
| GENCHEM | Chloride | WG | N | 47 | ug/l | <30 | 39100 | 4488.30 | 2600.00 | 7003.82 | 1147.50 | 14782.50 | 46 | 98 | 45 | 96 | 611 | - | - | - | - | - | - | - | - | - |
| GENCHEM | Fluoride | WG | N | 47 | ug/l | <15 | 38400 | 3685.00 | 1920.00 | 7426.29 | 107.78 | 17275.00 | 46 | 98 | 43 | 91 | 91.7 | 7 | 15 | 4000 | 7 | 15 | 4000 | 44 | 94 | 80 |
| GENCHEM | Hardness as calcium carbonate | WG | T | 47 | ug/l | 28000 | 1000000 | 222893.62 | 206000.00 | 150765.47 | 67200.00 | 386400.00 | 47 | 100 | 23 | 49 | 206000 | - | - | - | - | - | - | - | - | - |
| GENCHEM | Nitrate Nitrite as N | WG | T | 47 | ug/l | <100 | 46200 | 4301.49 | 1520.00 | 9292.74 | n.d. | 19250.00 | 40 | 85 | 40 | 85 | 100 | 5 | 11 | 10000 | 5 | 11 | 10000 | - | - | - |
| GENCHEM | Orthophosphate as P | WG | N | 42 | ug/l | <42 | 267 | n.d. | n.d. | n.d. | n.d. | n.d. | 1 | 2 | 1.00 | 2 | 42 | - | - | - | - | - | - | - | - | - |
| GENCHEM | Sulfate | WG | N | 47 | ug/l | 3320 | 694000 | 35818.30 | 18300.00 | 100100.96 | 4581.00 | 80080.00 | 47 | 100 | 37 | 79 | 6600 | - | - | - | - | - | - | - | - | - |
| METALS | Aluminum | WG | D | 47 | ug/l | <9.1 | 1850 | n.d. | n.d. | n.d. | n.d. | 1371.20 | 7 | 15 | 7 | 15 | 18.2 | - | - | - | - | - | - | 0 | 0 | 2000 |
| METALS | Antimony | WG | D | 47 | ug/l | <0.31 | 1 | n.d. | n.d. | n.d. | n.d. | 0.97 | 3 | 6 | 3 | 6 | 0.62 | 0 | 0 | 6 | 0 | 0 | 6 | 1 | 2 | 0.78 |
| METALS | Arsenic | WG | D | 47 | ug/l | <0.32 | 47.7 | 1.72 | n.d. | 7.29 | n.d. | 36.43 | 9 | 19 | 8 | 17 | 0.64 | 2 | 4 | 10 | 2 | 4 | 10 | 9 | 19 | 0.052 |
| METALS | Barium | WG | D | 47 | ug/l | 28.6 | 701 | 198.07 | 163.00 | 128.82 | 65.66 | 464.80 | 47 | 100 | 16 | 34 | 228 | 0 | 0 | 1000 | 0 | 0 | 2000 | 3 | 6 | 380 |
| METALS | Beryllium | WG | D | 47 | ug/l | <0.12 | <0.24 | n.d. | n.d. | n.d. | n.d. | n.d. | 0 | 0 | 0.00 | 0 | 0.24 | 0 | 0 | 4 | 0 | 0 | 4 | 0 | 0 | 2.5 |
| METALS | Cadmium | WG | D | 47 | ug/l | <0.36 | <0.71 | n.d. | n.d. | n.d. | n.d. | n.d. | 0 | 0 | 0.00 | 0 | 0.71 | 0 | 0 | 5 | - | - | - | - | - | - |
| METALS | Calcium | WG | D | 47 | ug/l | 2710 | 388000 | 62820.00 | 51600.00 | 60370.12 | 9722.00 | 171100.00 | 47 | 100 | 10 | 21 | 60300 | - | - | - | - | - | - | - | - | - |
| METALS | Chromium | WG | D | 47 | ug/l | <0.66 | 4.2 | n.d. | n.d. | n.d. | n.d. | 4.15 | 6 | 13 | 6 | 13 | 1.3 | 0 | 0 | 100 | 0 | 0 | 100 | - | - | - |
| METALS | Cobalt | WG | D | 47 | ug/l | <0.65 | 27.8 | 1.77 | n.d. | 5.39 | n.d. | 26.16 | 13 | 28 | 8 | 17 | 1.3 | - | - | - | - | - | - | 13 | 28 | 0.6 |
| METALS | Copper | WG | D | 47 | ug/l | <1.4 | 46.8 | 3.72 | 3.10 | 7.16 | n.d. | 14.91 | 31 | 66 | 21 | 45 | 3.2 | 0 | 0 | 1300 | 0 | 0 | 1300 | 0 | 0 | 80 |
| METALS | Cyanide, Total | WG | T | 47 | ug/l | <2 | 7320 | 603.02 | 104.00 | 1443.09 | n.d. | 2726.50 | 43 | 91 | 39 | 83 | 2.4 | 21 | 45 | 200 | 21 | 45 | 200 | 43 | 91 | 0.15 |
| METALS | Iron | WG | D | 47 | ug/l | <42.4 | 4710 | 302.97 | 55.10 | 788.76 | n.d. | 2202.50 | 26 | 55 | 25 | 53 | 42.4 | - | - | - | - | - | - | 2 | 4 | 1400 |
| METALS | Lead | WG | D | 47 | ug/l | <0.19 | 2.8 | n.d. | n.d. | n.d. | n.d. | 2.60 | 3 | 6 | 3 | 6 | 0.38 | 0 | 0 | 15 | 0 | 0 | 15 | 0 | 0 | 15 |
| METALS | Magnesium | WG | D | 47 | ug/l | <63.6 | 45800 | 14156.21 | 15500.00 | 7628.48 | 4022.50 | 19700.00 | 46 | 98 | 28 | 60 | 14100 | - | - | - | - | - | - | - | - | - |
| METALS | Manganese | WG | D | 47 | ug/l | <1.2 | 1450 | 74.77 | 3.10 | 229.08 | n.d. | 510.50 | 25 | 53 | 24 | 51 | 2.5 | - | - | - | - | - | - | - | - | - |
| METALS | Mercury | WG | D | 47 | ug/l | <0.17 | <0.17 | n.d. | n.d. | n.d. | n.d. | n.d. | 0 | 0 | 0.00 | 0 | 0.17 | 0 | 0 | 2 | 0 | 0 | 2 | 0 | 0 | 0.063 |
| METALS | Nickel | WG | D | 47 | ug/l | <0.68 | 7.7 | n.d. | n.d. | n.d. | n.d. | 7.30 | 5 | 11 | 4 | 9 | 1.4 | 0 | 0 | 100 | - | - | - | - | - | - |
| METALS | Potassium | WG | D | 47 | ug/l | 318 | 19700 | 2017.51 | 1000.00 | 3674.01 | 585.30 | 3939.00 | 47 | 100 | 40 | 85 | 740 | - | - | - | - | - | - | - | - | - |
| METALS | Selenium | WG | D | 47 | ug/l | <0.37 | 13.5 | n.d. | n.d. | n.d. | n.d. | 11.70 | 7 | 15 | 7 | 15 | 0.73 | 0 | 0 | 50 | 0 | 0 | 50 | 1 | 2 | 10 |
| METALS | Silver | WG | D | 47 | ug/l | <0.64 | <1.3 | n.d. | n.d. | n.d. | n.d. | n.d. | 0 | 0 | 0.00 | 0 | 1.3 | 0 | 0 | 100 | - | - | - | 0 | 0 | 9.4 |
| METALS | Sodium | WG | D | 47 | ug/l | 3050 | 620000 | 69977.66 | 31100.00 | 118971.52 | 4894.00 | 293200.00 | 47 | 100 | 41 | 87 | 8360 | - | - | - | - | - | - | - | - | - |
| METALS | Thallium | WG | D | 47 | ug/l | <0.13 | <0.26 | n.d. | n.d. | n.d. | n.d. | n.d. | 0 | 0 | 0.00 | 0 | 0.26 | 0 | 0 | 2 | 0 | 0 | 2 | 0 | 0 | 0.02 |
| METALS | Vanadium | WG | D | 47 | ug/l | <0.95 | 50.4 | n.d. | n.d. | n.d. | n.d. | 44.28 | 7 | 15 | 5 | 11 | 1.9 | - | - | - | - | - | - | 3 | 6 | 8.6 |
| METALS | Zinc | WG | D | 47 | ug/l | <3.5 | 27.8 | n.d. | n.d. | n.d. | n.d. | 25.48 | 4 | 9 | 4 | 9 | 7 | 0 | 0 | 2000 | - | - | - | 0 | 0 | 600 |
| SVOC | 1,1'-Biphenyl | WG | N | 38 | ug/l | <0.63 | <0.68 | n.d. | n.d. | n.d. | n.d. | n.d. | 0 | 0 | - | - | - | - | - | - | - | - | - | 0 | 0 | 0.083 |
| SVOC | 1,2,4,5-Tetrachlorobenzene | WG | N | 38 | ug/l | <0.43 | <0.47 | n.d. | n.d. | n.d. | n.d. | n.d. | 0 | 0 | - | - | - | 0 | 0 | 0.97 | - | - | - | 0 | 0 | 0.17 |
| SVOC | 1,4-Dioxane | WG | N | 38 | ug/l | <3.1 | <3.4 | n.d. | n.d. | n.d. | n.d. | n.d. | 0 | 0 | - | - | - | - | - | - | - | - | - | 0 | 0 | 0.46 |
| SVOC | 2,2'-oxybis[1-chloropropane] | WG | N | 38 | ug/l | <0.93 | <1 | n.d. | n.d. | n.d. | n.d. | n.d. | 0 | 0 | - | - | - | 0 | 0 | 1400 | - | - | - | - | - | - |
| SVOC | 2,3,4,6-Tetrachlorophenol | WG | N | 38 | ug/l | <0.69 | <0.75 | n.d. | n.d. | n.d. | n.d. | n.d. | 0 | 0 | - | - | - | - | - | - | - | - | - | 0 | 0 | 24 |
| SVOC | 2,4,5-Trichlorophenol | WG | N | 38 | ug/l | <0.49 | <0.53 | n.d. | n.d. | n.d. | n.d. | n.d. | 0 | 0 | - | - | - | 0 | 0 | 1800 | - | - | - | 0 | 0 | 120 |

**Table 21. Groundwater in Monitoring Wells Screened in Upper Hydrogeologic Unit Analytical Results Statistical Summary, Columbia Falls Aluminum Company, LLC, Phase I Site Characterization, 2000 Aluminum Drive, Columbia Falls, MT**

| | | | | | | | | | | | | | | | CFMW-001 STANDARD | | | DEQ 7 Human Health Standards | | | EPA Drinking MCL | | | EPA Tapwater RSL | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Group | Analyte | Matrix | Fraction | No. of Results | Unit | Min | Max | Mean | Median | Standard Deviation | 5th Percentile | 95th Percentile | # > LOD | % > LOD | No. Exceeding | % Exceeding | Action Level | No. Exceeding | % Exceeding | Action Level | No. Exceeding | % Exceeding | Action Level | No. Exceeding | % Exceeding | Action Level |
| SVOC | 2,4,6-Trichlorophenol | WG | N | 38 | ug/l | <0.53 | <0.58 | n.d. | n.d. | n.d. | n.d. | n.d. | 0 | 0 | - | - | - | 0 | 0 | 30 | - | - | - | 0 | 0 | 1.2 |
| SVOC | 2,4-Dichlorophenol | WG | N | 38 | ug/l | <0.63 | <0.68 | n.d. | n.d. | n.d. | n.d. | n.d. | 0 | 0 | - | - | - | 0 | 0 | 77 | - | - | - | 0 | 0 | 4.6 |
| SVOC | 2,4-Dimethylphenol | WG | N | 38 | ug/l | <0.91 | <0.99 | n.d. | n.d. | n.d. | n.d. | n.d. | 0 | 0 | - | - | - | 0 | 0 | 380 | - | - | - | 0 | 0 | 36 |
| SVOC | 2,4-Dinitrophenol | WG | N | 38 | ug/l | <2.4 | <2.6 | n.d. | n.d. | n.d. | n.d. | n.d. | 0 | 0 | - | - | - | 0 | 0 | 69 | - | - | - | 0 | 0 | 3.9 |
| SVOC | 2,4-Dinitrotoluene | WG | N | 38 | ug/l | <1 | <1.1 | n.d. | n.d. | n.d. | n.d. | n.d. | 0 | 0 | - | - | - | 0 | 0 | 1.1 | - | - | - | 0 | 0 | 0.24 |
| SVOC | 2,6-Dinitrotoluene | WG | N | 38 | ug/l | <0.88 | <0.96 | n.d. | n.d. | n.d. | n.d. | n.d. | 0 | 0 | - | - | - | 0 | 0 | 0.5 | - | - | - | 0 | 0 | 0.049 |
| SVOC | 2-Chloronaphthalene | WG | N | 38 | ug/l | <0.61 | <0.66 | n.d. | n.d. | n.d. | n.d. | n.d. | 0 | 0 | - | - | - | 0 | 0 | 1000 | - | - | - | - | - | - |
| SVOC | 2-Chlorophenol | WG | N | 38 | ug/l | <0.74 | <0.8 | n.d. | n.d. | n.d. | n.d. | n.d. | 0 | 0 | - | - | - | 0 | 0 | 81 | - | - | - | 0 | 0 | 9.1 |
| SVOC | 2-Methylnaphthalene | WG | N | 38 | ug/l | <0.88 | <0.96 | n.d. | n.d. | n.d. | n.d. | n.d. | 0 | 0 | - | - | - | - | - | - | - | - | - | 0 | 0 | 3.6 |
| SVOC | 2-Methylphenol | WG | N | 38 | ug/l | <1.3 | <1.4 | n.d. | n.d. | n.d. | n.d. | n.d. | 0 | 0 | - | - | - | - | - | - | - | - | - | - | - | - |
| SVOC | 2-Nitroaniline | WG | N | 38 | ug/l | <0.65 | <0.71 | n.d. | n.d. | n.d. | n.d. | n.d. | 0 | 0 | - | - | - | - | - | - | - | - | - | 0 | 0 | 19 |
| SVOC | 2-Nitrophenol | WG | N | 38 | ug/l | <0.59 | <0.64 | n.d. | n.d. | n.d. | n.d. | n.d. | 0 | 0 | - | - | - | - | - | - | - | - | - | - | - | - |
| SVOC | 3 & 4 Methylphenol | WG | N | 38 | ug/l | <0.88 | <0.96 | n.d. | n.d. | n.d. | n.d. | n.d. | 0 | 0 | - | - | - | - | - | - | - | - | - | - | - | - |
| SVOC | 3,3'-Dichlorobenzidine | WG | N | 38 | ug/l | <1 | <1.1 | n.d. | n.d. | n.d. | n.d. | n.d. | 0 | 0 | - | - | - | 0 | 0 | 0.21 | - | - | - | 0 | 0 | 0.13 |
| SVOC | 3-Nitroaniline | WG | N | 38 | ug/l | <0.82 | <0.89 | n.d. | n.d. | n.d. | n.d. | n.d. | 0 | 0 | - | - | - | - | - | - | - | - | - | - | - | - |
| SVOC | 4,6-Dinitro-2-methylphenol | WG | N | 38 | ug/l | <2 | 2.2 | n.d. | n.d. | n.d. | n.d. | n.d. | 1 | 3 | - | - | - | 0 | 0 | 13 | - | - | - | - | - | - |
| SVOC | 4-Bromophenyl phenyl ether | WG | N | 38 | ug/l | <1 | <1.1 | n.d. | n.d. | n.d. | n.d. | n.d. | 0 | 0 | - | - | - | - | - | - | - | - | - | - | - | - |
| SVOC | 4-Chloro-3-methylphenol | WG | N | 38 | ug/l | <0.76 | <0.83 | n.d. | n.d. | n.d. | n.d. | n.d. | 0 | 0 | - | - | - | 0 | 0 | 3000 | - | - | - | - | - | - |
| SVOC | 4-Chloroaniline | WG | N | 38 | ug/l | <0.73 | <0.79 | n.d. | n.d. | n.d. | n.d. | n.d. | 0 | 0 | - | - | - | - | - | - | - | - | - | 0 | 0 | 0.37 |
| SVOC | 4-Chlorophenyl phenyl ether | WG | N | 38 | ug/l | <0.96 | <1 | n.d. | n.d. | n.d. | n.d. | n.d. | 0 | 0 | - | - | - | - | - | - | - | - | - | - | - | - |
| SVOC | 4-Nitroaniline | WG | N | 38 | ug/l | <0.48 | <0.52 | n.d. | n.d. | n.d. | n.d. | n.d. | 0 | 0 | - | - | - | - | - | - | - | - | - | 0 | 0 | 3.8 |
| SVOC | 4-Nitrophenol | WG | N | 38 | ug/l | <4.7 | <5.1 | n.d. | n.d. | n.d. | n.d. | n.d. | 0 | 0 | - | - | - | 0 | 0 | 60 | - | - | - | - | - | - |
| SVOC | Acenaphthene | WG | N | 38 | ug/l | <0.88 | <0.96 | n.d. | n.d. | n.d. | n.d. | n.d. | 0 | 0 | - | - | - | 0 | 0 | 670 | - | - | - | 0 | 0 | 53 |
| SVOC | Acenaphthylene | WG | N | 38 | ug/l | <0.65 | <0.71 | n.d. | n.d. | n.d. | n.d. | n.d. | 0 | 0 | - | - | - | - | - | - | - | - | - | - | - | - |
| SVOC | Acetophenone | WG | N | 38 | ug/l | <1 | <1.1 | n.d. | n.d. | n.d. | n.d. | n.d. | 0 | 0 | - | - | - | - | - | - | - | - | - | 0 | 0 | 190 |
| SVOC | Anthracene | WG | N | 38 | ug/l | <0.57 | <0.62 | n.d. | n.d. | n.d. | n.d. | n.d. | 0 | 0 | - | - | - | 0 | 0 | 2100 | - | - | - | 0 | 0 | 180 |
| SVOC | Atrazine | WG | N | 38 | ug/l | <0.77 | <0.84 | n.d. | n.d. | n.d. | n.d. | n.d. | 0 | 0 | - | - | - | 0 | 0 | 3 | 0 | 0 | 3 | 0 | 0 | 0.3 |
| SVOC | Benzaldehyde | WG | N | 38 | ug/l | <0.86 | <0.93 | n.d. | n.d. | n.d. | n.d. | n.d. | 0 | 0 | - | - | - | - | - | - | - | - | - | 0 | 0 | 190 |
| SVOC | Benzo[a]anthracene | WG | N | 38 | ug/l | <0.55 | <0.6 | n.d. | n.d. | n.d. | n.d. | n.d. | 0 | 0 | - | - | - | 0 | 0 | 0.5 | - | - | - | - | - | - |
| SVOC | Benzo[a]pyrene | WG | N | 38 | ug/l | <0.16 | <0.17 | n.d. | n.d. | n.d. | n.d. | n.d. | 0 | 0 | - | - | - | 0 | 0 | 0.05 | 0 | 0 | 0.2 | 0 | 0 | 0.0034 |
| SVOC | Benzo[b]fluoranthene | WG | N | 38 | ug/l | <0.44 | <0.48 | n.d. | n.d. | n.d. | n.d. | n.d. | 0 | 0 | - | - | - | 0 | 0 | 0.5 | - | - | - | 0 | 0 | 0.034 |
| SVOC | Benzo[g,h,i]perylene | WG | N | 38 | ug/l | <0.75 | <0.82 | n.d. | n.d. | n.d. | n.d. | n.d. | 0 | 0 | - | - | - | - | - | - | - | - | - | - | - | - |
| SVOC | Benzo[k]fluoranthene | WG | N | 38 | ug/l | <0.18 | <0.2 | n.d. | n.d. | n.d. | n.d. | n.d. | 0 | 0 | - | - | - | 0 | 0 | 5 | - | - | - | 0 | 0 | 0.34 |
| SVOC | Bis(2-chloroethoxy)methane | WG | N | 38 | ug/l | <0.69 | <0.75 | n.d. | n.d. | n.d. | n.d. | n.d. | 0 | 0 | - | - | - | - | - | - | - | - | - | 0 | 0 | 5.9 |
| SVOC | Bis(2-chloroethyl)ether | WG | N | 38 | ug/l | <0.12 | <0.13 | n.d. | n.d. | n.d. | n.d. | n.d. | 0 | 0 | - | - | - | 0 | 0 | 0.3 | - | - | - | 0 | 0 | 0.014 |
| SVOC | Bis(2-ethylhexyl) phthalate | WG | N | 38 | ug/l | <0.72 | 1.1 | n.d. | n.d. | n.d. | n.d. | 1.10 | 2 | 5 | - | - | - | 0 | 0 | 6 | 0 | 0 | 6 | 0 | 0 | 5.6 |
| SVOC | Butyl benzyl phthalate | WG | N | 38 | ug/l | <0.6 | <0.65 | n.d. | n.d. | n.d. | n.d. | n.d. | 0 | 0 | - | - | - | 0 | 0 | 1500 | - | - | - | 0 | 0 | 16 |

**Table 21. Groundwater in Monitoring Wells Screened in Upper Hydrogeologic Unit Analytical Results Statistical Summary, Columbia Falls Aluminum Company, LLC, Phase I Site Characterization, 2000 Aluminum Drive, Columbia Falls, MT**

| | | | | | | | | | | | | | | | CFMW-001 STANDARD | | | DEQ 7 Human Health Standards | | | EPA Drinking MCL | | | EPA Tapwater RSL | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Group | Analyte | Matrix | Fraction | No. of Results | Unit | Min | Max | Mean | Median | Standard Deviation | 5th Percentile | 95th Percentile | # > LOD | % > LOD | No. Exceeding | % Exceeding | Action Level | No. Exceeding | % Exceeding | Action Level | No. Exceeding | % Exceeding | Action Level | No. Exceeding | % Exceeding | Action Level |
| SVOC | Caprolactam | WG | N | 38 | ug/l | <1.1 | <1.1 | n.d. | n.d. | n.d. | n.d. | n.d. | 0 | 0 | - | - | - | - | - | - | - | - | - | 0 | 0 | 990 |
| SVOC | Carbazole | WG | N | 38 | ug/l | <0.85 | <0.92 | n.d. | n.d. | n.d. | n.d. | n.d. | 0 | 0 | - | - | - | - | - | - | - | - | - | - | - | - |
| SVOC | Chrysene | WG | N | 38 | ug/l | <0.67 | <0.73 | n.d. | n.d. | n.d. | n.d. | n.d. | 0 | 0 | - | - | - | 0 | 0 | 50 | - | - | - | 0 | 0 | 3.4 |
| SVOC | Dibenz(a,h)anthracene | WG | N | 38 | ug/l | <0.09 | <0.098 | n.d. | n.d. | n.d. | n.d. | n.d. | 0 | 0 | - | - | - | 0 | 0 | 0.05 | - | - | - | 0 | 0 | 0.0034 |
| SVOC | Dibenzofuran | WG | N | 38 | ug/l | <0.85 | <0.92 | n.d. | n.d. | n.d. | n.d. | n.d. | 0 | 0 | - | - | - | - | - | - | - | - | - | 0 | 0 | 0.79 |
| SVOC | Diethyl phthalate | WG | N | 38 | ug/l | <1 | <1.1 | n.d. | n.d. | n.d. | n.d. | n.d. | 0 | 0 | - | - | - | 0 | 0 | 17000 | - | - | - | - | - | - |
| SVOC | Dimethyl phthalate | WG | N | 38 | ug/l | <0.98 | <1.1 | n.d. | n.d. | n.d. | n.d. | n.d. | 0 | 0 | - | - | - | 0 | 0 | ### | - | - | - | - | - | - |
| SVOC | Di-n-butyl phthalate | WG | N | 38 | ug/l | <0.82 | <0.89 | n.d. | n.d. | n.d. | n.d. | n.d. | 0 | 0 | - | - | - | 0 | 0 | 2000 | - | - | - | - | - | - |
| SVOC | Di-n-octyl phthalate | WG | N | 38 | ug/l | <0.69 | <0.75 | n.d. | n.d. | n.d. | n.d. | n.d. | 0 | 0 | - | - | - | - | - | - | - | - | - | 0 | 0 | 20 |
| SVOC | Fluoranthene | WG | N | 38 | ug/l | <0.72 | <0.78 | n.d. | n.d. | n.d. | n.d. | n.d. | 0 | 0 | - | - | - | 0 | 0 | 130 | - | - | - | 0 | 0 | 80 |
| SVOC | Fluorene | WG | N | 38 | ug/l | <0.8 | <0.87 | n.d. | n.d. | n.d. | n.d. | n.d. | 0 | 0 | - | - | - | 0 | 0 | 1100 | - | - | - | 0 | 0 | 29 |
| SVOC | Hexachlorobenzene | WG | N | 38 | ug/l | <0.47 | <0.51 | n.d. | n.d. | n.d. | n.d. | n.d. | 0 | 0 | - | - | - | 0 | 0 | 0.2 | 0 | 0 | 1 | 0 | 0 | 0.0098 |
| SVOC | Hexachlorobutadiene | WG | N | 38 | ug/l | <0.76 | <0.83 | n.d. | n.d. | n.d. | n.d. | n.d. | 0 | 0 | - | - | - | 0 | 0 | 5 | - | - | - | 0 | 0 | 0.14 |
| SVOC | Hexachlorocyclopentadiene | WG | N | 38 | ug/l | <0.61 | <0.66 | n.d. | n.d. | n.d. | n.d. | n.d. | 0 | 0 | - | - | - | 0 | 0 | 50 | 0 | 0 | 50 | 0 | 0 | 0.041 |
| SVOC | Hexachloroethane | WG | N | 38 | ug/l | <0.09 | <0.098 | n.d. | n.d. | n.d. | n.d. | n.d. | 0 | 0 | - | - | - | 0 | 0 | 30 | - | - | - | 0 | 0 | 0.33 |
| SVOC | Indeno[1,2,3-cd]pyrene | WG | N | 38 | ug/l | <0.21 | <0.23 | n.d. | n.d. | n.d. | n.d. | n.d. | 0 | 0 | - | - | - | 0 | 0 | 0.5 | - | - | - | 0 | 0 | 0.034 |
| SVOC | Isophorone | WG | N | 38 | ug/l | <0.67 | <0.73 | n.d. | n.d. | n.d. | n.d. | n.d. | 0 | 0 | - | - | - | 0 | 0 | 400 | - | - | - | 0 | 0 | 78 |
| SVOC | Naphthalene | WG | N | 38 | ug/l | <0.8 | <0.87 | n.d. | n.d. | n.d. | n.d. | n.d. | 0 | 0 | - | - | - | 0 | 0 | 100 | - | - | - | 0 | 0 | 0.17 |
| SVOC | Nitrobenzene | WG | N | 38 | ug/l | <0.49 | <0.53 | n.d. | n.d. | n.d. | n.d. | n.d. | 0 | 0 | - | - | - | 0 | 0 | 17 | - | - | - | 0 | 0 | 0.14 |
| SVOC | N-Nitrosodi-n-propylamine | WG | N | 38 | ug/l | <0.83 | <0.9 | n.d. | n.d. | n.d. | n.d. | n.d. | 0 | 0 | - | - | - | 0 | 0 | 0.5 | - | - | - | 0 | 0 | 0.011 |
| SVOC | N-Nitrosodiphenylamine | WG | N | 38 | ug/l | <0.74 | <0.8 | n.d. | n.d. | n.d. | n.d. | n.d. | 0 | 0 | - | - | - | 0 | 0 | 33 | - | - | - | 0 | 0 | 12 |
| SVOC | Pentachlorophenol | WG | N | 21 | ug/l | <2.2 | <2.4 | n.d. | n.d. | n.d. | n.d. | n.d. | 0 | 0 | - | - | - | 0 | 0 | 1 | 0 | 0 | 1 | 0 | 0 | 0.041 |
| SVOC | Phenanthrene | WG | N | 38 | ug/l | <0.65 | <0.71 | n.d. | n.d. | n.d. | n.d. | n.d. | 0 | 0 | - | - | - | - | - | - | - | - | - | - | - | - |
| SVOC | Phenol | WG | N | 38 | ug/l | <0.41 | <0.45 | n.d. | n.d. | n.d. | n.d. | n.d. | 0 | 0 | - | - | - | 0 | 0 | 300 | - | - | - | 0 | 0 | 580 |
| SVOC | Pyrene | WG | N | 38 | ug/l | <0.83 | <0.9 | n.d. | n.d. | n.d. | n.d. | n.d. | 0 | 0 | - | - | - | 0 | 0 | 830 | - | - | - | 0 | 0 | 12 |
| VOC | 1,1,1-Trichloroethane | WG | N | 38 | ug/l | <0.28 | 3.8 | n.d. | n.d. | n.d. | n.d. | n.d. | 1 | 3 | - | - | - | 0 | 0 | 200 | 0 | 0 | 200 | 0 | 0 | 800 |
| VOC | 1,1,2,2-Tetrachloroethane | WG | N | 38 | ug/l | <0.19 | <0.19 | n.d. | n.d. | n.d. | n.d. | n.d. | 0 | 0 | - | - | - | 0 | 0 | 2 | - | - | - | - | - | - |
| VOC | 1,1,2-Trichloro-1,2,2-trifluoroethane | WG | N | 38 | ug/l | <0.34 | <0.34 | n.d. | n.d. | n.d. | n.d. | n.d. | 0 | 0 | - | - | - | - | - | - | - | - | - | 0 | 0 | 5500 |
| VOC | 1,1,2-Trichloroethane | WG | N | 38 | ug/l | <0.08 | <0.08 | n.d. | n.d. | n.d. | n.d. | n.d. | 0 | 0 | - | - | - | 0 | 0 | 3 | - | - | - | - | - | - |
| VOC | 1,1-Dichloroethane | WG | N | 38 | ug/l | <0.24 | 0.71 | n.d. | n.d. | n.d. | n.d. | n.d. | 1 | 3 | - | - | - | 0 | 0 | 4 | - | - | - | 0 | 0 | 2.8 |
| VOC | 1,1-Dichloroethene | WG | N | 38 | ug/l | <0.34 | <0.34 | n.d. | n.d. | n.d. | n.d. | n.d. | 0 | 0 | - | - | - | 0 | 0 | 7 | - | - | - | - | - | - |
| VOC | 1,2,3-Trichlorobenzene | WG | N | 38 | ug/l | <0.35 | <0.35 | n.d. | n.d. | n.d. | n.d. | n.d. | 0 | 0 | - | - | - | 0 | 0 | 0.7 | - | - | - | 0 | 0 | 0.7 |
| VOC | 1,2,4-Trichlorobenzene | WG | N | 38 | ug/l | <0.27 | <0.27 | n.d. | n.d. | n.d. | n.d. | n.d. | 0 | 0 | - | - | - | 0 | 0 | 70 | - | - | - | 0 | 0 | 0.4 |
| VOC | 1,2-Dibromo-3-Chloropropane | WG | N | 38 | ug/l | <0.23 | <0.23 | n.d. | n.d. | n.d. | n.d. | n.d. | 0 | 0 | - | - | - | 0 | 0 | 0.2 | 0 | 0 | 0.2 | 0 | 0 | 0.00033 |
| VOC | 1,2-Dichlorobenzene | WG | N | 38 | ug/l | <0.22 | <0.22 | n.d. | n.d. | n.d. | n.d. | n.d. | 0 | 0 | - | - | - | 0 | 0 | 600 | 0 | 0 | 600 | 0 | 0 | 30 |
| VOC | 1,2-Dichloroethane | WG | N | 38 | ug/l | <0.25 | <0.25 | n.d. | n.d. | n.d. | n.d. | n.d. | 0 | 0 | - | - | - | 0 | 0 | 4 | 0 | 0 | 5 | 0 | 0 | 0.17 |
| VOC | 1,2-Dichloropropane | WG | N | 38 | ug/l | <0.18 | <0.18 | n.d. | n.d. | n.d. | n.d. | n.d. | 0 | 0 | - | - | - | 0 | 0 | 5 | 0 | 0 | 5 | 0 | 0 | 0.44 |

**Table 21. Groundwater in Monitoring Wells Screened in Upper Hydrogeologic Unit Analytical Results Statistical Summary, Columbia Falls Aluminum Company, LLC, Phase I Site Characterization, 2000 Aluminum Drive, Columbia Falls, MT**

| | | | | | | | | | | | | | | | CFMW-001 STANDARD | | | DEQ 7 Human Health Standards | | | EPA Drinking MCL | | | EPA Tapwater RSL | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Group | Analyte | Matrix | Fraction | No. of Results | Unit | Min | Max | Mean | Median | Standard Deviation | 5th Percentile | 95th Percentile | # > LOD | % > LOD | No. Exceeding | % Exceeding | Action Level | No. Exceeding | % Exceeding | Action Level | No. Exceeding | % Exceeding | Action Level | No. Exceeding | % Exceeding | Action Level |
| VOC | 1,3-Dichlorobenzene | WG | N | 38 | ug/l | <0.33 | <0.33 | n.d. | n.d. | n.d. | n.d. | n.d. | 0 | 0 | - | - | - | 0 | 0 | 600 | - | - | - | - | - | - |
| VOC | 1,4-Dichlorobenzene | WG | N | 38 | ug/l | <0.33 | <0.33 | n.d. | n.d. | n.d. | n.d. | n.d. | 0 | 0 | - | - | - | 0 | 0 | 75 | 0 | 0 | 75 | 0 | 0 | 0.48 |
| VOC | 2-Butanone (MEK) | WG | N | 38 | ug/l | <2.2 | <2.2 | n.d. | n.d. | n.d. | n.d. | n.d. | 0 | 0 | - | - | - | - | - | - | - | - | - | 0 | 0 | 560 |
| VOC | 2-Hexanone | WG | N | 38 | ug/l | <0.72 | <0.72 | n.d. | n.d. | n.d. | n.d. | n.d. | 0 | 0 | - | - | - | - | - | - | - | - | - | 0 | 0 | 3.8 |
| VOC | 4-Methyl-2-pentanone (MIBK) | WG | N | 38 | ug/l | <0.63 | <0.63 | n.d. | n.d. | n.d. | n.d. | n.d. | 0 | 0 | - | - | - | - | - | - | - | - | - | 0 | 0 | 630 |
| VOC | Acetone | WG | N | 38 | ug/l | <1.1 | 10 | n.d. | n.d. | n.d. | n.d. | 9.92 | 2 | 5 | - | - | - | - | - | - | - | - | - | 0 | 0 | 1400 |
| VOC | Benzene | WG | N | 38 | ug/l | <0.09 | <0.09 | n.d. | n.d. | n.d. | n.d. | n.d. | 0 | 0 | - | - | - | 0 | 0 | 5 | 0 | 0 | 5 | 0 | 0 | 0.46 |
| VOC | Bromoform | WG | N | 38 | ug/l | <0.18 | <0.18 | n.d. | n.d. | n.d. | n.d. | n.d. | 0 | 0 | - | - | - | 0 | 0 | 80 | 0 | 0 | 80 | 0 | 0 | 3.3 |
| VOC | Bromomethane | WG | N | 38 | ug/l | <0.18 | <0.18 | n.d. | n.d. | n.d. | n.d. | n.d. | 0 | 0 | - | - | - | 0 | 0 | 10 | - | - | - | 0 | 0 | 0.75 |
| VOC | Carbon disulfide | WG | N | 38 | ug/l | <0.22 | 3 | n.d. | n.d. | n.d. | n.d. | n.d. | 1 | 3 | - | - | - | - | - | - | - | - | - | 0 | 0 | 81 |
| VOC | Carbon tetrachloride | WG | N | 38 | ug/l | <0.33 | <0.33 | n.d. | n.d. | n.d. | n.d. | n.d. | 0 | 0 | - | - | - | 0 | 0 | 3 | 0 | 0 | 5 | 0 | 0 | 0.46 |
| VOC | Chlorobenzene | WG | N | 38 | ug/l | <0.24 | <0.24 | n.d. | n.d. | n.d. | n.d. | n.d. | 0 | 0 | - | - | - | 0 | 0 | 100 | 0 | 0 | 100 | 0 | 0 | 7.8 |
| VOC | Chlorobromomethane | WG | N | 38 | ug/l | <0.3 | <0.3 | n.d. | n.d. | n.d. | n.d. | n.d. | 0 | 0 | - | - | - | - | - | - | - | - | - | 0 | 0 | 8.3 |
| VOC | Chlorodibromomethane | WG | N | 38 | ug/l | <0.22 | <0.22 | n.d. | n.d. | n.d. | n.d. | n.d. | 0 | 0 | - | - | - | 0 | 0 | 4 | 0 | 0 | 80 | 0 | 0 | 0.87 |
| VOC | Chloroethane | WG | N | 38 | ug/l | <0.37 | <0.37 | n.d. | n.d. | n.d. | n.d. | n.d. | 0 | 0 | - | - | - | - | - | - | - | - | - | 0 | 0 | 2100 |
| VOC | Chloroform | WG | N | 38 | ug/l | <0.22 | <0.22 | n.d. | n.d. | n.d. | n.d. | n.d. | 0 | 0 | - | - | - | 0 | 0 | 70 | 0 | 0 | 80 | 0 | 0 | 0.22 |
| VOC | Chloromethane | WG | N | 38 | ug/l | <0.22 | <0.22 | n.d. | n.d. | n.d. | n.d. | n.d. | 0 | 0 | - | - | - | 0 | 0 | 30 | - | - | - | 0 | 0 | 19 |
| VOC | cis-1,2-Dichloroethene | WG | N | 38 | ug/l | <0.26 | <0.26 | n.d. | n.d. | n.d. | n.d. | n.d. | 0 | 0 | - | - | - | 0 | 0 | 70 | - | - | - | - | - | - |
| VOC | cis-1,3-Dichloropropene | WG | N | 38 | ug/l | <0.16 | <0.16 | n.d. | n.d. | n.d. | n.d. | n.d. | 0 | 0 | - | - | - | 0 | 0 | 4 | - | - | - | - | - | - |
| VOC | Cyclohexane | WG | N | 38 | ug/l | <0.26 | <0.26 | n.d. | n.d. | n.d. | n.d. | n.d. | 0 | 0 | - | - | - | - | - | - | - | - | - | 0 | 0 | 1300 |
| VOC | Dichlorobromomethane | WG | N | 38 | ug/l | <0.15 | <0.15 | n.d. | n.d. | n.d. | n.d. | n.d. | 0 | 0 | - | - | - | 0 | 0 | 10 | 0 | 0 | 80 | 0 | 0 | 0.13 |
| VOC | Dichlorodifluoromethane | WG | N | 38 | ug/l | <0.14 | <0.14 | n.d. | n.d. | n.d. | n.d. | n.d. | 0 | 0 | - | - | - | 0 | 0 | 1000 | - | - | - | 0 | 0 | 20 |
| VOC | Ethylbenzene | WG | N | 38 | ug/l | <0.3 | <0.3 | n.d. | n.d. | n.d. | n.d. | n.d. | 0 | 0 | - | - | - | 0 | 0 | 700 | 0 | 0 | 700 | 0 | 0 | 1.5 |
| VOC | Ethylene Dibromide | WG | N | 38 | ug/l | <0.19 | <0.19 | n.d. | n.d. | n.d. | n.d. | n.d. | 0 | 0 | - | - | - | 0 | 0 | 0.004 | - | - | - | - | - | - |
| VOC | Isopropylbenzene | WG | N | 38 | ug/l | <0.32 | <0.32 | n.d. | n.d. | n.d. | n.d. | n.d. | 0 | 0 | - | - | - | - | - | - | - | - | - | - | - | - |
| VOC | Methyl acetate | WG | N | 38 | ug/l | <0.58 | <0.58 | n.d. | n.d. | n.d. | n.d. | n.d. | 0 | 0 | - | - | - | - | - | - | - | - | - | 0 | 0 | 2000 |
| VOC | Methyl tert-butyl ether | WG | N | 38 | ug/l | <0.13 | <0.13 | n.d. | n.d. | n.d. | n.d. | n.d. | 0 | 0 | - | - | - | 0 | 0 | 30 | - | - | - | 0 | 0 | 14 |
| VOC | Methylcyclohexane | WG | N | 38 | ug/l | <0.22 | <0.22 | n.d. | n.d. | n.d. | n.d. | n.d. | 0 | 0 | - | - | - | - | - | - | - | - | - | - | - | - |
| VOC | Methylene Chloride | WG | N | 38 | ug/l | <0.21 | <0.21 | n.d. | n.d. | n.d. | n.d. | n.d. | 0 | 0 | - | - | - | 0 | 0 | 5 | 0 | 0 | 5 | 0 | 0 | 11 |
| VOC | m-Xylene & p-Xylene | WG | N | 38 | ug/l | <0.28 | <0.28 | n.d. | n.d. | n.d. | n.d. | n.d. | 0 | 0 | - | - | - | - | - | - | - | - | - | - | - | - |
| VOC | o-Xylene | WG | N | 38 | ug/l | <0.32 | <0.32 | n.d. | n.d. | n.d. | n.d. | n.d. | 0 | 0 | - | - | - | 0 | 0 | 10000 | - | - | - | 0 | 0 | 19 |
| VOC | Styrene | WG | N | 38 | ug/l | <0.17 | <0.17 | n.d. | n.d. | n.d. | n.d. | n.d. | 0 | 0 | - | - | - | 0 | 0 | 100 | 0 | 0 | 100 | 0 | 0 | 120 |
| VOC | Tetrachloroethene | WG | N | 38 | ug/l | <0.12 | 0.56 | 0.04 | n.d. | 0.12 | n.d. | 0.52 | 6 | 16 | - | - | - | 0 | 0 | 5 | - | - | - | - | - | - |
| VOC | Toluene | WG | N | 38 | ug/l | <0.25 | 2.2 | n.d. | n.d. | n.d. | n.d. | n.d. | 1 | 3 | - | - | - | 0 | 0 | 1000 | 0 | 0 | 1000 | 0 | 0 | 110 |
| VOC | trans-1,2-Dichloroethene | WG | N | 38 | ug/l | <0.18 | <0.18 | n.d. | n.d. | n.d. | n.d. | n.d. | 0 | 0 | - | - | - | 0 | 0 | 100 | - | - | - | - | - | - |
| VOC | trans-1,3-Dichloropropene | WG | N | 38 | ug/l | <0.19 | <0.19 | n.d. | n.d. | n.d. | n.d. | n.d. | 0 | 0 | - | - | - | 0 | 0 | 2 | - | - | - | - | - | - |
| VOC | Trichloroethene | WG | N | 38 | ug/l | <0.22 | 0.76 | n.d. | n.d. | n.d. | n.d. | n.d. | 1 | 3 | - | - | - | 0 | 0 | 5 | - | - | - | - | - | - |

**Table 21. Groundwater in Monitoring Wells Screened in Upper Hydrogeologic Unit Analytical Results Statistical Summary, Columbia Falls Aluminum Company, LLC, Phase I Site Characterization, 2000 Aluminum Drive, Columbia Falls, MT**

| | | | | | | | | | | | | | | | CFMW-001 STANDARD | | | DEQ 7 Human Health Standards | | | EPA Drinking MCL | | | EPA Tapwater RSL | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Group | Analyte | Matrix | Fraction | No. of Results | Unit | Min | Max | Mean | Median | Standard Deviation | 5th Percentile | 95th Percentile | # > LOD | % > LOD | No. Exceeding | % Exceeding | Action Level | No. Exceeding | % Exceeding | Action Level | No. Exceeding | % Exceeding | Action Level | No. Exceeding | % Exceeding | Action Level |
| VOC | Trichlorofluoromethane | WG | N | 38 | ug/l | <0.15 | <0.15 | n.d. | n.d. | n.d. | n.d. | n.d. | 0 | 0 | - | - | - | 0 | 0 | 10000 | - | - | - | 0 | 0 | 520 |
| VOC | Vinyl chloride | WG | N | 38 | ug/l | <0.06 | <0.06 | n.d. | n.d. | n.d. | n.d. | n.d. | 0 | 0 | - | - | - | 0 | 0 | 0.2 | 0 | 0 | 2 | 0 | 0 | 0.019 |

µg/kg - Micrograms per Kilograms
n.d - Non Detect
LOD - Limit of Detection
DEQ 7 Human Health Standards - Department of Environmental Quality-7 Human Health Standards
EPA Drinking MCL - Environmental Protection Agency Risk Based Screening Level Drinking water MCL
EPA Tapwater RSL - Environmental Protection Agency Risk Based Screening Level Tapwater RSL
N - Non Applicable
D - Dissolved
T - Total

**Table 22. Groundwater in Monitoring Wells Screened Below Upper Hydrogeologic Unit Analytical Results Statistical Summary, Columbia Falls Aluminum Company, LLC, Phase I Site Characterization, 2000 Aluminum Drive, Columbia Falls, MT**

| | | | | | | | | | | | | | | | CFMW-001 STANDARD | | | DEQ 7 Human Health Standards | | | EPA Drinking MCL | | | EPA Tapwater RSL | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Group | Analyte | Matrix | Fraction | No. of Results | Unit | Min | Max | Mean | Median | Standard Deviation | 5th Percentile | 95th Percentile | # > LOD | % > LOD | No. Exceeding | % Exceeding | Action Level | No. Exceeding | % Exceeding | Action Level | No. Exceeding | % Exceeding | Action Level | No. Exceeding | % Exceeding | Action Level |
| GENCHEM | Ammonia | WG | T | 13 | ug/l | <72 | 6400 | 601.66 | 95.70 | 1748.11 | n.d. | 4335.00 | 8 | 62 | 8 | 62 | 72 | - | - | - | - | - | - | - | - | - |
| GENCHEM | Chloride | WG | N | 13 | ug/l | 459 | 17900 | 4584.62 | 3500.00 | 4730.00 | 526.20 | 12320.00 | 13 | 100 | 11 | 85 | 611 | - | - | - | - | - | - | - | - | - |
| GENCHEM | Fluoride | WG | N | 13 | ug/l | <15 | 405 | 175.78 | 147.00 | 148.06 | n.d. | 402.00 | 11 | 85 | 8 | 62 | 91.7 | 0 | 0 | 4000 | 0 | 0 | 4000 | 8 | 62 | 80 |
| GENCHEM | Hardness as calcium carbonate | WG | T | 13 | ug/l | 102000 | 2220000 | 617230.77 | 194000.00 | 769927.94 | 105600.00 | 1968000.00 | 13 | 100 | 4 | 31 | 206000 | - | - | - | - | - | - | - | - | - |
| GENCHEM | Nitrate Nitrite as N | WG | T | 13 | ug/l | <100 | <100 | n.d. | n.d. | n.d. | n.d. | n.d. | 0 | 0 | 0 | 0 | 100 | 0 | 0 | 10000 | 0 | 0 | 10000 | - | - | - |
| GENCHEM | Orthophosphate as P | WG | N | 7 | ug/l | <42 | <42 | n.d. | n.d. | n.d. | n.d. | n.d. | 0 | 0 | 0.00 | 0 | 42 | - | - | - | - | - | - | - | - | - |
| GENCHEM | Sulfate | WG | N | 13 | ug/l | 797 | 96400 | 15591.00 | 5260.00 | 26200.60 | 814.40 | 60580.00 | 13 | 100 | 6 | 46 | 6600 | - | - | - | - | - | - | - | - | - |
| METALS | Aluminum | WG | D | 13 | ug/l | <18.2 | 168 | 50.09 | 33.80 | 56.19 | n.d. | 157.15 | 8 | 62 | 8 | 62 | 18.2 | - | - | - | - | - | - | 0 | 0 | 2000 |
| METALS | Antimony | WG | D | 13 | ug/l | <0.62 | 0.87 | 0.11 | n.d. | 0.28 | n.d. | 0.87 | 2 | 15 | 1 | 8 | 0.62 | 0 | 0 | 6 | 0 | 0 | 6 | 1 | 8 | 0.78 |
| METALS | Arsenic | WG | D | 13 | ug/l | <0.64 | 8.3 | 1.53 | n.d. | 2.61 | n.d. | 7.68 | 5 | 38 | 5 | 38 | 0.64 | 0 | 0 | 10 | 0 | 0 | 10 | 5 | 38 | 0.052 |
| METALS | Barium | WG | D | 13 | ug/l | 42.7 | 4430 | 555.55 | 87.40 | 1204.04 | 44.86 | 2326.40 | 13 | 100 | 4 | 31 | 228 | 1 | 8 | 1000 | 1 | 8 | 2000 | 3 | 23 | 380 |
| METALS | Beryllium | WG | D | 13 | ug/l | <0.24 | <0.24 | n.d. | n.d. | n.d. | n.d. | n.d. | 0 | 0 | 0.00 | 0 | 0.24 | 0 | 0 | 4 | 0 | 0 | 4 | 0 | 0 | 2.5 |
| METALS | Cadmium | WG | D | 13 | ug/l | <0.71 | <0.71 | n.d. | n.d. | n.d. | n.d. | n.d. | 0 | 0 | 0.00 | 0 | 0.71 | 0 | 0 | 5 | - | - | - | - | - | - |
| METALS | Calcium | WG | D | 13 | ug/l | 13700 | 922000 | 210215.38 | 38300.00 | 307187.61 | 14540.00 | 745600.00 | 13 | 100 | 4 | 31 | 60300 | - | - | - | - | - | - | - | - | - |
| METALS | Chromium | WG | D | 13 | ug/l | <1.3 | 16 | 2.45 | n.d. | 5.16 | n.d. | 15.54 | 4 | 31 | 3 | 23 | 1.3 | 0 | 0 | 100 | 0 | 0 | 100 | - | - | - |
| METALS | Cobalt | WG | D | 13 | ug/l | <1.3 | <1.3 | n.d. | n.d. | n.d. | n.d. | n.d. | 0 | 0 | 0 | 0 | 1.3 | - | - | - | - | - | - | 0 | 0 | 0.6 |
| METALS | Copper | WG | D | 13 | ug/l | <1.4 | 7.1 | 1.56 | n.d. | 2.16 | n.d. | 6.25 | 6 | 46 | 2 | 15 | 3.2 | 0 | 0 | 1300 | 0 | 0 | 1300 | 0 | 0 | 80 |
| METALS | Cyanide, Total | WG | T | 13 | ug/l | <2 | 5.9 | 0.62 | n.d. | 1.69 | n.d. | 5.71 | 2 | 15 | 1 | 8 | 2.4 | 0 | 0 | 200 | 0 | 0 | 200 | 2 | 15 | 0.15 |
| METALS | Iron | WG | D | 13 | ug/l | <42.4 | 2290 | 285.54 | n.d. | 646.56 | n.d. | 2056.30 | 4 | 31 | 4 | 31 | 42.4 | - | - | - | - | - | - | 1 | 8 | 1400 |
| METALS | Lead | WG | D | 13 | ug/l | <0.38 | 1.3 | 0.23 | n.d. | 0.40 | n.d. | 1.20 | 4 | 31 | 4 | 31 | 0.38 | 0 | 0 | 15 | 0 | 0 | 15 | 0 | 0 | 15 |
| METALS | Magnesium | WG | D | 13 | ug/l | <63.6 | 24100 | 8727.69 | 7470.00 | 8187.80 | n.d. | 21940.00 | 9 | 69 | 4 | 31 | 14100 | - | - | - | - | - | - | - | - | - |
| METALS | Manganese | WG | D | 13 | ug/l | <2.5 | 297 | 50.75 | 21.60 | 80.15 | n.d. | 212.68 | 9 | 69 | 9 | 69 | 2.5 | - | - | - | - | - | - | - | - | - |
| METALS | Mercury | WG | D | 13 | ug/l | <0.17 | <0.17 | n.d. | n.d. | n.d. | n.d. | n.d. | 0 | 0 | 0.00 | 0 | 0.17 | 0 | 0 | 2 | 0 | 0 | 2 | 0 | 0 | 0.063 |
| METALS | Nickel | WG | D | 13 | ug/l | <1.4 | <1.4 | n.d. | n.d. | n.d. | n.d. | n.d. | 0 | 0 | 0 | 0 | 1.4 | 0 | 0 | 100 | - | - | - | - | - | - |
| METALS | Potassium | WG | D | 13 | ug/l | 721 | 65200 | 11267.00 | 3270.00 | 17523.36 | 1230.40 | 39040.00 | 13 | 100 | 12 | 92 | 740 | - | - | - | - | - | - | - | - | - |
| METALS | Selenium | WG | D | 13 | ug/l | <0.73 | <0.73 | n.d. | n.d. | n.d. | n.d. | n.d. | 0 | 0 | 0 | 0 | 0.73 | 0 | 0 | 50 | 0 | 0 | 50 | 0 | 0 | 10 |
| METALS | Silver | WG | D | 13 | ug/l | <1.3 | <1.3 | n.d. | n.d. | n.d. | n.d. | n.d. | 0 | 0 | 0.00 | 0 | 1.3 | 0 | 0 | 100 | - | - | - | 0 | 0 | 9.4 |
| METALS | Sodium | WG | D | 13 | ug/l | 3700 | 102000 | 25602.31 | 17500.00 | 27763.00 | 3820.00 | 71340.00 | 13 | 100 | 9 | 69 | 8360 | - | - | - | - | - | - | - | - | - |
| METALS | Thallium | WG | D | 13 | ug/l | <0.26 | <0.26 | n.d. | n.d. | n.d. | n.d. | n.d. | 0 | 0 | 0.00 | 0 | 0.26 | 0 | 0 | 2 | 0 | 0 | 2 | 0 | 0 | 0.02 |
| METALS | Vanadium | WG | D | 13 | ug/l | <1.9 | 5.4 | 0.92 | n.d. | 1.82 | n.d. | 5.23 | 3 | 23 | 3 | 23 | 1.9 | - | - | - | - | - | - | 0 | 0 | 8.6 |
| METALS | Zinc | WG | D | 13 | ug/l | <7 | <7 | n.d. | n.d. | n.d. | n.d. | n.d. | 0 | 0 | 0 | 0 | 7 | 0 | 0 | 2000 | - | - | - | 0 | 0 | 600 |
| SVOC | 1,1'-Biphenyl | WG | N | 1 | ug/l | <0.63 | <0.63 | n.d. | n.d. | n.d. | n.d. | n.d. | 0 | 0 | - | - | - | - | - | - | - | - | - | 0 | 0 | 0.083 |
| SVOC | 1,2,4,5-Tetrachlorobenzene | WG | N | 1 | ug/l | <0.43 | <0.43 | n.d. | n.d. | n.d. | n.d. | n.d. | 0 | 0 | - | - | - | 0 | 0 | 0.97 | - | - | - | 0 | 0 | 0.17 |
| SVOC | 1,4-Dioxane | WG | N | 1 | ug/l | <3.1 | <3.1 | n.d. | n.d. | n.d. | n.d. | n.d. | 0 | 0 | - | - | - | - | - | - | - | - | - | 0 | 0 | 0.46 |
| SVOC | 2,2'-oxybis[1-chloropropane] | WG | N | 1 | ug/l | <0.93 | <0.93 | n.d. | n.d. | n.d. | n.d. | n.d. | 0 | 0 | - | - | - | 0 | 0 | 1400 | - | - | - | - | - | - |
| SVOC | 2,3,4,6-Tetrachlorophenol | WG | N | 1 | ug/l | <0.69 | <0.69 | n.d. | n.d. | n.d. | n.d. | n.d. | 0 | 0 | - | - | - | - | - | - | - | - | - | 0 | 0 | 24 |

**Table 22. Groundwater in Monitoring Wells Screened Below Upper Hydrogeologic Unit Analytical Results Statistical Summary, Columbia Falls Aluminum Company, LLC, Phase I Site Characterization, 2000 Aluminum Drive, Columbia Falls, MT**



| | | | | | | | | | | | | | | | CFMW-001 STANDARD | | | DEQ 7 Human Health Standards | | | EPA Drinking MCL | | | EPA Tapwater RSL | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Group | Analyte | Matrix | Fraction | No. of Results | Unit | Min | Max | Mean | Median | Standard Deviation | 5th Percentile | 95th Percentile | # > LOD | % > LOD | No. Exceeding | % Exceeding | Action Level | No. Exceeding | % Exceeding | Action Level | No. Exceeding | % Exceeding | Action Level | No. Exceeding | % Exceeding | Action Level |
| SVOC | 2,4,5-Trichlorophenol | WG | N | 1 | ug/l | <0.49 | <0.49 | n.d. | n.d. | n.d. | n.d. | n.d. | 0 | 0 | - | - | - | 0 | 0 | 1800 | - | - | - | 0 | 0 | 120 |
| SVOC | 2,4,6-Trichlorophenol | WG | N | 1 | ug/l | <0.53 | <0.53 | n.d. | n.d. | n.d. | n.d. | n.d. | 0 | 0 | - | - | - | 0 | 0 | 30 | - | - | - | 0 | 0 | 1.2 |
| SVOC | 2,4-Dichlorophenol | WG | N | 1 | ug/l | <0.63 | <0.63 | n.d. | n.d. | n.d. | n.d. | n.d. | 0 | 0 | - | - | - | 0 | 0 | 77 | - | - | - | 0 | 0 | 4.6 |
| SVOC | 2,4-Dimethylphenol | WG | N | 1 | ug/l | <0.91 | <0.91 | n.d. | n.d. | n.d. | n.d. | n.d. | 0 | 0 | - | - | - | 0 | 0 | 380 | - | - | - | 0 | 0 | 36 |
| SVOC | 2,4-Dinitrophenol | WG | N | 1 | ug/l | <2.4 | <2.4 | n.d. | n.d. | n.d. | n.d. | n.d. | 0 | 0 | - | - | - | 0 | 0 | 69 | - | - | - | 0 | 0 | 3.9 |
| SVOC | 2,4-Dinitrotoluene | WG | N | 1 | ug/l | <1 | <1 | n.d. | n.d. | n.d. | n.d. | n.d. | 0 | 0 | - | - | - | 0 | 0 | 1.1 | - | - | - | 0 | 0 | 0.24 |
| SVOC | 2,6-Dinitrotoluene | WG | N | 1 | ug/l | <0.88 | <0.88 | n.d. | n.d. | n.d. | n.d. | n.d. | 0 | 0 | - | - | - | 0 | 0 | 0.5 | - | - | - | 0 | 0 | 0.049 |
| SVOC | 2-Chloronaphthalene | WG | N | 1 | ug/l | <0.61 | <0.61 | n.d. | n.d. | n.d. | n.d. | n.d. | 0 | 0 | - | - | - | 0 | 0 | 1000 | - | - | - | - | - | - |
| SVOC | 2-Chlorophenol | WG | N | 1 | ug/l | <0.74 | <0.74 | n.d. | n.d. | n.d. | n.d. | n.d. | 0 | 0 | - | - | - | 0 | 0 | 81 | - | - | - | 0 | 0 | 9.1 |
| SVOC | 2-Methylnaphthalene | WG | N | 1 | ug/l | <0.88 | <0.88 | n.d. | n.d. | n.d. | n.d. | n.d. | 0 | 0 | - | - | - | - | - | - | - | - | - | 0 | 0 | 3.6 |
| SVOC | 2-Methylphenol | WG | N | 1 | ug/l | <1.3 | <1.3 | n.d. | n.d. | n.d. | n.d. | n.d. | 0 | 0 | - | - | - | - | - | - | - | - | - | - | - | - |
| SVOC | 2-Nitroaniline | WG | N | 1 | ug/l | <0.65 | <0.65 | n.d. | n.d. | n.d. | n.d. | n.d. | 0 | 0 | - | - | - | - | - | - | - | - | - | 0 | 0 | 19 |
| SVOC | 2-Nitrophenol | WG | N | 1 | ug/l | <0.59 | <0.59 | n.d. | n.d. | n.d. | n.d. | n.d. | 0 | 0 | - | - | - | - | - | - | - | - | - | - | - | - |
| SVOC | 3 & 4 Methylphenol | WG | N | 1 | ug/l | <0.88 | <0.88 | n.d. | n.d. | n.d. | n.d. | n.d. | 0 | 0 | - | - | - | - | - | - | - | - | - | - | - | - |
| SVOC | 3,3'-Dichlorobenzidine | WG | N | 1 | ug/l | <1 | <1 | n.d. | n.d. | n.d. | n.d. | n.d. | 0 | 0 | - | - | - | 0 | 0 | 0.21 | - | - | - | 0 | 0 | 0.13 |
| SVOC | 3-Nitroaniline | WG | N | 1 | ug/l | <0.82 | <0.82 | n.d. | n.d. | n.d. | n.d. | n.d. | 0 | 0 | - | - | - | - | - | - | - | - | - | - | - | - |
| SVOC | 4,6-Dinitro-2-methylphenol | WG | N | 1 | ug/l | <2 | <2 | n.d. | n.d. | n.d. | n.d. | n.d. | 0 | 0 | - | - | - | 0 | 0 | 13 | - | - | - | - | - | - |
| SVOC | 4-Bromophenyl phenyl ether | WG | N | 1 | ug/l | <1 | <1 | n.d. | n.d. | n.d. | n.d. | n.d. | 0 | 0 | - | - | - | - | - | - | - | - | - | - | - | - |
| SVOC | 4-Chloro-3-methylphenol | WG | N | 1 | ug/l | <0.76 | <0.76 | n.d. | n.d. | n.d. | n.d. | n.d. | 0 | 0 | - | - | - | 0 | 0 | 3000 | - | - | - | - | - | - |
| SVOC | 4-Chloroaniline | WG | N | 1 | ug/l | <0.73 | <0.73 | n.d. | n.d. | n.d. | n.d. | n.d. | 0 | 0 | - | - | - | - | - | - | - | - | - | 0 | 0 | 0.37 |
| SVOC | 4-Chlorophenyl phenyl ether | WG | N | 1 | ug/l | <0.96 | <0.96 | n.d. | n.d. | n.d. | n.d. | n.d. | 0 | 0 | - | - | - | - | - | - | - | - | - | - | - | - |
| SVOC | 4-Nitroaniline | WG | N | 1 | ug/l | <0.48 | <0.48 | n.d. | n.d. | n.d. | n.d. | n.d. | 0 | 0 | - | - | - | - | - | - | - | - | - | 0 | 0 | 3.8 |
| SVOC | 4-Nitrophenol | WG | N | 1 | ug/l | <4.7 | <4.7 | n.d. | n.d. | n.d. | n.d. | n.d. | 0 | 0 | - | - | - | 0 | 0 | 60 | - | - | - | - | - | - |
| SVOC | Acenaphthene | WG | N | 1 | ug/l | <0.88 | <0.88 | n.d. | n.d. | n.d. | n.d. | n.d. | 0 | 0 | - | - | - | 0 | 0 | 670 | - | - | - | 0 | 0 | 53 |
| SVOC | Acenaphthylene | WG | N | 1 | ug/l | <0.65 | <0.65 | n.d. | n.d. | n.d. | n.d. | n.d. | 0 | 0 | - | - | - | - | - | - | - | - | - | - | - | - |
| SVOC | Acetophenone | WG | N | 1 | ug/l | <1 | <1 | n.d. | n.d. | n.d. | n.d. | n.d. | 0 | 0 | - | - | - | - | - | - | - | - | - | 0 | 0 | 190 |
| SVOC | Anthracene | WG | N | 1 | ug/l | <0.57 | <0.57 | n.d. | n.d. | n.d. | n.d. | n.d. | 0 | 0 | - | - | - | 0 | 0 | 2100 | - | - | - | 0 | 0 | 180 |
| SVOC | Atrazine | WG | N | 1 | ug/l | <0.77 | <0.77 | n.d. | n.d. | n.d. | n.d. | n.d. | 0 | 0 | - | - | - | 0 | 0 | 3 | 0 | 0 | 3 | 0 | 0 | 0.3 |
| SVOC | Benzaldehyde | WG | N | 1 | ug/l | <0.86 | <0.86 | n.d. | n.d. | n.d. | n.d. | n.d. | 0 | 0 | - | - | - | - | - | - | - | - | - | 0 | 0 | 190 |
| SVOC | Benzo[a]anthracene | WG | N | 1 | ug/l | <0.55 | <0.55 | n.d. | n.d. | n.d. | n.d. | n.d. | 0 | 0 | - | - | - | 0 | 0 | 0.5 | - | - | - | - | - | - |
| SVOC | Benzo[a]pyrene | WG | N | 1 | ug/l | <0.16 | <0.16 | n.d. | n.d. | n.d. | n.d. | n.d. | 0 | 0 | - | - | - | 0 | 0 | 0.05 | 0 | 0 | 0.2 | 0 | 0 | 0.0034 |
| SVOC | Benzo[b]fluoranthene | WG | N | 1 | ug/l | <0.44 | <0.44 | n.d. | n.d. | n.d. | n.d. | n.d. | 0 | 0 | - | - | - | 0 | 0 | 0.5 | - | - | - | 0 | 0 | 0.034 |
| SVOC | Benzo[g,h,i]perylene | WG | N | 1 | ug/l | <0.75 | <0.75 | n.d. | n.d. | n.d. | n.d. | n.d. | 0 | 0 | - | - | - | - | - | - | - | - | - | - | - | - |
| SVOC | Benzo[k]fluoranthene | WG | N | 1 | ug/l | <0.18 | <0.18 | n.d. | n.d. | n.d. | n.d. | n.d. | 0 | 0 | - | - | - | 0 | 0 | 5 | - | - | - | 0 | 0 | 0.34 |
| SVOC | Bis(2-chloroethoxy)methane | WG | N | 1 | ug/l | <0.69 | <0.69 | n.d. | n.d. | n.d. | n.d. | n.d. | 0 | 0 | - | - | - | - | - | - | - | - | - | 0 | 0 | 5.9 |
| SVOC | Bis(2-chloroethyl)ether | WG | N | 1 | ug/l | <0.12 | <0.12 | n.d. | n.d. | n.d. | n.d. | n.d. | 0 | 0 | - | - | - | 0 | 0 | 0.3 | - | - | - | 0 | 0 | 0.014 |

**Table 22. Groundwater in Monitoring Wells Screened Below Upper Hydrogeologic Unit Analytical Results Statistical Summary, Columbia Falls Aluminum Company, LLC, Phase I Site Characterization, 2000 Aluminum Drive, Columbia Falls, MT**

| | | | | | | | | | | | | | | | CFMW-001 STANDARD | | | DEQ 7 Human Health Standards | | | EPA Drinking MCL | | | EPA Tapwater RSL | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Group | Analyte | Matrix | Fraction | No. of Results | Unit | Min | Max | Mean | Median | Standard Deviation | 5th Percentile | 95th Percentile | # > LOD | % > LOD | No. Exceeding | % Exceeding | Action Level | No. Exceeding | % Exceeding | Action Level | No. Exceeding | % Exceeding | Action Level | No. Exceeding | % Exceeding | Action Level |
| SVOC | Bis(2-ethylhexyl) phthalate | WG | N | 1 | ug/l | <0.72 | <0.72 | n.d. | n.d. | n.d. | n.d. | n.d. | 0 | 0 | - | - | - | 0 | 0 | 6 | 0 | 0 | 6 | 0 | 0 | 5.6 |
| SVOC | Butyl benzyl phthalate | WG | N | 1 | ug/l | <0.6 | <0.6 | n.d. | n.d. | n.d. | n.d. | n.d. | 0 | 0 | - | - | - | 0 | 0 | 1500 | - | - | - | 0 | 0 | 16 |
| SVOC | Caprolactam | WG | N | 1 | ug/l | <1.1 | <1.1 | n.d. | n.d. | n.d. | n.d. | n.d. | 0 | 0 | - | - | - | - | - | - | - | - | - | 0 | 0 | 990 |
| SVOC | Carbazole | WG | N | 1 | ug/l | <0.85 | <0.85 | n.d. | n.d. | n.d. | n.d. | n.d. | 0 | 0 | - | - | - | - | - | - | - | - | - | - | - | - |
| SVOC | Chrysene | WG | N | 1 | ug/l | <0.67 | <0.67 | n.d. | n.d. | n.d. | n.d. | n.d. | 0 | 0 | - | - | - | 0 | 0 | 50 | - | - | - | 0 | 0 | 3.4 |
| SVOC | Dibenz(a,h)anthracene | WG | N | 1 | ug/l | <0.09 | <0.09 | n.d. | n.d. | n.d. | n.d. | n.d. | 0 | 0 | - | - | - | 0 | 0 | 0.05 | - | - | - | 0 | 0 | 0.0034 |
| SVOC | Dibenzofuran | WG | N | 1 | ug/l | <0.85 | <0.85 | n.d. | n.d. | n.d. | n.d. | n.d. | 0 | 0 | - | - | - | - | - | - | - | - | - | 0 | 0 | 0.79 |
| SVOC | Diethyl phthalate | WG | N | 1 | ug/l | <1 | <1 | n.d. | n.d. | n.d. | n.d. | n.d. | 0 | 0 | - | - | - | 0 | 0 | 17000 | - | - | - | - | - | - |
| SVOC | Dimethyl phthalate | WG | N | 1 | ug/l | <0.98 | <0.98 | n.d. | n.d. | n.d. | n.d. | n.d. | 0 | 0 | - | - | - | 0 | 0 | 270000 | - | - | - | - | - | - |
| SVOC | Di-n-butyl phthalate | WG | N | 1 | ug/l | <0.82 | <0.82 | n.d. | n.d. | n.d. | n.d. | n.d. | 0 | 0 | - | - | - | 0 | 0 | 2000 | - | - | - | - | - | - |
| SVOC | Di-n-octyl phthalate | WG | N | 1 | ug/l | <0.69 | <0.69 | n.d. | n.d. | n.d. | n.d. | n.d. | 0 | 0 | - | - | - | - | - | - | - | - | - | 0 | 0 | 20 |
| SVOC | Fluoranthene | WG | N | 1 | ug/l | <0.72 | <0.72 | n.d. | n.d. | n.d. | n.d. | n.d. | 0 | 0 | - | - | - | 0 | 0 | 130 | - | - | - | 0 | 0 | 80 |
| SVOC | Fluorene | WG | N | 1 | ug/l | <0.8 | <0.8 | n.d. | n.d. | n.d. | n.d. | n.d. | 0 | 0 | - | - | - | 0 | 0 | 1100 | - | - | - | 0 | 0 | 29 |
| SVOC | Hexachlorobenzene | WG | N | 1 | ug/l | <0.47 | <0.47 | n.d. | n.d. | n.d. | n.d. | n.d. | 0 | 0 | - | - | - | 0 | 0 | 0.2 | 0 | 0 | 1 | 0 | 0 | 0.0098 |
| SVOC | Hexachlorobutadiene | WG | N | 1 | ug/l | <0.76 | <0.76 | n.d. | n.d. | n.d. | n.d. | n.d. | 0 | 0 | - | - | - | 0 | 0 | 5 | - | - | - | 0 | 0 | 0.14 |
| SVOC | Hexachlorocyclopentadiene | WG | N | 1 | ug/l | <0.61 | <0.61 | n.d. | n.d. | n.d. | n.d. | n.d. | 0 | 0 | - | - | - | 0 | 0 | 50 | 0 | 0 | 50 | 0 | 0 | 0.041 |
| SVOC | Hexachloroethane | WG | N | 1 | ug/l | <0.09 | <0.09 | n.d. | n.d. | n.d. | n.d. | n.d. | 0 | 0 | - | - | - | 0 | 0 | 30 | - | - | - | 0 | 0 | 0.33 |
| SVOC | Indeno[1,2,3-cd]pyrene | WG | N | 1 | ug/l | <0.21 | <0.21 | n.d. | n.d. | n.d. | n.d. | n.d. | 0 | 0 | - | - | - | 0 | 0 | 0.5 | - | - | - | 0 | 0 | 0.034 |
| SVOC | Isophorone | WG | N | 1 | ug/l | <0.67 | <0.67 | n.d. | n.d. | n.d. | n.d. | n.d. | 0 | 0 | - | - | - | 0 | 0 | 400 | - | - | - | 0 | 0 | 78 |
| SVOC | Naphthalene | WG | N | 1 | ug/l | <0.8 | <0.8 | n.d. | n.d. | n.d. | n.d. | n.d. | 0 | 0 | - | - | - | 0 | 0 | 100 | - | - | - | 0 | 0 | 0.17 |
| SVOC | Nitrobenzene | WG | N | 1 | ug/l | <0.49 | <0.49 | n.d. | n.d. | n.d. | n.d. | n.d. | 0 | 0 | - | - | - | 0 | 0 | 17 | - | - | - | 0 | 0 | 0.14 |
| SVOC | N-Nitrosodi-n-propylamine | WG | N | 1 | ug/l | <0.83 | <0.83 | n.d. | n.d. | n.d. | n.d. | n.d. | 0 | 0 | - | - | - | 0 | 0 | 0.5 | - | - | - | 0 | 0 | 0.011 |
| SVOC | N-Nitrosodiphenylamine | WG | N | 1 | ug/l | <0.74 | <0.74 | n.d. | n.d. | n.d. | n.d. | n.d. | 0 | 0 | - | - | - | 0 | 0 | 33 | - | - | - | 0 | 0 | 12 |
| SVOC | Pentachlorophenol | WG | N | 1 | ug/l | <2.2 | <2.2 | n.d. | n.d. | n.d. | n.d. | n.d. | 0 | 0 | - | - | - | 0 | 0 | 1 | 0 | 0 | 1 | 0 | 0 | 0.041 |
| SVOC | Phenanthrene | WG | N | 1 | ug/l | <0.65 | <0.65 | n.d. | n.d. | n.d. | n.d. | n.d. | 0 | 0 | - | - | - | - | - | - | - | - | - | - | - | - |
| SVOC | Phenol | WG | N | 1 | ug/l | <0.41 | <0.41 | n.d. | n.d. | n.d. | n.d. | n.d. | 0 | 0 | - | - | - | 0 | 0 | 300 | - | - | - | 0 | 0 | 580 |
| SVOC | Pyrene | WG | N | 1 | ug/l | <0.83 | <0.83 | n.d. | n.d. | n.d. | n.d. | n.d. | 0 | 0 | - | - | - | 0 | 0 | 830 | - | - | - | 0 | 0 | 12 |
| VOC | 1,1,1-Trichloroethane | WG | N | 1 | ug/l | <0.28 | <0.28 | n.d. | n.d. | n.d. | n.d. | n.d. | 0 | 0 | - | - | - | 0 | 0 | 200 | 0 | 0 | 200 | 0 | 0 | 800 |
| VOC | 1,1,2,2-Tetrachloroethane | WG | N | 1 | ug/l | <0.19 | <0.19 | n.d. | n.d. | n.d. | n.d. | n.d. | 0 | 0 | - | - | - | 0 | 0 | 2 | - | - | - | - | - | - |
| VOC | 1,1,2-Trichloro-1,2,2-trifluoroethane | WG | N | 1 | ug/l | <0.34 | <0.34 | n.d. | n.d. | n.d. | n.d. | n.d. | 0 | 0 | - | - | - | - | - | - | - | - | - | 0 | 0 | 5500 |
| VOC | 1,1,2-Trichloroethane | WG | N | 1 | ug/l | <0.08 | <0.08 | n.d. | n.d. | n.d. | n.d. | n.d. | 0 | 0 | - | - | - | 0 | 0 | 3 | - | - | - | - | - | - |
| VOC | 1,1-Dichloroethane | WG | N | 1 | ug/l | <0.24 | <0.24 | n.d. | n.d. | n.d. | n.d. | n.d. | 0 | 0 | - | - | - | 0 | 0 | 4 | - | - | - | 0 | 0 | 2.8 |
| VOC | 1,1-Dichloroethene | WG | N | 1 | ug/l | <0.34 | <0.34 | n.d. | n.d. | n.d. | n.d. | n.d. | 0 | 0 | - | - | - | 0 | 0 | 7 | - | - | - | - | - | - |
| VOC | 1,2,3-Trichlorobenzene | WG | N | 1 | ug/l | <0.35 | <0.35 | n.d. | n.d. | n.d. | n.d. | n.d. | 0 | 0 | - | - | - | 0 | 0 | 0.7 | - | - | - | 0 | 0 | 0.7 |
| VOC | 1,2,4-Trichlorobenzene | WG | N | 1 | ug/l | <0.27 | <0.27 | n.d. | n.d. | n.d. | n.d. | n.d. | 0 | 0 | - | - | - | 0 | 0 | 70 | - | - | - | 0 | 0 | 0.4 |
| VOC | 1,2-Dibromo-3-Chloropropane | WG | N | 1 | ug/l | <0.23 | <0.23 | n.d. | n.d. | n.d. | n.d. | n.d. | 0 | 0 | - | - | - | 0 | 0 | 0.2 | 0 | 0 | 0.2 | 0 | 0 | 0.00033 |

**Table 22. Groundwater in Monitoring Wells Screened Below Upper Hydrogeologic Unit Analytical Results Statistical Summary, Columbia Falls Aluminum Company, LLC, Phase I Site Characterization, 2000 Aluminum Drive, Columbia Falls, MT**

| | | | | | | | | | | | | | | | CFMW-001 STANDARD | | | DEQ 7 Human Health Standards | | | EPA Drinking MCL | | | EPA Tapwater RSL | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Group | Analyte | Matrix | Fraction | No. of Results | Unit | Min | Max | Mean | Median | Standard Deviation | 5th Percentile | 95th Percentile | # > LOD | % > LOD | No. Exceeding | % Exceeding | Action Level | No. Exceeding | % Exceeding | Action Level | No. Exceeding | % Exceeding | Action Level | No. Exceeding | % Exceeding | Action Level |
| VOC | 1,2-Dichlorobenzene | WG | N | 1 | ug/l | <0.22 | <0.22 | n.d. | n.d. | n.d. | n.d. | n.d. | 0 | 0 | - | - | - | 0 | 0 | 600 | 0 | 0 | 600 | 0 | 0 | 30 |
| VOC | 1,2-Dichloroethane | WG | N | 1 | ug/l | 0.28 | 0.28 | 0.28 | 0.28 | - | 0.28 | 0.28 | 1 | 100 | - | - | - | 0 | 0 | 4 | 0 | 0 | 5 | 1 | 100 | 0.17 |
| VOC | 1,2-Dichloropropane | WG | N | 1 | ug/l | <0.18 | <0.18 | n.d. | n.d. | n.d. | n.d. | n.d. | 0 | 0 | - | - | - | 0 | 0 | 5 | 0 | 0 | 5 | 0 | 0 | 0.44 |
| VOC | 1,3-Dichlorobenzene | WG | N | 1 | ug/l | <0.33 | <0.33 | n.d. | n.d. | n.d. | n.d. | n.d. | 0 | 0 | - | - | - | 0 | 0 | 600 | - | - | - | - | - | - |
| VOC | 1,4-Dichlorobenzene | WG | N | 1 | ug/l | <0.33 | <0.33 | n.d. | n.d. | n.d. | n.d. | n.d. | 0 | 0 | - | - | - | 0 | 0 | 75 | 0 | 0 | 75 | 0 | 0 | 0.48 |
| VOC | 2-Butanone (MEK) | WG | N | 1 | ug/l | <2.2 | <2.2 | n.d. | n.d. | n.d. | n.d. | n.d. | 0 | 0 | - | - | - | - | - | - | - | - | - | 0 | 0 | 560 |
| VOC | 2-Hexanone | WG | N | 1 | ug/l | <0.72 | <0.72 | n.d. | n.d. | n.d. | n.d. | n.d. | 0 | 0 | - | - | - | - | - | - | - | - | - | 0 | 0 | 3.8 |
| VOC | 4-Methyl-2-pentanone (MIBK) | WG | N | 1 | ug/l | <0.63 | <0.63 | n.d. | n.d. | n.d. | n.d. | n.d. | 0 | 0 | - | - | - | - | - | - | - | - | - | 0 | 0 | 630 |
| VOC | Acetone | WG | N | 1 | ug/l | <1.1 | <1.1 | n.d. | n.d. | n.d. | n.d. | n.d. | 0 | 0 | - | - | - | - | - | - | - | - | - | 0 | 0 | 1400 |
| VOC | Benzene | WG | N | 1 | ug/l | <0.09 | <0.09 | n.d. | n.d. | n.d. | n.d. | n.d. | 0 | 0 | - | - | - | 0 | 0 | 5 | 0 | 0 | 5 | 0 | 0 | 0.46 |
| VOC | Bromoform | WG | N | 1 | ug/l | <0.18 | <0.18 | n.d. | n.d. | n.d. | n.d. | n.d. | 0 | 0 | - | - | - | 0 | 0 | 80 | 0 | 0 | 80 | 0 | 0 | 3.3 |
| VOC | Bromomethane | WG | N | 1 | ug/l | <0.18 | <0.18 | n.d. | n.d. | n.d. | n.d. | n.d. | 0 | 0 | - | - | - | 0 | 0 | 10 | - | - | - | 0 | 0 | 0.75 |
| VOC | Carbon disulfide | WG | N | 1 | ug/l | <0.22 | <0.22 | n.d. | n.d. | n.d. | n.d. | n.d. | 0 | 0 | - | - | - | - | - | - | - | - | - | 0 | 0 | 81 |
| VOC | Carbon tetrachloride | WG | N | 1 | ug/l | <0.33 | <0.33 | n.d. | n.d. | n.d. | n.d. | n.d. | 0 | 0 | - | - | - | 0 | 0 | 3 | 0 | 0 | 5 | 0 | 0 | 0.46 |
| VOC | Chlorobenzene | WG | N | 1 | ug/l | <0.24 | <0.24 | n.d. | n.d. | n.d. | n.d. | n.d. | 0 | 0 | - | - | - | 0 | 0 | 100 | 0 | 0 | 100 | 0 | 0 | 7.8 |
| VOC | Chlorobromomethane | WG | N | 1 | ug/l | <0.3 | <0.3 | n.d. | n.d. | n.d. | n.d. | n.d. | 0 | 0 | - | - | - | - | - | - | - | - | - | 0 | 0 | 8.3 |
| VOC | Chlorodibromomethane | WG | N | 1 | ug/l | <0.22 | <0.22 | n.d. | n.d. | n.d. | n.d. | n.d. | 0 | 0 | - | - | - | 0 | 0 | 4 | 0 | 0 | 80 | 0 | 0 | 0.87 |
| VOC | Chloroethane | WG | N | 1 | ug/l | <0.37 | <0.37 | n.d. | n.d. | n.d. | n.d. | n.d. | 0 | 0 | - | - | - | - | - | - | - | - | - | 0 | 0 | 2100 |
| VOC | Chloroform | WG | N | 1 | ug/l | <0.22 | <0.22 | n.d. | n.d. | n.d. | n.d. | n.d. | 0 | 0 | - | - | - | 0 | 0 | 70 | 0 | 0 | 80 | 0 | 0 | 0.22 |
| VOC | Chloromethane | WG | N | 1 | ug/l | <0.22 | <0.22 | n.d. | n.d. | n.d. | n.d. | n.d. | 0 | 0 | - | - | - | 0 | 0 | 30 | - | - | - | 0 | 0 | 19 |
| VOC | cis-1,2-Dichloroethene | WG | N | 1 | ug/l | <0.26 | <0.26 | n.d. | n.d. | n.d. | n.d. | n.d. | 0 | 0 | - | - | - | 0 | 0 | 70 | - | - | - | - | - | - |
| VOC | cis-1,3-Dichloropropene | WG | N | 1 | ug/l | <0.16 | <0.16 | n.d. | n.d. | n.d. | n.d. | n.d. | 0 | 0 | - | - | - | 0 | 0 | 4 | - | - | - | - | - | - |
| VOC | Cyclohexane | WG | N | 1 | ug/l | <0.26 | <0.26 | n.d. | n.d. | n.d. | n.d. | n.d. | 0 | 0 | - | - | - | - | - | - | - | - | - | 0 | 0 | 1300 |
| VOC | Dichlorobromomethane | WG | N | 1 | ug/l | <0.15 | <0.15 | n.d. | n.d. | n.d. | n.d. | n.d. | 0 | 0 | - | - | - | 0 | 0 | 10 | 0 | 0 | 80 | 0 | 0 | 0.13 |
| VOC | Dichlorodifluoromethane | WG | N | 1 | ug/l | 3.1 | 3.1 | 3.10 | 3.10 | - | 3.10 | 3.10 | 1 | 100 | - | - | - | 0 | 0 | 1000 | - | - | - | 0 | 0 | 20 |
| VOC | Ethylbenzene | WG | N | 1 | ug/l | <0.3 | <0.3 | n.d. | n.d. | n.d. | n.d. | n.d. | 0 | 0 | - | - | - | 0 | 0 | 700 | 0 | 0 | 700 | 0 | 0 | 1.5 |
| VOC | Ethylene Dibromide | WG | N | 1 | ug/l | <0.19 | <0.19 | n.d. | n.d. | n.d. | n.d. | n.d. | 0 | 0 | - | - | - | 0 | 0 | 0.004 | - | - | - | - | - | - |
| VOC | Isopropylbenzene | WG | N | 1 | ug/l | <0.32 | <0.32 | n.d. | n.d. | n.d. | n.d. | n.d. | 0 | 0 | - | - | - | - | - | - | - | - | - | - | - | - |
| VOC | Methyl acetate | WG | N | 1 | ug/l | <0.58 | <0.58 | n.d. | n.d. | n.d. | n.d. | n.d. | 0 | 0 | - | - | - | - | - | - | - | - | - | 0 | 0 | 2000 |
| VOC | Methyl tert-butyl ether | WG | N | 1 | ug/l | <0.13 | <0.13 | n.d. | n.d. | n.d. | n.d. | n.d. | 0 | 0 | - | - | - | 0 | 0 | 30 | - | - | - | 0 | 0 | 14 |
| VOC | Methylcyclohexane | WG | N | 1 | ug/l | <0.22 | <0.22 | n.d. | n.d. | n.d. | n.d. | n.d. | 0 | 0 | - | - | - | - | - | - | - | - | - | - | - | - |
| VOC | Methylene Chloride | WG | N | 1 | ug/l | <0.21 | <0.21 | n.d. | n.d. | n.d. | n.d. | n.d. | 0 | 0 | - | - | - | 0 | 0 | 5 | 0 | 0 | 5 | 0 | 0 | 11 |
| VOC | m-Xylene & p-Xylene | WG | N | 1 | ug/l | <0.28 | <0.28 | n.d. | n.d. | n.d. | n.d. | n.d. | 0 | 0 | - | - | - | - | - | - | - | - | - | - | - | - |
| VOC | o-Xylene | WG | N | 1 | ug/l | <0.32 | <0.32 | n.d. | n.d. | n.d. | n.d. | n.d. | 0 | 0 | - | - | - | 0 | 0 | 10000 | - | - | - | 0 | 0 | 19 |
| VOC | Styrene | WG | N | 1 | ug/l | <0.17 | <0.17 | n.d. | n.d. | n.d. | n.d. | n.d. | 0 | 0 | - | - | - | 0 | 0 | 100 | 0 | 0 | 100 | 0 | 0 | 120 |
| VOC | Tetrachloroethene | WG | N | 1 | ug/l | <0.12 | <0.12 | n.d. | n.d. | n.d. | n.d. | n.d. | 0 | 0 | - | - | - | 0 | 0 | 5 | - | - | - | - | - | - |

Table 22. Groundwater in Monitoring Wells Screened Below Upper Hydrogeologic Unit Analytical Results Statistical Summary, Columbia Falls Aluminum Company, LLC, Phase I Site Characterization, 2000 Aluminum Drive, Columbia Falls, MT

| | | | | | | | | | | | | | | | CFMW-001 STANDARD | | | DEQ 7 Human Health Standards | | | EPA Drinking MCL | | | EPA Tapwater RSL | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Group | Analyte | Matrix | Fraction | No. of Results | Unit | Min | Max | Mean | Median | Standard Deviation | 5th Percentile | 95th Percentile | # > LOD | % > LOD | No. Exceeding | % Exceeding | Action Level | No. Exceeding | % Exceeding | Action Level | No. Exceeding | % Exceeding | Action Level | No. Exceeding | % Exceeding | Action Level |
| VOC | Toluene | WG | N | 1 | ug/l | <0.25 | <0.25 | n.d. | n.d. | n.d. | n.d. | n.d. | 0 | 0 | - | - | - | 0 | 0 | 1000 | 0 | 0 | 1000 | 0 | 0 | 110 |
| VOC | trans-1,2-Dichloroethene | WG | N | 1 | ug/l | <0.18 | <0.18 | n.d. | n.d. | n.d. | n.d. | n.d. | 0 | 0 | - | - | - | 0 | 0 | 100 | - | - | - | - | - | - |
| VOC | trans-1,3-Dichloropropene | WG | N | 1 | ug/l | <0.19 | <0.19 | n.d. | n.d. | n.d. | n.d. | n.d. | 0 | 0 | - | - | - | 0 | 0 | 2 | - | - | - | - | - | - |
| VOC | Trichloroethene | WG | N | 1 | ug/l | <0.22 | <0.22 | n.d. | n.d. | n.d. | n.d. | n.d. | 0 | 0 | - | - | - | 0 | 0 | 5 | - | - | - | - | - | - |
| VOC | Trichlorofluoromethane | WG | N | 2 | ug/l | <0.15 | <0.15 | n.d. | n.d. | n.d. | n.d. | n.d. | 0 | 0 | - | - | - | 0 | 0 | 10000 | - | - | - | 0 | 0 | 520 |

µg/kg - Micrograms per Kilograms
n.d - Non Detect
LOD - Limit of Detection
DEQ 7 Human Health Standards - Department of Environmental Quality-7 Human Health Standards
EPA Drinking MCL - Environmental Protection Agency Risk Based Screening Level Drinking water MCL
EPA Tapwater RSL - Environmental Protection Agency Risk Based Screening Level Tapwater RSL
N - Non Applicable
D - Dissolved
T - Total

**Table 23. Surface Water Analytical Results Statistical Summary**
**Columbia Falls Aluminum Company, LLC, Phase I Site Characterization, 2000 Aluminum Drive, Columbia Falls, MT**

| | | | | | | | | | | | | | | DEQ 7 Human Health Standards | | | EPA Drinking MCL | | | EPA Tapwater RSL | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Group | Analyte | Matrix | No. of Results | Unit | Min | Max | Mean | Median | Standard Deviation | 5th Percentile | 95th Percentile | # > LOD | % > LOD | No. Exceeding | % Exceeding | Action Level | No. Exceeding | % Exceeding | Action Level | No. Exceeding | % Exceeding | Action Level |
| GENCHEM | Ammonia | WS | 22 | ug/l | <23 | 178 | 14.01 | n.d. | 39.86 | n.d. | 159.25 | 4 | 18 | - | - | - | - | - | - | - | - | - |
| GENCHEM | Chloride | WS | 22 | ug/l | 335 | 3060 | 1621.36 | 1745.00 | 926.63 | 342.30 | 2904.50 | 22 | 100 | - | - | - | - | - | - | - | - | - |
| GENCHEM | Fluoride | WS | 22 | ug/l | 33.5 | 2570 | 331.03 | 57.50 | 730.38 | 33.90 | 2450.95 | 22 | 100 | 0.00 | 0 | 4000 | 0 | 0 | 4000 | 9 | 41 | 80 |
| GENCHEM | Hardness as calcium carbonate | WS | 22 | ug/l | 84000 | 222000 | 148909.09 | 164000.00 | 43353.38 | 86000.00 | 216100.00 | 22 | 100 | - | - | - | - | - | - | - | - | - |
| GENCHEM | Nitrate Nitrite as N | WS | 22 | ug/l | <100 | 1680 | 196.68 | n.d. | 492.15 | n.d. | 1646.00 | 5 | 23 | 0 | 0 | 10000 | 0 | 0 | 10000 | - | - | - |
| GENCHEM | Orthophosphate as P | WS | 7 | ug/l | <42 | <42 | n.d. | n.d. | n.d. | n.d. | n.d. | 0 | 0 | - | - | - | - | - | - | - | - | - |
| GENCHEM | Sulfate | WS | 22 | ug/l | 1900 | 18100 | 4824.09 | 3510.00 | 4459.86 | 1910.00 | 17282.00 | 22 | 100 | - | - | - | - | - | - | - | - | - |
| METALS | Aluminum | WS | 22 | ug/l | <13.5 | 937 | 102.75 | 33.55 | 214.86 | 16.80 | 522.00 | 21 | 95 | - | - | - | - | - | - | 0 | 0 | 2000 |
| METALS | Antimony | WS | 22 | ug/l | <0.62 | <0.76 | n.d. | n.d. | n.d. | n.d. | n.d. | 0 | 0 | 0 | 0 | 5.6 | 0 | 0 | 6 | 0 | 0 | 0.78 |
| METALS | Arsenic | WS | 22 | ug/l | <0.64 | 1.2 | 0.24 | n.d. | 0.41 | n.d. | 1.15 | 6 | 27 | 0.00 | 0 | 10 | 0 | 0 | 10 | 6 | 27 | 0.052 |
| METALS | Barium | WS | 22 | ug/l | 78 | 305 | 136.17 | 103.50 | 68.14 | 78.62 | 267.85 | 22 | 100 | 0 | 0 | 1000 | 0 | 0 | 2000 | 0 | 0 | 380 |
| METALS | Beryllium | WS | 22 | ug/l | <0.24 | <0.29 | n.d. | n.d. | n.d. | n.d. | n.d. | 0 | 0 | 0.00 | 0 | 4 | 0 | 0 | 4 | 0 | 0 | 2.5 |
| METALS | Cadmium | WS | 22 | ug/l | <0.71 | <0.72 | n.d. | n.d. | n.d. | n.d. | n.d. | 0 | 0 | 0 | 0 | 5 | - | - | - | - | - | - |
| METALS | Calcium | WS | 22 | ug/l | 23100 | 60700 | 41350.00 | 46000.00 | 11980.97 | 23200.00 | 59715.00 | 22 | 100 | - | - | - | - | - | - | - | - | - |
| METALS | Chromium | WS | 22 | ug/l | <1.3 | 3.9 | n.d. | n.d. | n.d. | n.d. | 3.80 | 2 | 9 | 0 | 0 | 100 | 0 | 0 | 100 | - | - | - |
| METALS | Cobalt | WS | 22 | ug/l | <1.3 | 1.3 | n.d. | n.d. | n.d. | n.d. | n.d. | 1 | 5 | - | - | - | - | - | - | 1 | 5 | 0.6 |
| METALS | Copper | WS | 22 | ug/l | <1.4 | 5.4 | 1.21 | n.d. | 1.59 | n.d. | 4.82 | 10 | 45 | 0 | 0 | 1300 | 0 | 0 | 1300 | 0 | 0 | 80 |
| METALS | Cyanide, Total | WS | 22 | ug/l | <2 | 213 | 20.85 | n.d. | 61.72 | n.d. | 212.00 | 6 | 27 | 2 | 9 | 140 | 2 | 9 | 200 | 6 | 27 | 0.15 |
| METALS | Iron | WS | 22 | ug/l | <42.4 | 827 | 91.08 | n.d. | 184.96 | n.d. | 590.75 | 10 | 45 | - | - | - | - | - | - | 0 | 0 | 1400 |
| METALS | Lead | WS | 22 | ug/l | <0.38 | 0.48 | n.d. | n.d. | n.d. | n.d. | 0.48 | 2 | 9 | 0 | 0 | 15 | 0 | 0 | 15 | 0 | 0 | 15 |
| METALS | Magnesium | WS | 22 | ug/l | 6010 | 18200 | 11411.36 | 10900.00 | 3912.25 | 6031.00 | 17720.00 | 22 | 100 | - | - | - | - | - | - | - | - | - |
| METALS | Manganese | WS | 22 | ug/l | <2.5 | 57.1 | 8.92 | 6.00 | 12.51 | n.d. | 32.39 | 15 | 68 | - | - | - | - | - | - | 1 | 4.55 | 43 |
| METALS | Mercury | WS | 22 | ug/l | <0.14 | <0.17 | n.d. | n.d. | n.d. | n.d. | n.d. | 0 | 0 | 0 | 0 | 0.05 | 0 | 0 | 2 | 0 | 0 | 0.063 |
| METALS | Nickel | WS | 22 | ug/l | <1.4 | <1.6 | n.d. | n.d. | n.d. | n.d. | n.d. | 0 | 0 | 0 | 0 | 100 | - | - | - | - | - | - |
| METALS | Potassium | WS | 22 | ug/l | 306 | 1120 | 559.45 | 532.50 | 244.15 | 311.30 | 1014.50 | 22 | 100 | - | - | - | - | - | - | - | - | - |
| METALS | Selenium | WS | 22 | ug/l | <0.73 | <0.79 | n.d. | n.d. | n.d. | n.d. | n.d. | 0 | 0 | 0.00 | 0 | 50 | 0 | 0 | 50 | 0 | 0 | 10 |
| METALS | Silver | WS | 22 | ug/l | <1.3 | <1.5 | n.d. | n.d. | n.d. | n.d. | n.d. | 0 | 0 | 0.00 | 0 | 100 | - | - | - | 0 | 0 | 9.4 |
| METALS | Sodium | WS | 22 | ug/l | 951 | 36900 | 6064.50 | 2605.00 | 10070.05 | 961.60 | 34925.00 | 22 | 100 | - | - | - | - | - | - | - | - | - |
| METALS | Thallium | WS | 22 | ug/l | <0.26 | <0.31 | n.d. | n.d. | n.d. | n.d. | n.d. | 0 | 0 | 0.00 | 0 | 0.24 | 0 | 0 | 2 | 0 | 0 | 0.02 |
| METALS | Vanadium | WS | 22 | ug/l | <1.9 | 2.2 | 0.95 | n.d. | 1.07 | n.d. | 2.20 | 10 | 45 | - | - | - | - | - | - | 0 | 0 | 8.6 |
| METALS | Zinc | WS | 22 | ug/l | <6.5 | 19.9 | n.d. | n.d. | n.d. | n.d. | 19.73 | 2 | 9 | 0 | 0 | 2000 | - | - | - | 0 | 0 | 600 |
| OC_PEST | 4,4'-DDD | WS | 3 | ug/l | <0.005 | <0.005 | n.d. | n.d. | n.d. | n.d. | n.d. | 0 | 0 | 0 | 0 | 0.0031 | - | - | - | 0 | 0 | 0.032 |
| OC_PEST | 4,4'-DDE | WS | 3 | ug/l | <0.004 | <0.004 | n.d. | n.d. | n.d. | n.d. | n.d. | 0 | 0 | 0.00 | 0 | 0.0022 | - | - | - | 0 | 0 | 0.046 |
| OC_PEST | 4,4'-DDT | WS | 3 | ug/l | <0.004 | <0.004 | n.d. | n.d. | n.d. | n.d. | n.d. | 0 | 0 | 0 | 0 | 0.0022 | - | - | - | 0 | 0 | 0.23 |
| OC_PEST | Aldrin | WS | 3 | ug/l | <0.004 | <0.004 | n.d. | n.d. | n.d. | n.d. | n.d. | 0 | 0 | 0.00 | 0 | 0.00049 | - | - | - | 0 | 0 | 0.00092 |
| OC_PEST | alpha-BHC | WS | 3 | ug/l | <0.006 | <0.006 | n.d. | n.d. | n.d. | n.d. | n.d. | 0 | 0 | 0 | 0 | 0.026 | - | - | - | 0 | 0 | 0.0072 |

**Table 23. Surface Water Analytical Results Statistical Summary**
**Columbia Falls Aluminum Company, LLC, Phase I Site Characterization, 2000 Aluminum Drive, Columbia Falls, MT**

| | | | | | | | | | | | | | | DEQ 7 Human Health Standards | | | EPA Drinking MCL | | | EPA Tapwater RSL | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Group | Analyte | Matrix | No. of Results | Unit | Min | Max | Mean | Median | Standard Deviation | 5th Percentile | 95th Percentile | # > LOD | % > LOD | No. Exceeding | % Exceeding | Action Level | No. Exceeding | % Exceeding | Action Level | No. Exceeding | % Exceeding | Action Level |
| OC_PEST | alpha-Chlordane | WS | 3 | ug/l | <0.004 | <0.004 | n.d. | n.d. | n.d. | n.d. | n.d. | 0 | 0 | 0.00 | 0 | 0.008 | - | - | - | - | - | - |
| OC_PEST | beta-BHC | WS | 3 | ug/l | <0.005 | <0.005 | n.d. | n.d. | n.d. | n.d. | n.d. | 0 | 0 | 0 | 0 | 0.091 | - | - | - | 0 | 0 | 0.025 |
| OC_PEST | delta-BHC | WS | 3 | ug/l | <0.006 | <0.006 | n.d. | n.d. | n.d. | n.d. | n.d. | 0 | 0 | - | - | - | - | - | - | - | - | - |
| OC_PEST | Dieldrin | WS | 3 | ug/l | <0.004 | <0.004 | n.d. | n.d. | n.d. | n.d. | n.d. | 0 | 0 | 0 | 0 | 0.00052 | - | - | - | 0 | 0 | 0.0018 |
| OC_PEST | Endosulfan I | WS | 3 | ug/l | <0.005 | <0.005 | n.d. | n.d. | n.d. | n.d. | n.d. | 0 | 0 | 0 | 0 | 62 | - | - | - | - | - | - |
| OC_PEST | Endosulfan II | WS | 3 | ug/l | <0.004 | <0.004 | n.d. | n.d. | n.d. | n.d. | n.d. | 0 | 0 | 0 | 0 | 62 | - | - | - | - | - | - |
| OC_PEST | Endosulfan sulfate | WS | 3 | ug/l | <0.005 | <0.005 | n.d. | n.d. | n.d. | n.d. | n.d. | 0 | 0 | 0.00 | 0 | 62 | - | - | - | - | - | - |
| OC_PEST | Endrin | WS | 3 | ug/l | <0.004 | <0.004 | n.d. | n.d. | n.d. | n.d. | n.d. | 0 | 0 | 0 | 0 | 0.059 | 0 | 0 | 2 | 0 | 0 | 0.23 |
| OC_PEST | Endrin aldehyde | WS | 3 | ug/l | <0.004 | <0.004 | n.d. | n.d. | n.d. | n.d. | n.d. | 0 | 0 | 0 | 0 | 0.29 | - | - | - | - | - | - |
| OC_PEST | Endrin ketone | WS | 3 | ug/l | <0.004 | <0.004 | n.d. | n.d. | n.d. | n.d. | n.d. | 0 | 0 | - | - | - | - | - | - | - | - | - |
| OC_PEST | gamma-BHC (Lindane) | WS | 3 | ug/l | <0.004 | <0.004 | n.d. | n.d. | n.d. | n.d. | n.d. | 0 | 0 | 0.00 | 0 | 0.2 | 0 | 0 | 0.2 | 0 | 0 | 0.042 |
| OC_PEST | gamma-Chlordane | WS | 3 | ug/l | <0.005 | <0.005 | n.d. | n.d. | n.d. | n.d. | n.d. | 0 | 0 | - | - | - | - | - | - | - | - | - |
| OC_PEST | Heptachlor | WS | 3 | ug/l | <0.004 | <0.004 | n.d. | n.d. | n.d. | n.d. | n.d. | 0 | 0 | 0 | 0 | 0.00079 | 0 | 0 | 0.4 | 0 | 0 | 0.0014 |
| OC_PEST | Heptachlor epoxide | WS | 3 | ug/l | <0.004 | <0.004 | n.d. | n.d. | n.d. | n.d. | n.d. | 0 | 0 | 0 | 0 | 0.00039 | 0 | 0 | 0.2 | 0 | 0 | 0.0014 |
| OC_PEST | Methoxychlor | WS | 3 | ug/l | <0.004 | <0.004 | n.d. | n.d. | n.d. | n.d. | n.d. | 0 | 0 | 0.00 | 0 | 40 | 0 | 0 | 40 | 0 | 0 | 3.7 |
| OC_PEST | Tetrachloro-m-xylene | WS | 3 | ug/l | 0.36 | 0.43 | 0.39 | 0.38 | 0.04 | 0.36 | 0.43 | 3 | 100 | - | - | - | - | - | - | - | - | - |
| OC_PEST | Toxaphene | WS | 3 | ug/l | <0.06 | <0.06 | n.d. | n.d. | n.d. | n.d. | n.d. | 0 | 0 | 0 | 0 | 0.0028 | 0 | 0 | 3 | 0 | 0 | 0.071 |
| PCB | Aroclor 1016 | WS | 3 | ug/l | <0.098 | <0.098 | n.d. | n.d. | n.d. | n.d. | n.d. | 0 | 0 | 0 | 0 | 0.00064 | - | - | - | 0 | 0 | 0.14 |
| PCB | Aroclor 1221 | WS | 3 | ug/l | <0.098 | <0.098 | n.d. | n.d. | n.d. | n.d. | n.d. | 0 | 0 | 0 | 0 | 0.00064 | - | - | - | 0 | 0 | 0.0047 |
| PCB | Aroclor 1232 | WS | 3 | ug/l | <0.098 | <0.098 | n.d. | n.d. | n.d. | n.d. | n.d. | 0 | 0 | 0 | 0 | 0.00064 | - | - | - | 0 | 0 | 0.0047 |
| PCB | Aroclor 1242 | WS | 3 | ug/l | <0.098 | <0.098 | n.d. | n.d. | n.d. | n.d. | n.d. | 0 | 0 | 0 | 0 | 0.00064 | - | - | - | 0 | 0 | 0.0078 |
| PCB | Aroclor 1248 | WS | 3 | ug/l | <0.098 | <0.098 | n.d. | n.d. | n.d. | n.d. | n.d. | 0 | 0 | 0 | 0 | 0.00064 | - | - | - | 0 | 0 | 0.0078 |
| PCB | Aroclor 1254 | WS | 3 | ug/l | <0.084 | <0.084 | n.d. | n.d. | n.d. | n.d. | n.d. | 0 | 0 | 0.00 | 0 | 0.00064 | - | - | - | 0 | 0 | 0.0078 |
| PCB | Aroclor 1260 | WS | 3 | ug/l | <0.084 | <0.084 | n.d. | n.d. | n.d. | n.d. | n.d. | 0 | 0 | 0 | 0 | 0.00064 | - | - | - | 0 | 0 | 0.0078 |
| PCB | Aroclor 1268 | WS | 3 | ug/l | <0.084 | <0.084 | n.d. | n.d. | n.d. | n.d. | n.d. | 0 | 0 | 0 | 0 | 0.00064 | - | - | - | - | - | - |
| PCB | Aroclor-1262 | WS | 3 | ug/l | <0.084 | <0.084 | n.d. | n.d. | n.d. | n.d. | n.d. | 0 | 0 | - | - | - | - | - | - | - | - | - |
| PCB | Polychlorinated biphenyls, Total | WS | 3 | ug/l | <0.098 | <0.098 | n.d. | n.d. | n.d. | n.d. | n.d. | 0 | 0 | 0 | 0 | 0.00064 | - | - | - | - | - | - |
| SVOC | 1,1'-Biphenyl | WS | 3 | ug/l | <0.63 | <0.68 | n.d. | n.d. | n.d. | n.d. | n.d. | 0 | 0 | - | - | - | - | - | - | 0 | 0 | 0.083 |
| SVOC | 1,2,4,5-Tetrachlorobenzene | WS | 3 | ug/l | <0.43 | <0.47 | n.d. | n.d. | n.d. | n.d. | n.d. | 0 | 0 | 0 | 0 | 0.97 | - | - | - | 0 | 0 | 0.17 |
| SVOC | 1,4-Dioxane | WS | 3 | ug/l | <3.1 | <3.4 | n.d. | n.d. | n.d. | n.d. | n.d. | 0 | 0 | - | - | - | - | - | - | 0 | 0 | 0.46 |
| SVOC | 2,2'-oxybis[1-chloropropane] | WS | 3 | ug/l | <0.93 | <1 | n.d. | n.d. | n.d. | n.d. | n.d. | 0 | 0 | 0.00 | 0 | 1400 | - | - | - | - | - | - |
| SVOC | 2,3,4,6-Tetrachlorophenol | WS | 3 | ug/l | <0.69 | <0.75 | n.d. | n.d. | n.d. | n.d. | n.d. | 0 | 0 | - | - | - | - | - | - | 0 | 0 | 24 |
| SVOC | 2,4,5-Trichlorophenol | WS | 3 | ug/l | <0.49 | <0.53 | n.d. | n.d. | n.d. | n.d. | n.d. | 0 | 0 | 0 | 0 | 1800 | - | - | - | 0 | 0 | 120 |
| SVOC | 2,4,6-Trichlorophenol | WS | 3 | ug/l | <0.53 | <0.58 | n.d. | n.d. | n.d. | n.d. | n.d. | 0 | 0 | 0 | 0 | 14 | - | - | - | 0 | 0 | 1.2 |
| SVOC | 2,4-Dichlorophenol | WS | 3 | ug/l | <0.63 | <0.68 | n.d. | n.d. | n.d. | n.d. | n.d. | 0 | 0 | 0 | 0 | 77 | - | - | - | 0 | 0 | 4.6 |
| SVOC | 2,4-Dimethylphenol | WS | 3 | ug/l | <0.91 | <0.99 | n.d. | n.d. | n.d. | n.d. | n.d. | 0 | 0 | 0 | 0 | 380 | - | - | - | 0 | 0 | 36 |

**Table 23. Surface Water Analytical Results Statistical Summary**
**Columbia Falls Aluminum Company, LLC, Phase I Site Characterization, 2000 Aluminum Drive, Columbia Falls, MT**

| Group | Analyte | Matrix | No. of Results | Unit | Min | Max | Mean | Median | Standard Deviation | 5th Percentile | 95th Percentile | # > LOD | % > LOD | DEQ 7 Human Health Standards No. Exceeding | DEQ 7 Human Health Standards % Exceeding | DEQ 7 Human Health Standards Action Level | EPA Drinking MCL No. Exceeding | EPA Drinking MCL % Exceeding | EPA Drinking MCL Action Level | EPA Tapwater RSL No. Exceeding | EPA Tapwater RSL % Exceeding | EPA Tapwater RSL Action Level |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| SVOC | 2,4-Dinitrophenol | WS | 3 | ug/l | <2.4 | <2.6 | n.d. | n.d. | n.d. | n.d. | n.d. | 0 | 0 | 0 | 0 | 69 | - | - | - | 0 | 0 | 3.9 |
| SVOC | 2,4-Dinitrotoluene | WS | 3 | ug/l | <1 | <1.1 | n.d. | n.d. | n.d. | n.d. | n.d. | 0 | 0 | 0 | 0 | 1.1 | - | - | - | 0 | 0 | 0.24 |
| SVOC | 2,6-Dinitrotoluene | WS | 3 | ug/l | <0.88 | <0.96 | n.d. | n.d. | n.d. | n.d. | n.d. | 0 | 0 | 0 | 0 | 0.5 | - | - | - | 0 | 0 | 0.049 |
| SVOC | 2-Chloronaphthalene | WS | 3 | ug/l | <0.61 | <0.66 | n.d. | n.d. | n.d. | n.d. | n.d. | 0 | 0 | 0 | 0 | 1000 | - | - | - | - | - | - |
| SVOC | 2-Chlorophenol | WS | 3 | ug/l | <0.74 | <0.8 | n.d. | n.d. | n.d. | n.d. | n.d. | 0 | 0 | 0 | 0 | 81 | - | - | - | 0 | 0 | 9.1 |
| SVOC | 2-Methylnaphthalene | WS | 3 | ug/l | <0.88 | <0.96 | n.d. | n.d. | n.d. | n.d. | n.d. | 0 | 0 | - | - | - | - | - | - | 0 | 0 | 3.6 |
| SVOC | 2-Methylphenol | WS | 3 | ug/l | <1.3 | <1.4 | n.d. | n.d. | n.d. | n.d. | n.d. | 0 | 0 | - | - | - | - | - | - | - | - | - |
| SVOC | 2-Nitroaniline | WS | 3 | ug/l | <0.65 | <0.71 | n.d. | n.d. | n.d. | n.d. | n.d. | 0 | 0 | - | - | - | - | - | - | 0 | 0 | 19 |
| SVOC | 2-Nitrophenol | WS | 3 | ug/l | <0.59 | <0.64 | n.d. | n.d. | n.d. | n.d. | n.d. | 0 | 0 | - | - | - | - | - | - | - | - | - |
| SVOC | 3 & 4 Methylphenol | WS | 3 | ug/l | <0.88 | <0.96 | n.d. | n.d. | n.d. | n.d. | n.d. | 0 | 0 | - | - | - | - | - | - | - | - | - |
| SVOC | 3,3'-Dichlorobenzidine | WS | 3 | ug/l | <1 | <1.1 | n.d. | n.d. | n.d. | n.d. | n.d. | 0 | 0 | 0 | 0 | 0.21 | - | - | - | 0 | 0 | 0.13 |
| SVOC | 3-Nitroaniline | WS | 3 | ug/l | <0.82 | <0.89 | n.d. | n.d. | n.d. | n.d. | n.d. | 0 | 0 | - | - | - | - | - | - | - | - | - |
| SVOC | 4,6-Dinitro-2-methylphenol | WS | 3 | ug/l | <2 | <2.2 | n.d. | n.d. | n.d. | n.d. | n.d. | 0 | 0 | 0 | 0 | 13 | - | - | - | - | - | - |
| SVOC | 4-Bromophenyl phenyl ether | WS | 3 | ug/l | <1 | <1.1 | n.d. | n.d. | n.d. | n.d. | n.d. | 0 | 0 | - | - | - | - | - | - | - | - | - |
| SVOC | 4-Chloro-3-methylphenol | WS | 3 | ug/l | <0.76 | <0.83 | n.d. | n.d. | n.d. | n.d. | n.d. | 0 | 0 | 0.00 | 0 | 3000 | - | - | - | - | - | - |
| SVOC | 4-Chloroaniline | WS | 3 | ug/l | <0.73 | <0.79 | n.d. | n.d. | n.d. | n.d. | n.d. | 0 | 0 | - | - | - | - | - | - | 0 | 0 | 0.37 |
| SVOC | 4-Chlorophenyl phenyl ether | WS | 3 | ug/l | <0.96 | <1 | n.d. | n.d. | n.d. | n.d. | n.d. | 0 | 0 | - | - | - | - | - | - | - | - | - |
| SVOC | 4-Nitroaniline | WS | 3 | ug/l | <0.48 | <0.52 | n.d. | n.d. | n.d. | n.d. | n.d. | 0 | 0 | - | - | - | - | - | - | 0 | 0 | 3.8 |
| SVOC | 4-Nitrophenol | WS | 3 | ug/l | <4.7 | <5.1 | n.d. | n.d. | n.d. | n.d. | n.d. | 0 | 0 | 0 | 0 | 60 | - | - | - | - | - | - |
| SVOC | Acenaphthene | WS | 3 | ug/l | <0.88 | <0.96 | n.d. | n.d. | n.d. | n.d. | n.d. | 0 | 0 | 0 | 0 | 670 | - | - | - | 0 | 0 | 53 |
| SVOC | Acenaphthylene | WS | 3 | ug/l | <0.65 | <0.71 | n.d. | n.d. | n.d. | n.d. | n.d. | 0 | 0 | - | - | - | - | - | - | - | - | - |
| SVOC | Acetophenone | WS | 3 | ug/l | <1 | <1.1 | n.d. | n.d. | n.d. | n.d. | n.d. | 0 | 0 | - | - | - | - | - | - | 0 | 0 | 190 |
| SVOC | Anthracene | WS | 3 | ug/l | <0.57 | <0.62 | n.d. | n.d. | n.d. | n.d. | n.d. | 0 | 0 | 0 | 0 | 8300 | - | - | - | 0 | 0 | 180 |
| SVOC | Atrazine | WS | 3 | ug/l | <0.77 | <0.84 | n.d. | n.d. | n.d. | n.d. | n.d. | 0 | 0 | 0 | 0 | 3 | 0 | 0 | 3 | 0 | 0 | 0.3 |
| SVOC | Benzaldehyde | WS | 3 | ug/l | <0.86 | <0.93 | n.d. | n.d. | n.d. | n.d. | n.d. | 0 | 0 | - | - | - | - | - | - | 0 | 0 | 19 |
| SVOC | Benzo[a]anthracene | WS | 3 | ug/l | <0.55 | <0.6 | n.d. | n.d. | n.d. | n.d. | n.d. | 0 | 0 | 0 | 0 | 0.038 | - | - | - | - | - | - |
| SVOC | Benzo[a]pyrene | WS | 3 | ug/l | <0.16 | <0.17 | n.d. | n.d. | n.d. | n.d. | n.d. | 0 | 0 | 0 | 0 | 0.038 | 0 | 0 | 0.2 | 0 | 0 | 0.0034 |
| SVOC | Benzo[b]fluoranthene | WS | 3 | ug/l | <0.44 | <0.48 | n.d. | n.d. | n.d. | n.d. | n.d. | 0 | 0 | 0 | 0 | 0.038 | - | - | - | 0 | 0 | 0.034 |
| SVOC | Benzo[g,h,i]perylene | WS | 3 | ug/l | <0.75 | <0.82 | n.d. | n.d. | n.d. | n.d. | n.d. | 0 | 0 | - | - | - | - | - | - | - | - | - |
| SVOC | Benzo[k]fluoranthene | WS | 3 | ug/l | <0.18 | <0.2 | n.d. | n.d. | n.d. | n.d. | n.d. | 0 | 0 | 0.00 | 0 | 0.038 | - | - | - | 0 | 0 | 0.34 |
| SVOC | Bis(2-chloroethoxy)methane | WS | 3 | ug/l | <0.69 | <0.75 | n.d. | n.d. | n.d. | n.d. | n.d. | 0 | 0 | - | - | - | - | - | - | 0 | 0 | 5.9 |
| SVOC | Bis(2-chloroethyl)ether | WS | 3 | ug/l | <0.12 | <0.13 | n.d. | n.d. | n.d. | n.d. | n.d. | 0 | 0 | 0.00 | 0 | 0.3 | - | - | - | 0 | 0 | 0.014 |
| SVOC | Bis(2-ethylhexyl) phthalate | WS | 3 | ug/l | <0.72 | <0.78 | n.d. | n.d. | n.d. | n.d. | n.d. | 0 | 0 | 0.00 | 0 | 6 | 0 | 0 | 6 | 0 | 0 | 5.6 |
| SVOC | Butyl benzyl phthalate | WS | 3 | ug/l | <0.6 | <0.65 | n.d. | n.d. | n.d. | n.d. | n.d. | 0 | 0 | 0 | 0 | 1500 | - | - | - | 0 | 0 | 16 |
| SVOC | Caprolactam | WS | 3 | ug/l | <1.1 | <1.1 | n.d. | n.d. | n.d. | n.d. | n.d. | 0 | 0 | - | - | - | - | - | - | 0 | 0 | 990 |
| SVOC | Carbazole | WS | 3 | ug/l | <0.85 | <0.92 | n.d. | n.d. | n.d. | n.d. | n.d. | 0 | 0 | - | - | - | - | - | - | - | - | - |

**Table 23. Surface Water Analytical Results Statistical Summary**
**Columbia Falls Aluminum Company, LLC, Phase I Site Characterization, 2000 Aluminum Drive, Columbia Falls, MT**

| | | | | | | | | | | | | | | DEQ 7 Human Health Standards | | | EPA Drinking MCL | | | EPA Tapwater RSL | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Group | Analyte | Matrix | No. of Results | Unit | Min | Max | Mean | Median | Standard Deviation | 5th Percentile | 95th Percentile | # > LOD | % > LOD | No. Exceeding | % Exceeding | Action Level | No. Exceeding | % Exceeding | Action Level | No. Exceeding | % Exceeding | Action Level |
| SVOC | Chrysene | WS | 3 | ug/l | <0.67 | <0.73 | n.d. | n.d. | n.d. | n.d. | n.d. | 0 | 0 | 0 | 0 | 0.038 | - | - | - | 0 | 0 | 3.4 |
| SVOC | Dibenz(a,h)anthracene | WS | 3 | ug/l | <0.09 | <0.098 | n.d. | n.d. | n.d. | n.d. | n.d. | 0 | 0 | 0 | 0 | 0.038 | - | - | - | 0 | 0 | 0.0034 |
| SVOC | Dibenzofuran | WS | 3 | ug/l | <0.85 | <0.92 | n.d. | n.d. | n.d. | n.d. | n.d. | 0 | 0 | - | - | - | - | - | - | 0 | 0 | 0.79 |
| SVOC | Diethyl phthalate | WS | 3 | ug/l | <1 | <1.1 | n.d. | n.d. | n.d. | n.d. | n.d. | 0 | 0 | 0 | 0 | 17000 | - | - | - | - | - | - |
| SVOC | Dimethyl phthalate | WS | 3 | ug/l | <0.98 | <1.1 | n.d. | n.d. | n.d. | n.d. | n.d. | 0 | 0 | 0 | 0 | 270000 | - | - | - | - | - | - |
| SVOC | Di-n-butyl phthalate | WS | 3 | ug/l | <0.82 | <0.89 | n.d. | n.d. | n.d. | n.d. | n.d. | 0 | 0 | 0 | 0 | 2000 | - | - | - | - | - | - |
| SVOC | Di-n-octyl phthalate | WS | 3 | ug/l | <0.69 | <0.75 | n.d. | n.d. | n.d. | n.d. | n.d. | 0 | 0 | - | - | - | - | - | - | 0 | 0 | 20 |
| SVOC | Fluoranthene | WS | 3 | ug/l | <0.72 | <0.78 | n.d. | n.d. | n.d. | n.d. | n.d. | 0 | 0 | 0 | 0 | 130 | - | - | - | 0 | 0 | 80 |
| SVOC | Fluorene | WS | 3 | ug/l | <0.8 | <0.87 | n.d. | n.d. | n.d. | n.d. | n.d. | 0 | 0 | 0 | 0 | 1100 | - | - | - | 0 | 0 | 29 |
| SVOC | Hexachlorobenzene | WS | 3 | ug/l | <0.47 | <0.51 | n.d. | n.d. | n.d. | n.d. | n.d. | 0 | 0 | 0.00 | 0 | 0.0028 | 0 | 0 | 1 | 0 | 0 | 0.0098 |
| SVOC | Hexachlorobutadiene | WS | 3 | ug/l | <0.76 | <0.83 | n.d. | n.d. | n.d. | n.d. | n.d. | 0 | 0 | 0 | 0 | 4.4 | - | - | - | 0 | 0 | 0.14 |
| SVOC | Hexachlorocyclopentadiene | WS | 3 | ug/l | <0.61 | <0.66 | n.d. | n.d. | n.d. | n.d. | n.d. | 0 | 0 | 0 | 0 | 40 | 0 | 0 | 50 | 0 | 0 | 0.041 |
| SVOC | Hexachloroethane | WS | 3 | ug/l | <0.09 | <0.098 | n.d. | n.d. | n.d. | n.d. | n.d. | 0 | 0 | 0 | 0 | 14 | - | - | - | 0 | 0 | 0.33 |
| SVOC | Indeno[1,2,3-cd]pyrene | WS | 3 | ug/l | <0.21 | <0.23 | n.d. | n.d. | n.d. | n.d. | n.d. | 0 | 0 | 0 | 0 | 0.038 | - | - | - | 0 | 0 | 0.034 |
| SVOC | Isophorone | WS | 3 | ug/l | <0.67 | <0.73 | n.d. | n.d. | n.d. | n.d. | n.d. | 0 | 0 | 0.00 | 0 | 350 | - | - | - | 0 | 0 | 78 |
| SVOC | Naphthalene | WS | 3 | ug/l | <0.8 | <0.87 | n.d. | n.d. | n.d. | n.d. | n.d. | 0 | 0 | 0 | 0 | 100 | - | - | - | 0 | 0 | 0.17 |
| SVOC | Nitrobenzene | WS | 3 | ug/l | <0.49 | <0.53 | n.d. | n.d. | n.d. | n.d. | n.d. | 0 | 0 | 0 | 0 | 17 | - | - | - | 0 | 0 | 0.14 |
| SVOC | N-Nitrosodi-n-propylamine | WS | 3 | ug/l | <0.83 | <0.9 | n.d. | n.d. | n.d. | n.d. | n.d. | 0 | 0 | 0 | 0 | 0.05 | - | - | - | 0 | 0 | 0.011 |
| SVOC | N-Nitrosodiphenylamine | WS | 3 | ug/l | <0.74 | <0.8 | n.d. | n.d. | n.d. | n.d. | n.d. | 0 | 0 | 0 | 0 | 33 | - | - | - | 0 | 0 | 12 |
| SVOC | Pentachlorophenol | WS | 3 | ug/l | <2.2 | <2.4 | n.d. | n.d. | n.d. | n.d. | n.d. | 0 | 0 | 0.00 | 0 | 1 | 0 | 0 | 1 | 0 | 0 | 0.041 |
| SVOC | Phenanthrene | WS | 3 | ug/l | <0.65 | <0.71 | n.d. | n.d. | n.d. | n.d. | n.d. | 0 | 0 | - | - | - | - | - | - | - | - | - |
| SVOC | Phenol | WS | 3 | ug/l | <0.41 | <0.45 | n.d. | n.d. | n.d. | n.d. | n.d. | 0 | 0 | 0 | 0 | 300 | - | - | - | 0 | 0 | 580 |
| SVOC | Pyrene | WS | 3 | ug/l | <0.83 | <0.9 | n.d. | n.d. | n.d. | n.d. | n.d. | 0 | 0 | 0.00 | 0 | 830 | - | - | - | 0 | 0 | 12 |
| VOC | 1,1,1-Trichloroethane | WS | 3 | ug/l | <0.28 | <0.28 | n.d. | n.d. | n.d. | n.d. | n.d. | 0 | 0 | 0 | 0 | 200 | 0 | 0 | 200 | 0 | 0 | 800 |
| VOC | 1,1,2,2-Tetrachloroethane | WS | 3 | ug/l | <0.19 | <0.19 | n.d. | n.d. | n.d. | n.d. | n.d. | 0 | 0 | 0 | 0 | 1.7 | - | - | - | - | - | - |
| VOC | 1,1,2-Trichloro-1,2,2-trifluoroethane | WS | 3 | ug/l | <0.34 | <0.34 | n.d. | n.d. | n.d. | n.d. | n.d. | 0 | 0 | - | - | - | - | - | - | 0 | 0 | 5500 |
| VOC | 1,1,2-Trichloroethane | WS | 3 | ug/l | <0.08 | <0.08 | n.d. | n.d. | n.d. | n.d. | n.d. | 0 | 0 | 0.00 | 0 | 3 | - | - | - | - | - | - |
| VOC | 1,1-Dichloroethane | WS | 3 | ug/l | <0.24 | <0.24 | n.d. | n.d. | n.d. | n.d. | n.d. | 0 | 0 | - | - | - | - | - | - | 0 | 0 | 2.8 |
| VOC | 1,1-Dichloroethene | WS | 3 | ug/l | <0.34 | <0.34 | n.d. | n.d. | n.d. | n.d. | n.d. | 0 | 0 | 0 | 0 | 7 | - | - | - | - | - | - |
| VOC | 1,2,3-Trichlorobenzene | WS | 3 | ug/l | <0.35 | <0.35 | n.d. | n.d. | n.d. | n.d. | n.d. | 0 | 0 | - | - | - | - | - | - | 0 | 0 | 0.7 |
| VOC | 1,2,4-Trichlorobenzene | WS | 3 | ug/l | <0.27 | <0.27 | n.d. | n.d. | n.d. | n.d. | n.d. | 0 | 0 | 0 | 0 | 35 | - | - | - | 0 | 0 | 0.4 |
| VOC | 1,2-Dibromo-3-Chloropropane | WS | 3 | ug/l | <0.23 | <0.23 | n.d. | n.d. | n.d. | n.d. | n.d. | 0 | 0 | 0 | 0 | 0.2 | 0 | 0 | 0.2 | 0 | 0 | 0.00034 |
| VOC | 1,2-Dichlorobenzene | WS | 3 | ug/l | <0.22 | <0.22 | n.d. | n.d. | n.d. | n.d. | n.d. | 0 | 0 | 0.00 | 0 | 420 | 0 | 0 | 600 | 0 | 0 | 30 |
| VOC | 1,2-Dichloroethane | WS | 3 | ug/l | <0.25 | <0.25 | n.d. | n.d. | n.d. | n.d. | n.d. | 0 | 0 | 0 | 0 | 3.8 | 0 | 0 | 5 | 0 | 0 | 0.17 |
| VOC | 1,2-Dichloropropane | WS | 3 | ug/l | <0.18 | <0.18 | n.d. | n.d. | n.d. | n.d. | n.d. | 0 | 0 | 0 | 0 | 5 | 0 | 0 | 5 | 0 | 0 | 0.44 |
| VOC | 1,3-Dichlorobenzene | WS | 3 | ug/l | <0.33 | <0.33 | n.d. | n.d. | n.d. | n.d. | n.d. | 0 | 0 | 0 | 0 | 320 | - | - | - | - | - | - |

**Table 23. Surface Water Analytical Results Statistical Summary**
**Columbia Falls Aluminum Company, LLC, Phase I Site Characterization, 2000 Aluminum Drive, Columbia Falls, MT**



| | | | | | | | | | | | | | | DEQ 7 Human Health Standards | | | EPA Drinking MCL | | | EPA Tapwater RSL | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Group | Analyte | Matrix | No. of Results | Unit | Min | Max | Mean | Median | Standard Deviation | 5th Percentile | 95th Percentile | # > LOD | % > LOD | No. Exceeding | % Exceeding | Action Level | No. Exceeding | % Exceeding | Action Level | No. Exceeding | % Exceeding | Action Level |
| VOC | 1,4-Dichlorobenzene | WS | 3 | ug/l | <0.33 | <0.33 | n.d. | n.d. | n.d. | n.d. | n.d. | 0 | 0 | 0.00 | 0 | 75 | 0 | 0 | 75 | 0 | 0 | 0.48 |
| VOC | 2-Butanone (MEK) | WS | 3 | ug/l | <2.2 | <2.2 | n.d. | n.d. | n.d. | n.d. | n.d. | 0 | 0 | - | - | - | - | - | - | 0 | 0 | 560 |
| VOC | 2-Hexanone | WS | 3 | ug/l | <0.72 | <0.72 | n.d. | n.d. | n.d. | n.d. | n.d. | 0 | 0 | - | - | - | - | - | - | 0 | 0 | 3.8 |
| VOC | 4-Methyl-2-pentanone (MIBK) | WS | 3 | ug/l | <0.63 | <0.63 | n.d. | n.d. | n.d. | n.d. | n.d. | 0 | 0 | - | - | - | - | - | - | 0 | 0 | 630 |
| VOC | Acetone | WS | 3 | ug/l | <1.1 | <1.1 | n.d. | n.d. | n.d. | n.d. | n.d. | 0 | 0 | - | - | - | - | - | - | 0 | 0 | 1400 |
| VOC | Benzene | WS | 3 | ug/l | <0.09 | <0.09 | n.d. | n.d. | n.d. | n.d. | n.d. | 0 | 0 | 0.00 | 0 | 5 | 0 | 0 | 5 | 0 | 0 | 0.46 |
| VOC | Bromoform | WS | 3 | ug/l | <0.18 | <0.18 | n.d. | n.d. | n.d. | n.d. | n.d. | 0 | 0 | 0 | 0 | 43 | 0 | 0 | 80 | 0 | 0 | 3.3 |
| VOC | Bromomethane | WS | 3 | ug/l | <0.18 | <0.18 | n.d. | n.d. | n.d. | n.d. | n.d. | 0 | 0 | 0 | 0 | 47 | - | - | - | 0 | 0 | 0.75 |
| VOC | Carbon disulfide | WS | 3 | ug/l | <0.22 | <0.22 | n.d. | n.d. | n.d. | n.d. | n.d. | 0 | 0 | - | - | - | - | - | - | 0 | 0 | 81 |
| VOC | Carbon tetrachloride | WS | 3 | ug/l | <0.33 | <0.33 | n.d. | n.d. | n.d. | n.d. | n.d. | 0 | 0 | 0 | 0 | 2.3 | 0 | 0 | 5 | 0 | 0 | 0.46 |
| VOC | Chlorobenzene | WS | 3 | ug/l | <0.24 | <0.24 | n.d. | n.d. | n.d. | n.d. | n.d. | 0 | 0 | 0 | 0 | 100 | 0 | 0 | 100 | 0 | 0 | 7.8 |
| VOC | Chlorobromomethane | WS | 3 | ug/l | <0.3 | <0.3 | n.d. | n.d. | n.d. | n.d. | n.d. | 0 | 0 | - | - | - | - | - | - | 0 | 0 | 8.3 |
| VOC | Chlorodibromomethane | WS | 3 | ug/l | <0.22 | <0.22 | n.d. | n.d. | n.d. | n.d. | n.d. | 0 | 0 | 0 | 0 | 4 | 0 | 0 | 80 | 0 | 0 | 0.87 |
| VOC | Chloroethane | WS | 3 | ug/l | <0.37 | <0.37 | n.d. | n.d. | n.d. | n.d. | n.d. | 0 | 0 | - | - | - | - | - | - | 0 | 0 | 2100 |
| VOC | Chloroform | WS | 3 | ug/l | <0.22 | <0.22 | n.d. | n.d. | n.d. | n.d. | n.d. | 0 | 0 | 0.00 | 0 | 57 | 0 | 0 | 80 | 0 | 0 | 0.22 |
| VOC | Chloromethane | WS | 3 | ug/l | <0.22 | <0.22 | n.d. | n.d. | n.d. | n.d. | n.d. | 0 | 0 | 0 | 0 | 30 | - | - | - | 0 | 0 | 19 |
| VOC | cis-1,2-Dichloroethene | WS | 3 | ug/l | <0.26 | <0.26 | n.d. | n.d. | n.d. | n.d. | n.d. | 0 | 0 | 0 | 0 | 70 | - | - | - | - | - | - |
| VOC | cis-1,3-Dichloropropene | WS | 3 | ug/l | <0.16 | <0.16 | n.d. | n.d. | n.d. | n.d. | n.d. | 0 | 0 | 0 | 0 | 3.4 | - | - | - | - | - | - |
| VOC | Cyclohexane | WS | 3 | ug/l | <0.26 | <0.26 | n.d. | n.d. | n.d. | n.d. | n.d. | 0 | 0 | - | - | - | - | - | - | 0 | 0 | 1300 |
| VOC | Dichlorobromomethane | WS | 3 | ug/l | <0.15 | <0.15 | n.d. | n.d. | n.d. | n.d. | n.d. | 0 | 0 | 0 | 0 | 5.5 | 0 | 0 | 80 | 0 | 0 | 0.13 |
| VOC | Dichlorodifluoromethane | WS | 3 | ug/l | <0.14 | <0.14 | n.d. | n.d. | n.d. | n.d. | n.d. | 0 | 0 | - | - | - | - | - | - | 0 | 0 | 20 |
| VOC | Ethylbenzene | WS | 3 | ug/l | <0.3 | <0.3 | n.d. | n.d. | n.d. | n.d. | n.d. | 0 | 0 | 0 | 0 | 530 | 0 | 0 | 700 | 0 | 0 | 1.5 |
| VOC | Ethylene Dibromide | WS | 3 | ug/l | <0.19 | <0.19 | n.d. | n.d. | n.d. | n.d. | n.d. | 0 | 0 | - | - | - | - | - | - | - | - | - |
| VOC | Isopropylbenzene | WS | 3 | ug/l | <0.32 | <0.32 | n.d. | n.d. | n.d. | n.d. | n.d. | 0 | 0 | - | - | - | - | - | - | - | - | - |
| VOC | Methyl acetate | WS | 3 | ug/l | <0.58 | <0.58 | n.d. | n.d. | n.d. | n.d. | n.d. | 0 | 0 | - | - | - | - | - | - | 0 | 0 | 2000 |
| VOC | Methyl tert-butyl ether | WS | 3 | ug/l | <0.13 | <0.13 | n.d. | n.d. | n.d. | n.d. | n.d. | 0 | 0 | 0 | 0 | 30 | - | - | - | 0 | 0 | 14 |
| VOC | Methylcyclohexane | WS | 3 | ug/l | <0.22 | <0.22 | n.d. | n.d. | n.d. | n.d. | n.d. | 0 | 0 | - | - | - | - | - | - | - | - | - |
| VOC | Methylene Chloride | WS | 3 | ug/l | <0.21 | 0.9 | 0.46 | 0.47 | 0.45 | n.d. | 0.88 | 2 | 67 | 0 | 0 | 5 | 0 | 0 | 5 | 0 | 0 | 11 |
| VOC | m-Xylene & p-Xylene | WS | 3 | ug/l | <0.28 | <0.28 | n.d. | n.d. | n.d. | n.d. | n.d. | 0 | 0 | - | - | - | - | - | - | - | - | - |
| VOC | o-Xylene | WS | 3 | ug/l | <0.32 | <0.32 | n.d. | n.d. | n.d. | n.d. | n.d. | 0 | 0 | 0 | 0 | 10000 | - | - | - | 0 | 0 | 19 |
| VOC | Styrene | WS | 3 | ug/l | <0.17 | <0.17 | n.d. | n.d. | n.d. | n.d. | n.d. | 0 | 0 | 0 | 0 | 100 | 0 | 0 | 100 | 0 | 0 | 120 |
| VOC | Tetrachloroethene | WS | 3 | ug/l | <0.12 | <0.12 | n.d. | n.d. | n.d. | n.d. | n.d. | 0 | 0 | 0 | 0 | 5 | - | - | - | - | - | - |
| VOC | Toluene | WS | 3 | ug/l | <0.25 | <0.25 | n.d. | n.d. | n.d. | n.d. | n.d. | 0 | 0 | 0 | 0 | 1000 | 0 | 0 | 1000 | 0 | 0 | 110 |
| VOC | trans-1,2-Dichloroethene | WS | 3 | ug/l | <0.18 | <0.18 | n.d. | n.d. | n.d. | n.d. | n.d. | 0 | 0 | 0 | 0 | 100 | - | - | - | - | - | - |
| VOC | trans-1,3-Dichloropropene | WS | 3 | ug/l | <0.19 | <0.19 | n.d. | n.d. | n.d. | n.d. | n.d. | 0 | 0 | 0.00 | 0 | 2 | - | - | - | - | - | - |
| VOC | Trichloroethene | WS | 3 | ug/l | <0.22 | <0.22 | n.d. | n.d. | n.d. | n.d. | n.d. | 0 | 0 | 0 | 0 | 5 | - | - | - | - | - | - |

**Table 23. Surface Water Analytical Results Statistical Summary**
**Columbia Falls Aluminum Company, LLC, Phase I Site Characterization, 2000 Aluminum Drive, Columbia Falls, MT**

| | | | | | | | | | | | | | | DEQ 7 Human Health Standards | | | EPA Drinking MCL | | | EPA Tapwater RSL | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Group | Analyte | Matrix | No. of Results | Unit | Min | Max | Mean | Median | Standard Deviation | 5th Percentile | 95th Percentile | # > LOD | % > LOD | No. Exceeding | % Exceeding | Action Level | No. Exceeding | % Exceeding | Action Level | No. Exceeding | % Exceeding | Action Level |
| VOC | Trichlorofluoromethane | WS | 3 | ug/l | <0.15 | <0.15 | n.d. | n.d. | n.d. | n.d. | n.d. | 0 | 0 | 0 | 0 | 10000 | - | - | - | 0 | 0 | 520 |
| VOC | Vinyl chloride | WS | 3 | ug/l | <0.06 | <0.06 | n.d. | n.d. | n.d. | n.d. | n.d. | 0 | 0 | 0 | 0 | 0.25 | 0 | 0 | 2 | 0 | 0 | 0.019 |

ug/l - Micrograms per Liter
n.d - Non Detect
LOD - Limit of Detection
DEQ 7 Human Health Standards - Department of Environmental Quality-7 Human Health Standards
EPA Drinking MCL - Environmental Protection Agency Risk Based Screening Level Drinking water MCL
EPA Tapwater RSL - Environmental Protection Agency Risk Based Screening Level Tapwater RSL

**Table 24. Sediment Analytical Results Statistical Summary**
**Columbia Falls Aluminum Company, LLC, Phase I Site Characterization, 2000 Aluminum Drive, Columbia Falls, MT**

| | | | | | | | | | | | | | | Industrial RSL | | | Residential RSL | | | Risk SSL | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Group | Analyte | Matrix | No. of Results | Unit | Min | Max | Mean | Median | Standard Deviation | 5th Percentile | 95th Percentile | # > LOD | % > LOD | No. Exceeding | % Exceeding | Action Level | No. Exceeding | % Exceeding | Action Level | No. Exceeding | % Exceeding | Action Level |
| GENCHEM | Fluoride | SE | 12 | mg/kg | 1.23 | 219 | 30.67 | 9.49 | 61.43 | 1.33 | 129.68 | 12 | 100 | 0 | 0 | 4700 | 0 | 0 | 310 | 5 | 42 | 12 |
| GENCHEM | Total Organic Carbon (1) | SE | 12 | mg/kg | 4130 | 494000 | 200877.50 | 206500.00 | 167946.14 | 16543.50 | 480800.00 | 12 | 100 | - | - | - | - | - | - | - | - | - |
| METALS | Aluminum | SE | 12 | mg/kg | 2360 | 112000 | 17472.50 | 8215.00 | 30077.45 | 4043.00 | 61840.00 | 12 | 100 | 1 | 8 | 110000 | 10 | 83 | 7700 | 11 | 92 | 3000 |
| METALS | Antimony | SE | 12 | mg/kg | <0.3 | 2.6 | n.d. | n.d. | n.d. | n.d. | 2.60 | 1 | 8 | 0 | 0 | 47 | 0 | 0 | 3.1 | 1 | 8 | 0.035 |
| METALS | Arsenic | SE | 12 | mg/kg | <0.65 | 26.4 | 5.26 | 3.00 | 7.05 | n.d. | 17.00 | 11 | 92 | 6 | 50 | 3 | 11 | 92 | 0.68 | 11 | 92 | 0.0015 |
| METALS | Barium | SE | 12 | mg/kg | 80.8 | 758 | 302.98 | 169.00 | 221.31 | 106.76 | 642.50 | 12 | 100 | 0.00 | 0 | 22000 | 0 | 0 | 1500 | 12 | 100 | 16 |
| METALS | Beryllium | SE | 12 | mg/kg | <0.2 | 4.5 | 0.81 | 0.42 | 1.23 | n.d. | 3.20 | 11 | 92 | 0.00 | 0 | 230 | 0 | 0 | 16 | 1 | 8 | 1.9 |
| METALS | Cadmium | SE | 12 | mg/kg | <0.32 | 8 | 0.89 | n.d. | 2.37 | n.d. | 7.74 | 2 | 17 | 0 | 0 | 98 | 1 | 8 | 7.1 | 2 | 17 | 0.069 |
| METALS | Calcium | SE | 12 | mg/kg | 11800 | 273000 | 69075.00 | 21900.00 | 83634.20 | 12900.00 | 214150.00 | 12 | 100 | - | - | - | - | - | - | - | - | - |
| METALS | Chromium | SE | 12 | mg/kg | 3.3 | 53 | 15.02 | 9.50 | 15.51 | 5.72 | 47.12 | 12 | 100 | - | - | - | - | - | - | - | - | - |
| METALS | Cobalt | SE | 12 | mg/kg | 1.4 | 18.5 | 5.28 | 4.90 | 4.41 | 1.40 | 11.35 | 12 | 100 | 0 | 0 | 35 | 10 | 83 | 2.3 | 12 | 100 | 0.027 |
| METALS | Copper | SE | 12 | mg/kg | 9.4 | 83.6 | 31.39 | 13.70 | 27.34 | 10.94 | 81.13 | 12 | 100 | 0 | 0 | 4700 | 0 | 0 | 310 | 12 | 100 | 2.8 |
| METALS | Cyanide, Total | SE | 12 | mg/kg | <0.032 | 7.8 | 1.37 | 0.28 | 2.24 | n.d. | 5.50 | 11 | 92 | 0 | 0 | 15 | 2 | 17 | 2.3 | 11 | 92 | 0.0015 |
| METALS | Iron | SE | 12 | mg/kg | 1490 | 15200 | 9028.33 | 9220.00 | 4691.73 | 2111.50 | 14650.00 | 12 | 100 | 0 | 0 | 82000 | 9 | 75 | 5500 | 12 | 100 | 35 |
| METALS | Lead | SE | 12 | mg/kg | 5.6 | 109 | 18.07 | 8.25 | 29.18 | 5.71 | 62.69 | 12 | 100 | 0 | 0 | 800 | 0 | 0 | 400 | - | - | - |
| METALS | Magnesium | SE | 12 | mg/kg | 2660 | 9890 | 6905.00 | 6860.00 | 2722.14 | 3105.50 | 9796.50 | 12 | 100 | - | - | - | - | - | - | - | - | - |
| METALS | Manganese | SE | 12 | mg/kg | 24.8 | 302 | 161.47 | 155.50 | 110.12 | 26.29 | 293.20 | 12 | 100 | 0 | 0 | 2600 | 5 | 42 | 180 | 12 | 100 | 2.8 |
| METALS | Mercury | SE | 12 | mg/kg | <0.013 | 0.11 | 0.04 | 0.03 | 0.03 | n.d. | 0.11 | 11 | 92 | 0 | 0 | 4.6 | 0 | 0 | 1.1 | 11 | 92 | 0.0033 |
| METALS | Nickel | SE | 12 | mg/kg | 5.4 | 771 | 89.86 | 10.95 | 221.95 | 6.23 | 461.35 | 12 | 100 | 0 | 0 | 2200 | 2 | 17 | 150 | 12 | 100 | 2.6 |
| METALS | Potassium | SE | 12 | mg/kg | 272 | 1150 | 737.50 | 730.50 | 281.05 | 315.45 | 1111.50 | 12 | 100 | - | - | - | - | - | - | - | - | - |
| METALS | Selenium | SE | 12 | mg/kg | <0.28 | 3.4 | 0.41 | n.d. | 0.99 | n.d. | 3.15 | 3 | 25 | 0 | 0 | 580 | 0 | 0 | 39 | 3 | 25 | 0.052 |
| METALS | Silver | SE | 12 | mg/kg | <0.59 | 1 | n.d. | n.d. | n.d. | n.d. | 1.00 | 1 | 8 | 0 | 0 | 580 | 0 | 0 | 39 | 1 | 8 | 0.08 |
| METALS | Sodium | SE | 12 | mg/kg | <40.8 | 840 | 207.31 | 148.00 | 228.72 | n.d. | 646.50 | 10 | 83 | - | - | - | - | - | - | - | - | - |
| METALS | Thallium | SE | 12 | mg/kg | <0.12 | 1.2 | 0.12 | n.d. | 0.35 | n.d. | 1.15 | 2 | 17 | 0 | 0 | 1.2 | 2 | 17 | 0.078 | 2 | 17 | 0.0014 |
| METALS | Vanadium | SE | 12 | mg/kg | 2.3 | 233 | 33.31 | 11.20 | 65.20 | 3.57 | 141.21 | 12 | 100 | 0.00 | 0 | 580 | 2 | 17 | 39 | 7 | 58 | 8.6 |
| METALS | Zinc | SE | 12 | mg/kg | 37.3 | 871 | 141.88 | 47.90 | 245.74 | 37.91 | 583.90 | 12 | 100 | 0 | 0 | 35000 | 0 | 0 | 2300 | 12 | 100 | 37 |
| OC_PEST | 4,4'-DDD | SE | 12 | mg/kg | <0.0011 | <0.0029 | n.d. | n.d. | n.d. | n.d. | n.d. | 0 | 0 | 0.00 | 0 | 9.6 | 0 | 0 | 2.3 | 0 | 0 | 0.0075 |
| OC_PEST | 4,4'-DDE | SE | 12 | mg/kg | <0.0012 | <0.0032 | n.d. | n.d. | n.d. | n.d. | n.d. | 0 | 0 | 0.00 | 0 | 9.3 | 0 | 0 | 2 | 0 | 0 | 0.011 |
| OC_PEST | 4,4'-DDT | SE | 12 | mg/kg | <0.00083 | <0.0023 | n.d. | n.d. | n.d. | n.d. | n.d. | 0 | 0 | 0 | 0 | 8.5 | 0 | 0 | 1.9 | 0 | 0 | 0.077 |
| OC_PEST | Aldrin | SE | 12 | mg/kg | <0.00098 | <0.0027 | n.d. | n.d. | n.d. | n.d. | n.d. | 0 | 0 | 0.00 | 0 | 0.18 | 0 | 0 | 0.039 | 0 | 0 | 0.00015 |
| OC_PEST | alpha-BHC | SE | 12 | mg/kg | <0.00074 | <0.002 | n.d. | n.d. | n.d. | n.d. | n.d. | 0 | 0 | 0 | 0 | 0.36 | 0 | 0 | 0.086 | 0 | 0 | 0.000042 |
| OC_PEST | alpha-Chlordane | SE | 12 | mg/kg | <0.0013 | <0.0036 | n.d. | n.d. | n.d. | n.d. | n.d. | 0 | 0 | - | - | - | - | - | - | - | - | - |
| OC_PEST | beta-BHC | SE | 12 | mg/kg | <0.00079 | <0.0022 | n.d. | n.d. | n.d. | n.d. | n.d. | 0 | 0 | 0 | 0 | 1.3 | 0 | 0 | 0.3 | 0 | 0 | 0.00015 |
| OC_PEST | delta-BHC | SE | 12 | mg/kg | <0.00088 | <0.0024 | n.d. | n.d. | n.d. | n.d. | n.d. | 0 | 0 | - | - | - | - | - | - | - | - | - |
| OC_PEST | Dieldrin | SE | 12 | mg/kg | <0.0011 | <0.0029 | n.d. | n.d. | n.d. | n.d. | n.d. | 0 | 0 | 0.00 | 0 | 0.14 | 0 | 0 | 0.034 | 0 | 0 | 0.000071 |
| OC_PEST | Endosulfan I | SE | 12 | mg/kg | <0.0011 | <0.0031 | n.d. | n.d. | n.d. | n.d. | n.d. | 0 | 0 | - | - | - | - | - | - | - | - | - |
| OC_PEST | Endosulfan II | SE | 12 | mg/kg | <0.0013 | <0.0035 | n.d. | n.d. | n.d. | n.d. | n.d. | 0 | 0 | - | - | - | - | - | - | - | - | - |
| OC_PEST | Endosulfan sulfate | SE | 12 | mg/kg | <0.00094 | <0.0026 | n.d. | n.d. | n.d. | n.d. | n.d. | 0 | 0 | - | - | - | - | - | - | - | - | - |

**Table 24. Sediment Analytical Results Statistical Summary**
**Columbia Falls Aluminum Company, LLC, Phase I Site Characterization, 2000 Aluminum Drive, Columbia Falls, MT**

| | | | | | | | | | | | | | | Industrial RSL | | | Residential RSL | | | Risk SSL | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Group | Analyte | Matrix | No. of Results | Unit | Min | Max | Mean | Median | Standard Deviation | 5th Percentile | 95th Percentile | # > LOD | % > LOD | No. Exceeding | % Exceeding | Action Level | No. Exceeding | % Exceeding | Action Level | No. Exceeding | % Exceeding | Action Level |
| OC_PEST | Endrin | SE | 12 | mg/kg | <0.001 | <0.0028 | n.d. | n.d. | n.d. | n.d. | n.d. | 0 | 0 | 0.00 | 0 | 25 | 0 | 0 | 1.9 | 0 | 0 | 0.0092 |
| OC_PEST | Endrin aldehyde | SE | 12 | mg/kg | <0.001 | <0.0028 | n.d. | n.d. | n.d. | n.d. | n.d. | 0 | 0 | - | - | - | - | - | - | - | - | - |
| OC_PEST | Endrin ketone | SE | 12 | mg/kg | <0.0011 | <0.0031 | n.d. | n.d. | n.d. | n.d. | n.d. | 0 | 0 | - | - | - | - | - | - | - | - | - |
| OC_PEST | gamma-BHC (Lindane) | SE | 12 | mg/kg | <0.00072 | <0.002 | n.d. | n.d. | n.d. | n.d. | n.d. | 0 | 0 | 0 | 0 | 2.5 | 0 | 0 | 0.57 | 0 | 0 | 0.00024 |
| OC_PEST | gamma-Chlordane | SE | 12 | mg/kg | <0.0018 | <0.0049 | n.d. | n.d. | n.d. | n.d. | n.d. | 0 | 0 | - | - | - | - | - | - | - | - | - |
| OC_PEST | Heptachlor | SE | 12 | mg/kg | <0.001 | <0.0029 | n.d. | n.d. | n.d. | n.d. | n.d. | 0 | 0 | 0 | 0 | 0.63 | 0 | 0 | 0.13 | 0 | 0 | 0.00012 |
| OC_PEST | Heptachlor epoxide | SE | 12 | mg/kg | <0.0016 | <0.0044 | n.d. | n.d. | n.d. | n.d. | n.d. | 0 | 0 | 0 | 0 | 0.33 | 0 | 0 | 0.07 | 0 | 0 | 0.000028 |
| OC_PEST | Methoxychlor | SE | 12 | mg/kg | <0.0017 | <0.0048 | n.d. | n.d. | n.d. | n.d. | n.d. | 0 | 0 | 0 | 0 | 410 | 0 | 0 | 32 | 0 | 0 | 0.2 |
| OC_PEST | Toxaphene | SE | 12 | mg/kg | <0.024 | <0.065 | n.d. | n.d. | n.d. | n.d. | n.d. | 0 | 0 | 0.00 | 0 | 2.1 | 0 | 0 | 0.49 | 0 | 0 | 0.011 |
| PCB | Aroclor 1016 | SE | 12 | mg/kg | <0.011 | <0.03 | n.d. | n.d. | n.d. | n.d. | n.d. | 0 | 0 | 0.00 | 0 | 5.1 | 0 | 0 | 0.41 | 0 | 0 | 0.013 |
| PCB | Aroclor 1221 | SE | 12 | mg/kg | <0.011 | <0.03 | n.d. | n.d. | n.d. | n.d. | n.d. | 0 | 0 | 0 | 0 | 0.83 | 0 | 0 | 0.2 | 0 | 0 | 0.00008 |
| PCB | Aroclor 1232 | SE | 12 | mg/kg | <0.011 | <0.03 | n.d. | n.d. | n.d. | n.d. | n.d. | 0 | 0 | 0 | 0 | 0.72 | 0 | 0 | 0.17 | 0 | 0 | 0.00008 |
| PCB | Aroclor 1242 | SE | 12 | mg/kg | <0.011 | <0.03 | n.d. | n.d. | n.d. | n.d. | n.d. | 0 | 0 | 0 | 0 | 0.95 | 0 | 0 | 0.23 | 0 | 0 | 0.0012 |
| PCB | Aroclor 1248 | SE | 12 | mg/kg | <0.011 | <0.03 | n.d. | n.d. | n.d. | n.d. | n.d. | 0 | 0 | 0 | 0 | 0.95 | 0 | 0 | 0.23 | 0 | 0 | 0.0012 |
| PCB | Aroclor 1254 | SE | 12 | mg/kg | <0.011 | <0.031 | n.d. | n.d. | n.d. | n.d. | n.d. | 0 | 0 | 0 | 0 | 0.97 | 0 | 0 | 0.12 | 0 | 0 | 0.002 |
| PCB | Aroclor 1260 | SE | 12 | mg/kg | <0.011 | <0.031 | n.d. | n.d. | n.d. | n.d. | n.d. | 0 | 0 | 0 | 0 | 0.99 | 0 | 0 | 0.24 | 0 | 0 | 0.0055 |
| PCB | Aroclor 1268 | SE | 12 | mg/kg | <0.011 | <0.031 | n.d. | n.d. | n.d. | n.d. | n.d. | 0 | 0 | - | - | - | - | - | - | - | - | - |
| PCB | Aroclor-1262 | SE | 12 | mg/kg | <0.011 | <0.031 | n.d. | n.d. | n.d. | n.d. | n.d. | 0 | 0 | - | - | - | - | - | - | - | - | - |
| PCB | Polychlorinated biphenyls, Total | SE | 12 | mg/kg | <0.011 | <0.031 | n.d. | n.d. | n.d. | n.d. | n.d. | 0 | 0 | 0 | 0 | 0.94 | 0 | 0 | 0.23 | 0 | 0 | 0.0068 |
| SVOC | 1,1'-Biphenyl | SE | 12 | mg/kg | <0.034 | <0.87 | n.d. | n.d. | n.d. | n.d. | n.d. | 0 | 0 | 0 | 0 | 20 | 0 | 0 | 4.7 | 0 | 0 | 0.00087 |
| SVOC | 1,2,4,5-Tetrachlorobenzene | SE | 12 | mg/kg | <0.03 | <0.76 | n.d. | n.d. | n.d. | n.d. | n.d. | 0 | 0 | 0 | 0 | 35 | 0 | 0 | 2.3 | 0 | 0 | 0.00079 |
| SVOC | 1,4-Dioxane | SE | 12 | mg/kg | <0.11 | <2.7 | n.d. | n.d. | n.d. | n.d. | n.d. | 0 | 0 | 0 | 0 | 24 | 0 | 0 | 5.3 | 0 | 0 | 0.000094 |
| SVOC | 2,2'-oxybis[1-chloropropane] | SE | 12 | mg/kg | <0.016 | <0.42 | n.d. | n.d. | n.d. | n.d. | n.d. | 0 | 0 | 0 | 0 | 4700 | 0 | 0 | 310 | 0 | 0 | 0.026 |
| SVOC | 2,3,4,6-Tetrachlorophenol | SE | 12 | mg/kg | <0.037 | <0.96 | n.d. | n.d. | n.d. | n.d. | n.d. | 0 | 0 | 0.00 | 0 | 2500 | 0 | 0 | 190 | 0 | 0 | 0.018 |
| SVOC | 2,4,5-Trichlorophenol | SE | 12 | mg/kg | <0.04 | <1 | n.d. | n.d. | n.d. | n.d. | n.d. | 0 | 0 | 0 | 0 | 8200 | 0 | 0 | 630 | 0 | 0 | 0.4 |
| SVOC | 2,4,6-Trichlorophenol | SE | 12 | mg/kg | <0.011 | <0.29 | n.d. | n.d. | n.d. | n.d. | n.d. | 0 | 0 | 0.00 | 0 | 82 | 0 | 0 | 6.3 | 0 | 0 | 0.0012 |
| SVOC | 2,4-Dichlorophenol | SE | 12 | mg/kg | <0.0094 | <0.24 | n.d. | n.d. | n.d. | n.d. | n.d. | 0 | 0 | 0 | 0 | 250 | 0 | 0 | 19 | 0 | 0 | 0.0023 |
| SVOC | 2,4-Dimethylphenol | SE | 12 | mg/kg | <0.088 | <2.2 | n.d. | n.d. | n.d. | n.d. | n.d. | 0 | 0 | 0 | 0 | 1600 | 0 | 0 | 130 | 0 | 0 | 0.042 |
| SVOC | 2,4-Dinitrophenol | SE | 12 | mg/kg | <0.3 | <7.7 | n.d. | n.d. | n.d. | n.d. | n.d. | 0 | 0 | 0 | 0 | 160 | 0 | 0 | 13 | 0 | 0 | 0.0044 |
| SVOC | 2,4-Dinitrotoluene | SE | 12 | mg/kg | <0.016 | <0.4 | n.d. | n.d. | n.d. | n.d. | n.d. | 0 | 0 | 0 | 0 | 7.4 | 0 | 0 | 1.7 | 0 | 0 | 0.00032 |
| SVOC | 2,6-Dinitrotoluene | SE | 12 | mg/kg | <0.021 | <0.54 | n.d. | n.d. | n.d. | n.d. | n.d. | 0 | 0 | 0 | 0 | 1.5 | 0 | 0 | 0.36 | 0 | 0 | 0.000067 |
| SVOC | 2-Chloronaphthalene | SE | 12 | mg/kg | <0.009 | <0.23 | n.d. | n.d. | n.d. | n.d. | n.d. | 0 | 0 | 0 | 0 | 6000 | 0 | 0 | 480 | 0 | 0 | 0.39 |
| SVOC | 2-Chlorophenol | SE | 12 | mg/kg | <0.01 | <0.26 | n.d. | n.d. | n.d. | n.d. | n.d. | 0 | 0 | 0 | 0 | 580 | 0 | 0 | 39 | 0 | 0 | 0.0089 |
| SVOC | 2-Methylnaphthalene | SE | 12 | mg/kg | <0.0088 | 0.52 | 0.05 | n.d. | 0.15 | n.d. | 0.50 | 2 | 17 | 0 | 0 | 300 | 0 | 0 | 24 | 2 | 17 | 0.019 |
| SVOC | 2-Methylphenol | SE | 12 | mg/kg | <0.017 | <0.44 | n.d. | n.d. | n.d. | n.d. | n.d. | 0 | 0 | 0 | 0 | 4100 | 0 | 0 | 320 | 0 | 0 | 0.075 |
| SVOC | 2-Nitroaniline | SE | 12 | mg/kg | <0.013 | <0.34 | n.d. | n.d. | n.d. | n.d. | n.d. | 0 | 0 | 0 | 0 | 800 | 0 | 0 | 63 | 0 | 0 | 0.008 |
| SVOC | 2-Nitrophenol | SE | 12 | mg/kg | <0.013 | <0.34 | n.d. | n.d. | n.d. | n.d. | n.d. | 0 | 0 | - | - | - | - | - | - | - | - | - |
| SVOC | 3 & 4 Methylphenol | SE | 12 | mg/kg | <0.011 | 0.49 | 0.06 | n.d. | 0.15 | n.d. | 0.48 | 2 | 17 | - | - | - | - | - | - | - | - | - |

**Table 24. Sediment Analytical Results Statistical Summary**
**Columbia Falls Aluminum Company, LLC, Phase I Site Characterization, 2000 Aluminum Drive, Columbia Falls, MT**

| | | | | | | | | | | | | | | Industrial RSL | | | Residential RSL | | | Risk SSL | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Group | Analyte | Matrix | No. of Results | Unit | Min | Max | Mean | Median | Standard Deviation | 5th Percentile | 95th Percentile | # > LOD | % > LOD | No. Exceeding | % Exceeding | Action Level | No. Exceeding | % Exceeding | Action Level | No. Exceeding | % Exceeding | Action Level |
| SVOC | 3,3'-Dichlorobenzidine | SE | 12 | mg/kg | <0.044 | <1.1 | n.d. | n.d. | n.d. | n.d. | n.d. | 0 | 0 | 0 | 0 | 5.1 | 0 | 0 | 1.2 | 0 | 0 | 0.00082 |
| SVOC | 3-Nitroaniline | SE | 12 | mg/kg | <0.012 | <0.3 | n.d. | n.d. | n.d. | n.d. | n.d. | 0 | 0 | - | - | - | - | - | - | - | - | - |
| SVOC | 4,6-Dinitro-2-methylphenol | SE | 12 | mg/kg | <0.11 | <2.7 | n.d. | n.d. | n.d. | n.d. | n.d. | 0 | 0 | 0 | 0 | 6.6 | 0 | 0 | 0.51 | 0 | 0 | 0.00026 |
| SVOC | 4-Bromophenyl phenyl ether | SE | 12 | mg/kg | <0.013 | <0.32 | n.d. | n.d. | n.d. | n.d. | n.d. | 0 | 0 | - | - | - | - | - | - | - | - | - |
| SVOC | 4-Chloro-3-methylphenol | SE | 12 | mg/kg | <0.017 | <0.44 | n.d. | n.d. | n.d. | n.d. | n.d. | 0 | 0 | 0 | 0 | 8200 | 0 | 0 | 630 | 0 | 0 | 0.17 |
| SVOC | 4-Chloroaniline | SE | 12 | mg/kg | <0.01 | 0.13 | n.d. | n.d. | n.d. | n.d. | 0.13 | 1 | 8 | 0 | 0 | 11 | 0 | 0 | 2.7 | 1 | 8 | 0.00016 |
| SVOC | 4-Chlorophenyl phenyl ether | SE | 12 | mg/kg | <0.012 | <0.3 | n.d. | n.d. | n.d. | n.d. | n.d. | 0 | 0 | - | - | - | - | - | - | - | - | - |
| SVOC | 4-Nitroaniline | SE | 12 | mg/kg | <0.015 | <0.38 | n.d. | n.d. | n.d. | n.d. | n.d. | 0 | 0 | 0.00 | 0 | 110 | 0 | 0 | 25 | 0 | 0 | 0.0016 |
| SVOC | 4-Nitrophenol | SE | 12 | mg/kg | <0.19 | <4.9 | n.d. | n.d. | n.d. | n.d. | n.d. | 0 | 0 | - | - | - | - | - | - | - | - | - |
| SVOC | Acenaphthene | SE | 12 | mg/kg | <0.0096 | 4.1 | 0.37 | n.d. | 1.18 | n.d. | 3.91 | 2 | 17 | 0 | 0 | 4500 | 0 | 0 | 360 | 1 | 8 | 0.55 |
| SVOC | Acenaphthylene | SE | 12 | mg/kg | <0.01 | 0.086 | n.d. | n.d. | n.d. | n.d. | 0.09 | 1 | 8 | - | - | - | - | - | - | - | - | - |
| SVOC | Acetophenone | SE | 12 | mg/kg | <0.0087 | <0.22 | n.d. | n.d. | n.d. | n.d. | n.d. | 0 | 0 | 0 | 0 | 12000 | 0 | 0 | 780 | 0 | 0 | 0.058 |
| SVOC | Anthracene | SE | 12 | mg/kg | <0.038 | 9.9 | 0.97 | n.d. | 2.86 | n.d. | 9.49 | 2 | 17 | 0 | 0 | 23000 | 0 | 0 | 1800 | 1 | 8 | 5.8 |
| SVOC | Atrazine | SE | 12 | mg/kg | <0.018 | <0.45 | n.d. | n.d. | n.d. | n.d. | n.d. | 0 | 0 | 0 | 0 | 10 | 0 | 0 | 2.4 | 0 | 0 | 0.0002 |
| SVOC | Benzaldehyde | SE | 12 | mg/kg | <0.03 | 0.17 | 0.03 | n.d. | 0.06 | n.d. | 0.17 | 2 | 17 | 0 | 0 | 820 | 0 | 0 | 170 | 2 | 17 | 0.0041 |
| SVOC | Benzo[a]anthracene | SE | 12 | mg/kg | <0.033 | 76 | 7.55 | 0.06 | 21.92 | n.d. | 60.50 | 6 | 50 | 2 | 17 | 2.9 | 3 | 25 | 0.16 | 6 | 50 | 0.0042 |
| SVOC | Benzo[a]pyrene | SE | 12 | mg/kg | <0.012 | 100 | 9.99 | 0.10 | 28.86 | n.d. | 71.65 | 8 | 67 | 2.00 | 17 | 0.29 | 8 | 67 | 0.016 | 8 | 67 | 0.004 |
| SVOC | Benzo[b]fluoranthene | SE | 12 | mg/kg | <0.016 | 210 | 20.95 | 0.20 | 60.63 | n.d. | 159.00 | 7 | 58 | 2 | 17 | 2.9 | 6 | 50 | 0.16 | 7 | 58 | 0.041 |
| SVOC | Benzo[g,h,i]perylene | SE | 12 | mg/kg | <0.023 | 150 | 13.69 | 0.11 | 43.09 | n.d. | 108.90 | 7 | 58 | - | - | - | - | - | - | - | - | - |
| SVOC | Benzo[k]fluoranthene | SE | 12 | mg/kg | <0.017 | 64 | 6.79 | 0.04 | 18.66 | n.d. | 52.25 | 6 | 50 | 1.00 | 8 | 29 | 2 | 17 | 1.6 | 2 | 17 | 0.4 |
| SVOC | Bis(2-chloroethoxy)methane | SE | 12 | mg/kg | <0.012 | <0.32 | n.d. | n.d. | n.d. | n.d. | n.d. | 0 | 0 | 0 | 0 | 250 | 0 | 0 | 19 | 0 | 0 | 0.0013 |
| SVOC | Bis(2-chloroethyl)ether | SE | 12 | mg/kg | <0.0094 | <0.24 | n.d. | n.d. | n.d. | n.d. | n.d. | 0 | 0 | 0.00 | 0 | 1 | 0 | 0 | 0.23 | 0 | 0 | 0.0000036 |
| SVOC | Bis(2-ethylhexyl) phthalate | SE | 12 | mg/kg | <0.016 | 0.18 | 0.02 | n.d. | 0.05 | n.d. | 0.17 | 2 | 17 | 0 | 0 | 160 | 0 | 0 | 39 | 0 | 0 | 1.3 |
| SVOC | Butyl benzyl phthalate | SE | 12 | mg/kg | <0.012 | <0.31 | n.d. | n.d. | n.d. | n.d. | n.d. | 0 | 0 | 0.00 | 0 | 1200 | 0 | 0 | 290 | 0 | 0 | 0.24 |
| SVOC | Caprolactam | SE | 12 | mg/kg | <0.029 | <0.73 | n.d. | n.d. | n.d. | n.d. | n.d. | 0 | 0 | 0 | 0 | 40000 | 0 | 0 | 3100 | 0 | 0 | 0.25 |
| SVOC | Carbazole | SE | 12 | mg/kg | <0.0099 | 9.6 | 0.89 | n.d. | 2.76 | n.d. | 8.31 | 4 | 33 | - | - | - | - | - | - | - | - | - |
| SVOC | Chrysene | SE | 12 | mg/kg | <0.011 | 150 | 14.13 | 0.18 | 43.10 | n.d. | 97.20 | 9 | 75 | 0 | 0 | 290 | 2 | 17 | 16 | 2 | 17 | 1.2 |
| SVOC | Dibenz(a,h)anthracene | SE | 12 | mg/kg | <0.021 | 40 | 3.74 | n.d. | 11.50 | n.d. | 34.72 | 4 | 33 | 2 | 17 | 0.29 | 4 | 33 | 0.016 | 4 | 33 | 0.013 |
| SVOC | Dibenzofuran | SE | 12 | mg/kg | <0.012 | 1.4 | 0.16 | n.d. | 0.42 | n.d. | 1.36 | 2 | 17 | 0 | 0 | 100 | 0 | 0 | 7.3 | 2 | 17 | 0.015 |
| SVOC | Diethyl phthalate | SE | 12 | mg/kg | <0.011 | <0.29 | n.d. | n.d. | n.d. | n.d. | n.d. | 0 | 0 | 0 | 0 | 66000 | 0 | 0 | 5100 | 0 | 0 | 0.61 |
| SVOC | Dimethyl phthalate | SE | 12 | mg/kg | <0.012 | <0.3 | n.d. | n.d. | n.d. | n.d. | n.d. | 0 | 0 | - | - | - | - | - | - | - | - | - |
| SVOC | Di-n-butyl phthalate | SE | 12 | mg/kg | <0.012 | <0.3 | n.d. | n.d. | n.d. | n.d. | n.d. | 0 | 0 | 0 | 0 | 8200 | 0 | 0 | 630 | 0 | 0 | 0.23 |
| SVOC | Di-n-octyl phthalate | SE | 12 | mg/kg | <0.02 | <0.52 | n.d. | n.d. | n.d. | n.d. | n.d. | 0 | 0 | 0 | 0 | 820 | 0 | 0 | 63 | 0 | 0 | 5.7 |
| SVOC | Fluoranthene | SE | 12 | mg/kg | <0.012 | 120 | 11.88 | 0.20 | 34.57 | n.d. | 80.40 | 9 | 75 | 0 | 0 | 3000 | 0 | 0 | 240 | 2 | 17 | 8.9 |
| SVOC | Fluorene | SE | 12 | mg/kg | <0.0087 | 2.1 | 0.18 | n.d. | 0.60 | n.d. | 2.00 | 2 | 17 | 0 | 0 | 3000 | 0 | 0 | 240 | 1 | 8 | 0.54 |
| SVOC | Hexachlorobenzene | SE | 12 | mg/kg | <0.016 | <0.41 | n.d. | n.d. | n.d. | n.d. | n.d. | 0 | 0 | 0 | 0 | 0.96 | 0 | 0 | 0.21 | 0 | 0 | 0.00012 |
| SVOC | Hexachlorobutadiene | SE | 12 | mg/kg | <0.011 | <0.29 | n.d. | n.d. | n.d. | n.d. | n.d. | 0 | 0 | 0 | 0 | 5.3 | 0 | 0 | 1.2 | 0 | 0 | 0.00027 |
| SVOC | Hexachlorocyclopentadiene | SE | 12 | mg/kg | <0.025 | <0.63 | n.d. | n.d. | n.d. | n.d. | n.d. | 0 | 0 | 0 | 0 | 0.75 | 0 | 0 | 0.18 | 0 | 0 | 0.00013 |

**Table 24. Sediment Analytical Results Statistical Summary**
**Columbia Falls Aluminum Company, LLC, Phase I Site Characterization, 2000 Aluminum Drive, Columbia Falls, MT**

| | | | | | | | | | | | | | | Industrial RSL | | | Residential RSL | | | Risk SSL | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Group | Analyte | Matrix | No. of Results | Unit | Min | Max | Mean | Median | Standard Deviation | 5th Percentile | 95th Percentile | # > LOD | % > LOD | No. Exceeding | % Exceeding | Action Level | No. Exceeding | % Exceeding | Action Level | No. Exceeding | % Exceeding | Action Level |
| SVOC | Hexachloroethane | SE | 12 | mg/kg | <0.015 | <0.37 | n.d. | n.d. | n.d. | n.d. | n.d. | 0 | 0 | 0 | 0 | 8 | 0 | 0 | 1.8 | 0 | 0 | 0.0002 |
| SVOC | Indeno[1,2,3-cd]pyrene | SE | 12 | mg/kg | <0.027 | 140 | 13.01 | 0.14 | 40.22 | n.d. | 102.50 | 7 | 58 | 2 | 17 | 2.9 | 6 | 50 | 0.16 | 6 | 50 | 0.13 |
| SVOC | Isophorone | SE | 12 | mg/kg | <0.0086 | 0.078 | 0.01 | n.d. | 0.03 | n.d. | 0.08 | 2 | 17 | 0 | 0 | 2400 | 0 | 0 | 570 | 2 | 17 | 0.026 |
| SVOC | Naphthalene | SE | 12 | mg/kg | <0.01 | 0.89 | 0.11 | n.d. | 0.27 | n.d. | 0.87 | 2 | 17 | 0 | 0 | 17 | 0 | 0 | 3.8 | 2 | 17 | 0.00054 |
| SVOC | Nitrobenzene | SE | 12 | mg/kg | <0.013 | <0.32 | n.d. | n.d. | n.d. | n.d. | n.d. | 0 | 0 | 0.00 | 0 | 22 | 0 | 0 | 5.1 | 0 | 0 | 0.000092 |
| SVOC | N-Nitrosodi-n-propylamine | SE | 12 | mg/kg | <0.013 | <0.34 | n.d. | n.d. | n.d. | n.d. | n.d. | 0 | 0 | 0 | 0 | 0.33 | 0 | 0 | 0.078 | 0 | 0 | 0.0000081 |
| SVOC | N-Nitrosodiphenylamine | SE | 12 | mg/kg | <0.036 | <0.92 | n.d. | n.d. | n.d. | n.d. | n.d. | 0 | 0 | 0 | 0 | 470 | 0 | 0 | 110 | 0 | 0 | 0.067 |
| SVOC | Pentachlorophenol | SE | 12 | mg/kg | <0.048 | <1.2 | n.d. | n.d. | n.d. | n.d. | n.d. | 0 | 0 | 0 | 0 | 4 | 0 | 0 | 1 | 0 | 0 | 0.000057 |
| SVOC | Phenanthrene | SE | 12 | mg/kg | <0.011 | 41 | 3.99 | 0.09 | 11.79 | n.d. | 28.82 | 8 | 67 | - | - | - | - | - | - | - | - | - |
| SVOC | Phenol | SE | 12 | mg/kg | <0.013 | <0.33 | n.d. | n.d. | n.d. | n.d. | n.d. | 0 | 0 | 0 | 0 | 25000 | 0 | 0 | 1900 | 0 | 0 | 0.33 |
| SVOC | Pyrene | SE | 12 | mg/kg | <0.018 | 120 | 11.45 | 0.21 | 34.49 | n.d. | 83.60 | 8 | 67 | 0.00 | 0 | 2300 | 0 | 0 | 180 | 2 | 17 | 1.3 |

mg/kg - Milligrams per Kilograms
n.d - Non Detect
LOD - Limit of Detection
Industiral RSL - Environmental Protection Agency Industrial Soil Regional Screening Level
Residential RSL - Environmental Protection Agency Residnetial Soil Regional Screening Level
Risk SSL - Environmental Protection Agency Human Health Protection of Ground Water - Risk-based Soil Screening Level

# FIGURES

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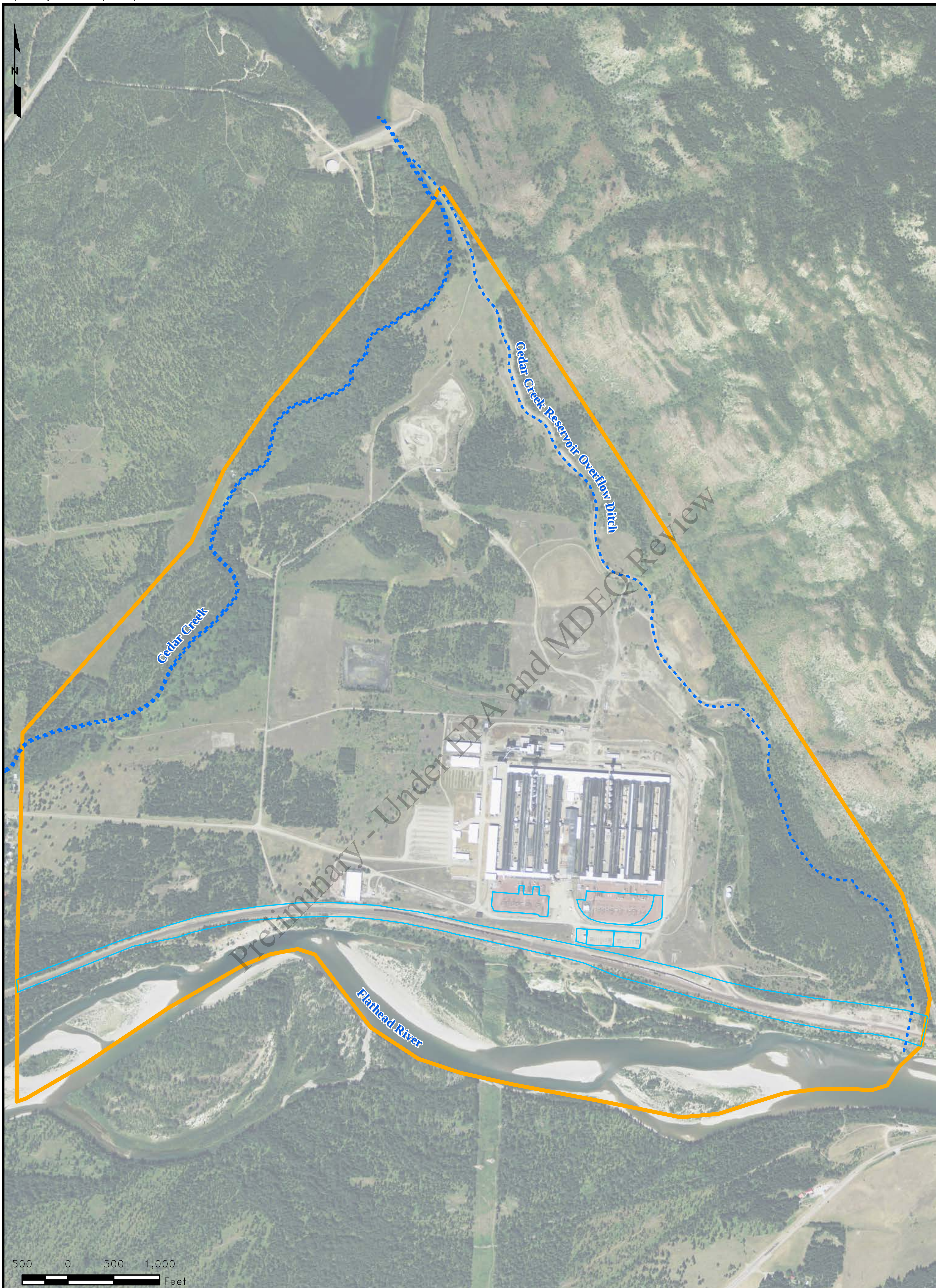



## Legend

- Approximate Third-Party Property Boundaries
- Site Boundary
- Creek Features


Title:

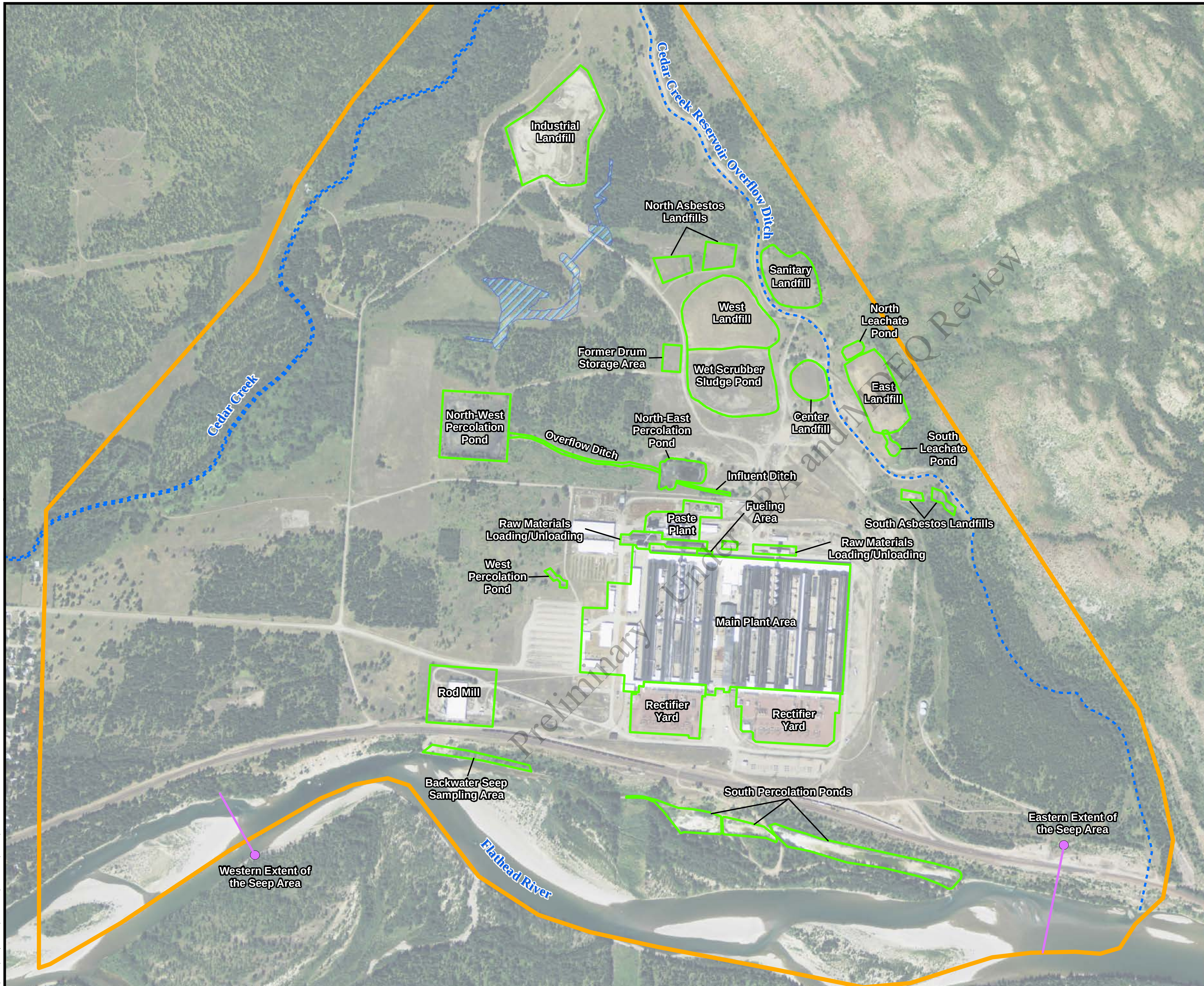
**RI/FS SITE BOUNDARY**

2000 ALUMINUM DRIVE
COLUMBIA FALLS, MONTANA

Prepared For:

COLUMBIA FALLS ALUMINUM COMPANY, LLC

| ROUX ASSOCIATES, INC. Environmental Consulting & Management | Compiled by: M.R. | Date: 20FEB17 | FIGURE |
|---|---|---|---|
| | Prepared by: M.R. | Scale: AS SHOWN | 1 |
| | Project Mgr: M.R. | Project: 2476.0001Y002 | |
| | File: 2476.0001Y142.129.mxd | | |




N

## Legend

- Marker Identifying the Extent of the Seep Area as defined in the MPDES Permit
- Site Features
- Site Boundary
- Creek Features
- Northern Surface Water Feature Extent

850 0 850
Feet

Title:

**SITE FEATURES**

2000 ALUMINUM DRIVE
COLUMBIA FALLS, MONTANA

Prepared For:

COLUMBIA FALLS ALUMINUM COMPANY, LLC

ROUX
ROUX ASSOCIATES, INC.
Environmental Consulting & Management

| | | |
|---|---|---|
| Compiled by: M.R. | Date: 21FEB17 | FIGURE |
| Prepared by: M.R. | Scale: AS SHOWN | 2 |
| Project Mgr: M.R. | Project: 2476.0001Y002 | |
| File: 2476.0001Y142.130.mxd | | |

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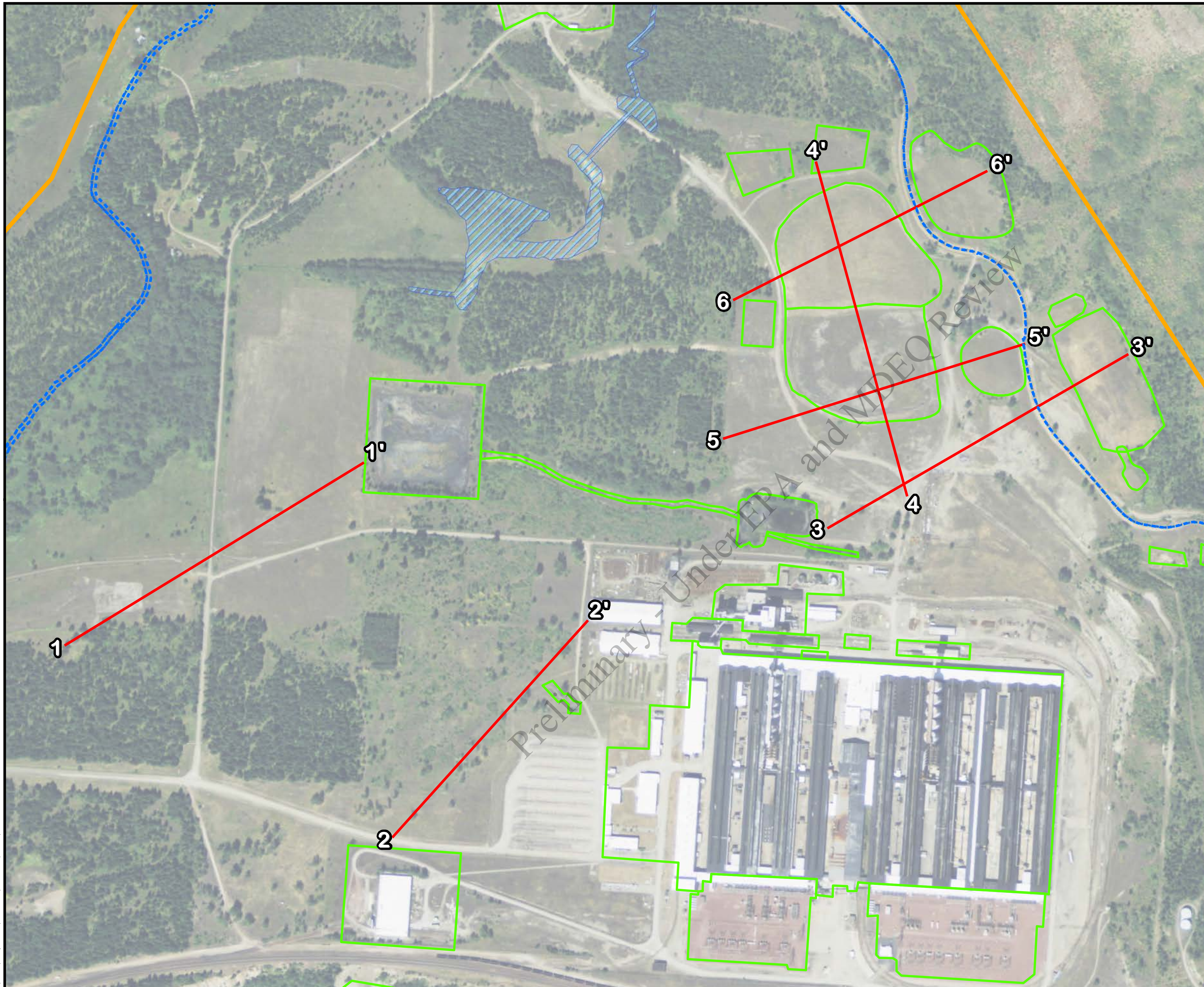



Title: **ER/IP RESISTIVITY SURVEY TRANSECTS**

2000 ALUMINUM DRIVE
COLUMBIA FALLS, MONTANA

Prepared For:
COLUMBIA FALLS ALUMINUM COMPANY, LLC

ROUX
ROUX ASSOCIATES, INC.
Environmental Consulting & Management

| | | |
|---|---|---|
| Compiled by: M.R. | Date: 20FEB17 | FIGURE |
| Prepared by: M.R. | Scale: AS SHOWN | 3 |
| Project Mgr: M.R. | Project: 2476.0001Y002 | |
| File: 2476.0001Y142.131.mxd | | |

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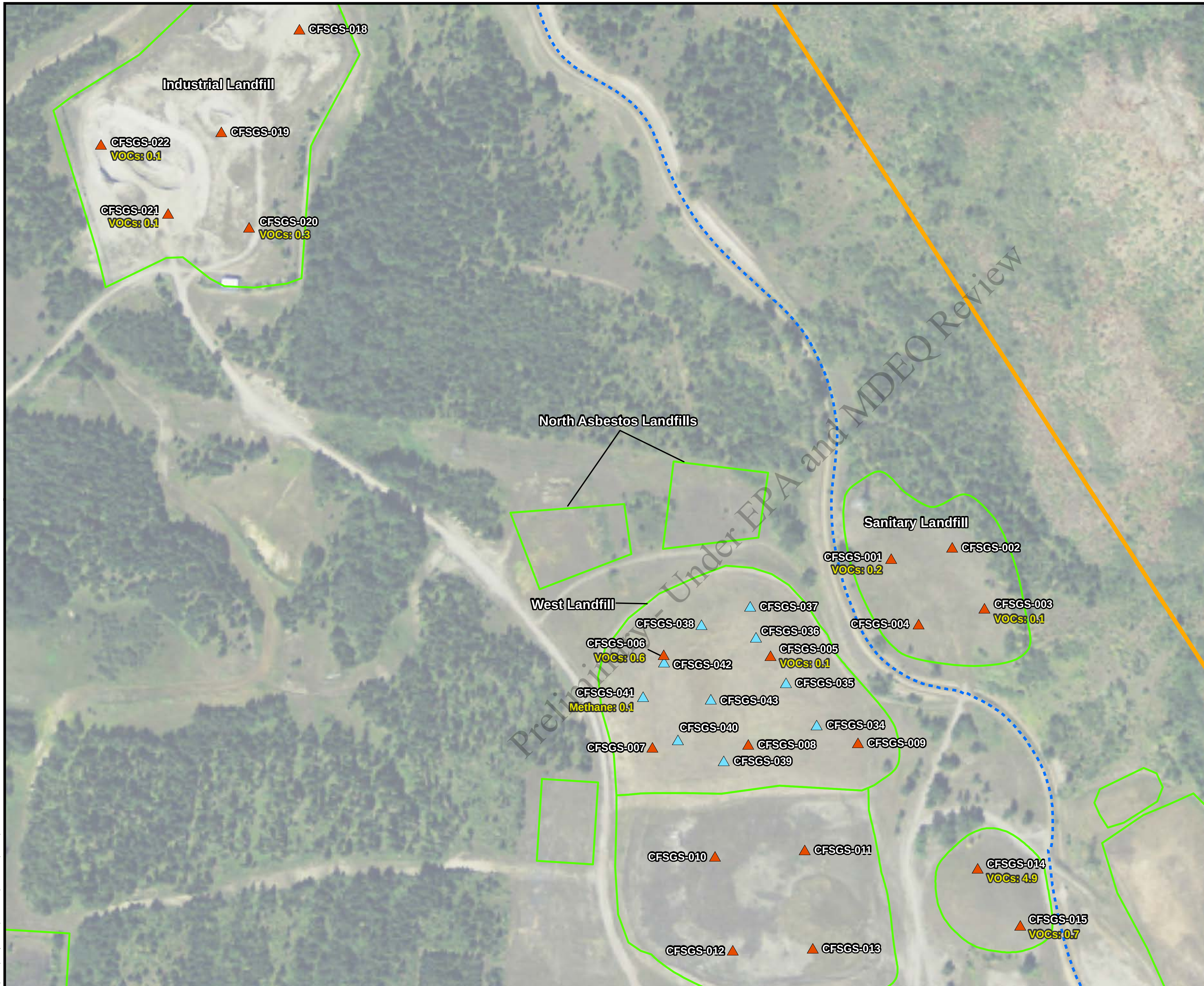


N

## Legend

- ▲ (red) Soil Gas Locations Screened Using Soil Gas Probe
- ▲ (blue) Soil Gas Locations Screened from Existing Landfill Vent
- Site Features
- Site Boundary
- Creek Features

## Key

CFSGS-003 ⟵ Sample Designation
VOCs: 0.1 ⟵ Concentration

## Notes

VOCs – Volatile Organic Compounds
Methane Concentration measured in Percent Lower Explosive Limit (%LEL)
VOCs Concentrations measured in Parts per Million (ppm)
Locations with no concentrations were non-detect for Methane and VOCs

275 0 275 Feet

Title:

**LANDFILL SOIL GAS SCREENING RESULTS**

2000 ALUMINUM DRIVE
COLUMBIA FALLS, MONTANA

Prepared For:
COLUMBIA FALLS ALUMINUM COMPANY, LLC

ROUX
ROUX ASSOCIATES, INC.
Environmental Consulting & Management

| | | |
|---|---|---|
| Compiled by: M.R. | Date: 20FEB17 | FIGURE |
| Prepared by: M.R. | Scale: AS SHOWN | 4 |
| Project Mgr: M.R. | Project: 2476.0001Y002 | |
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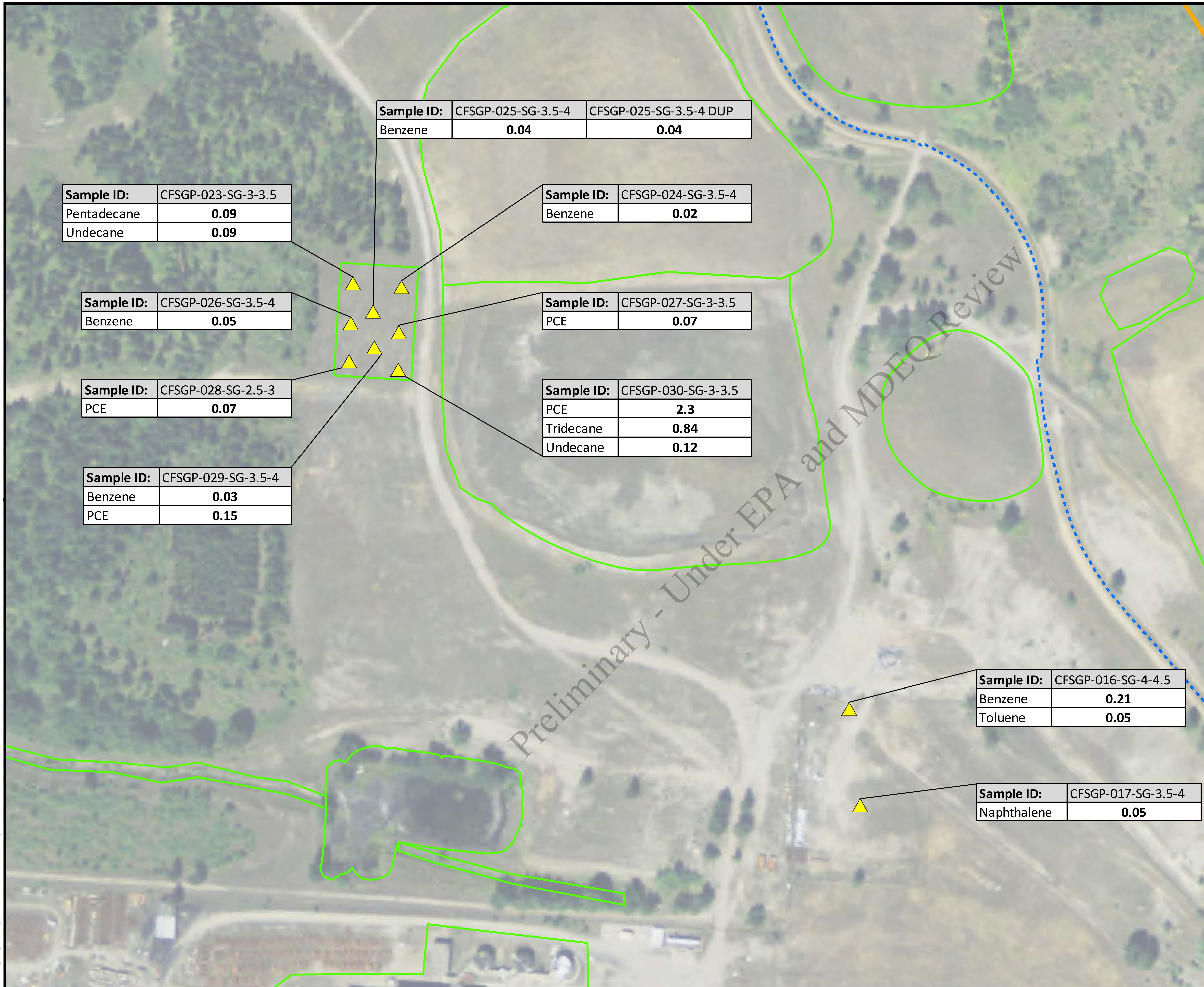


N

## Legend

- Soil Gas Passive Sample Locations
- Site Features
- Site Boundary
- Creek Features

## Key

Sample Designation

| Sample ID: | CFSGP-024-SG-3.5-4 |
|---|---|
| Benzene | 0.02 |

Analyte    Mass

## Notes

PCE – Tetrachloroethylene
Mass detections are displayed in µg
Only analytes with detections are shown

100 0 100 200 Feet

Title:

**AGI PASSIVE SOIL GAS SAMPLING RESULTS**

2000 ALUMINUM DRIVE
COLUMBIA FALLS, MONTANA

Prepared For:
COLUMBIA FALLS ALUMINUM COMPANY, LLC

ROUX
ROUX ASSOCIATES, INC.
Environmental Consulting & Management

| Compiled by: M.R. | Date: 20FEB17 | FIGURE |
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| Prepared by: M.R. | Scale: AS SHOWN | 5 |
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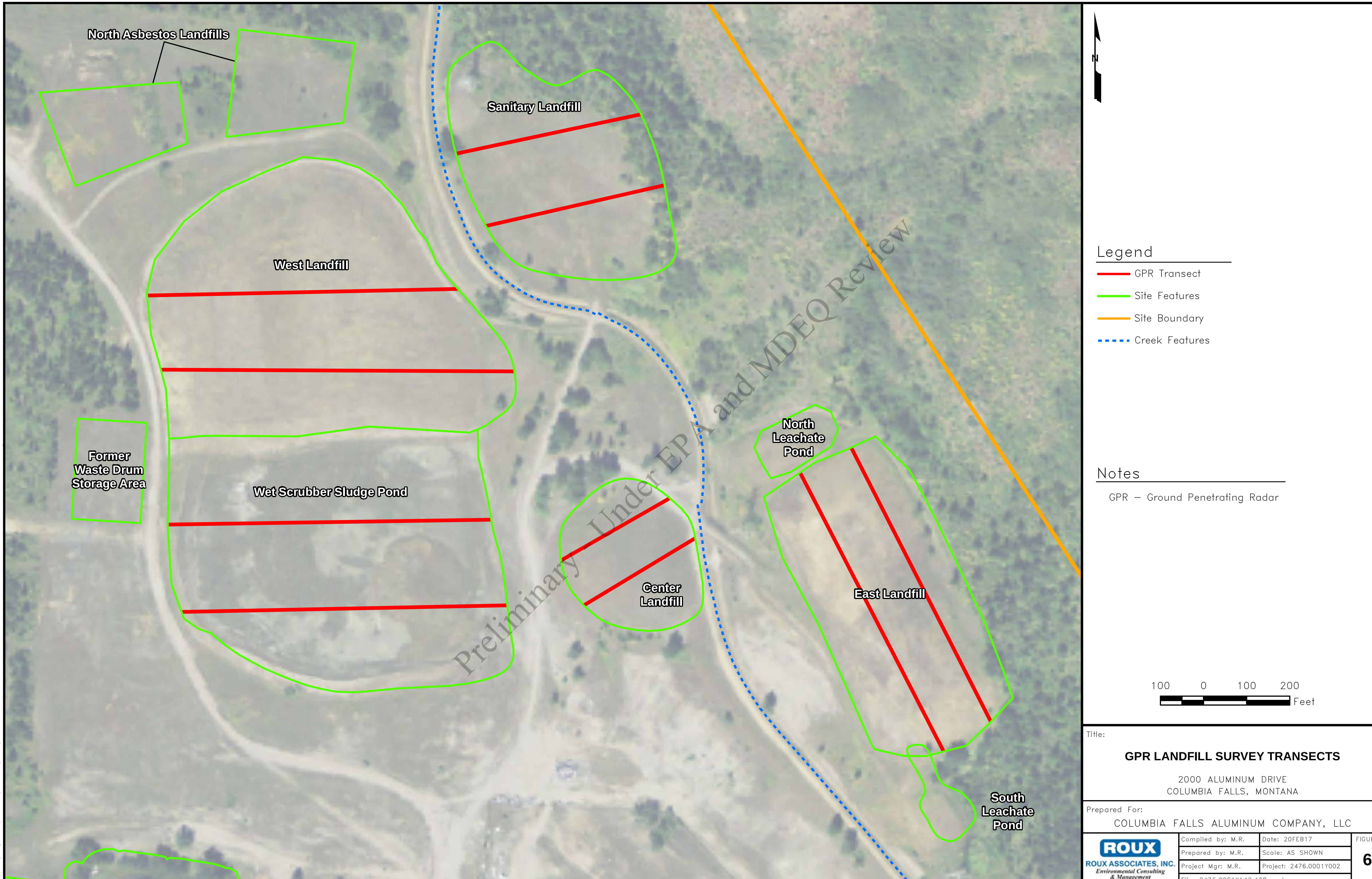


Title:

**GPR LANDFILL SURVEY TRANSECTS**

2000 ALUMINUM DRIVE
COLUMBIA FALLS, MONTANA

Prepared For:
COLUMBIA FALLS ALUMINUM COMPANY, LLC

ROUX
ROUX ASSOCIATES, INC.
Environmental Consulting & Management

| | | |
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| Compiled by: M.R. | Date: 20FEB17 | FIGURE |
| Prepared by: M.R. | Scale: AS SHOWN | 6 |
| Project Mgr: M.R. | Project: 2476.0001Y002 | |
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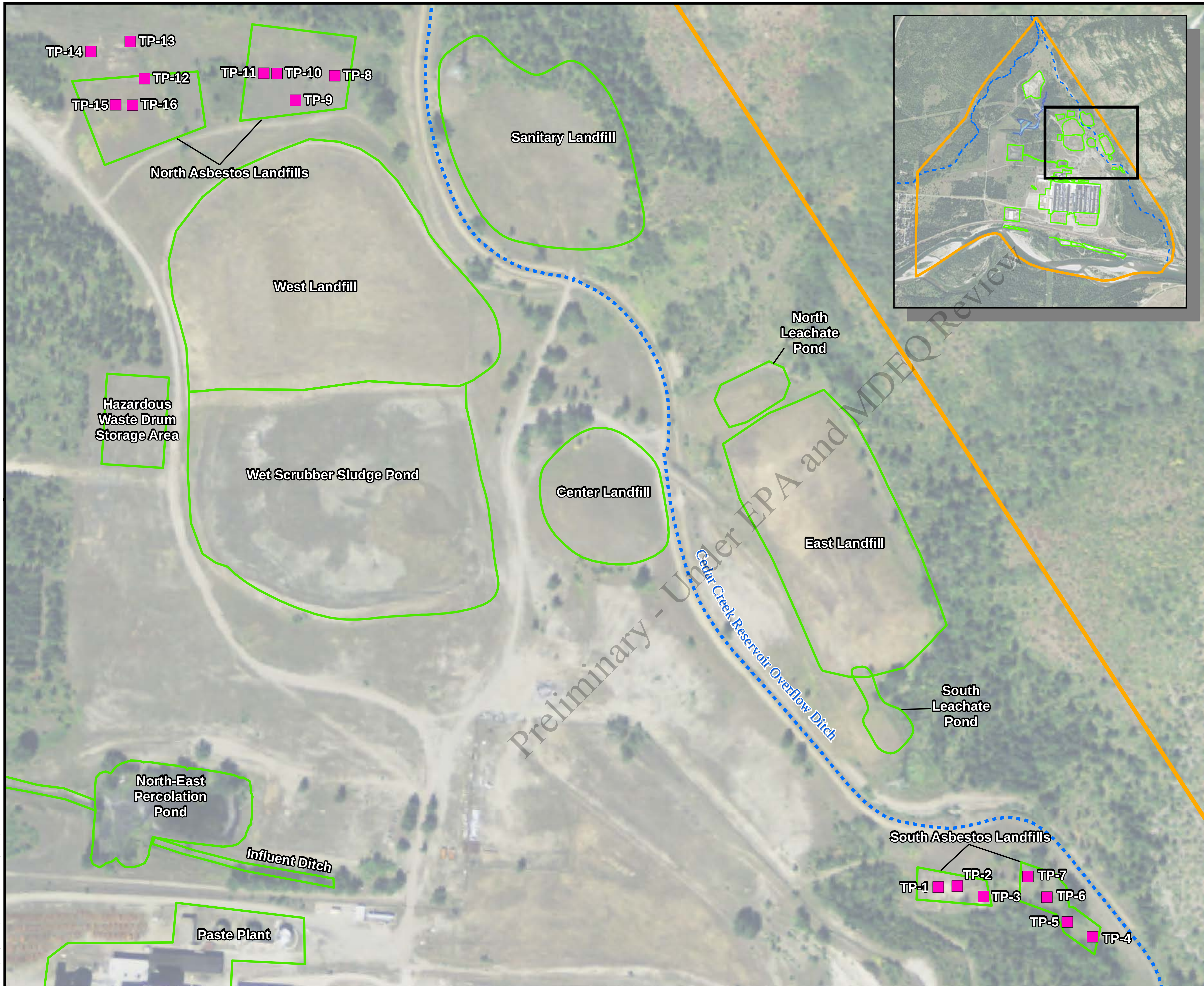




N

## Legend

- Asbestos Test Pit Locations
- Site Features
- Site Boundary
- Creek Features

125 0 125 250 Feet

Title:

**ASBESTOS LANDFILL TEST PIT LOCATIONS**

2000 ALUMINUM DRIVE
COLUMBIA FALLS, MONTANA

Prepared For:

COLUMBIA FALLS ALUMINUM COMPANY, LLC

ROUX
ROUX ASSOCIATES, INC.
*Environmental Consulting & Management*

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# APPENDICES

A. Selected Photographs from Phase 1 Site Characterization Field Activities

B. ER/IP Geophysical Summary Report

C. Field Datasheets

   1. Soil Gas Screening
   2. Drilling and Soil Sampling
   3. Monitoring Well Development
   4. Groundwater Sampling
   5. Surface Water and Sediment Sampling

D. Soil Boring and Monitoring Well Construction Logs

E. Landfill GPR Summary Report

F. Surface Water Discharge Calculations

G. QA/QC Field Audit Forms

H. Data Validation Reports

I. Field Modification Forms

J. FOIA Request Responses

K. Hydrographs from Long Term Pressure Transducer Data

L. Soil Laboratory Analytical Data Tables

   1. VOCs in Soil Samples from Site-wide Soil Boring and Monitoring Well Locations
   2. SVOCs in Soil Samples from Site-wide Soil Boring and Monitoring Well Locations
   3. Metals in Soil Samples from Site-wide Soil Boring and Monitoring Well Locations
   4. PCBs in Soil Samples from Site-wide Soil Boring and Monitoring Well Locations
   5. Pesticides in Soil Samples from Site-wide Soil Boring and Monitoring Well Locations

6. General Chemistry in Soil Samples from Site-wide Soil Boring and Monitoring Well Locations
7. Dioxins and Furans in Soil Samples from Soil Boring and Monitoring Well Locations
8. SVOCs in Incremental Soil Samples
9. Metals in Incremental Soil Samples
10. PCBs in Incremental Soil Samples
11. Pesticides in Incremental Soil Samples
12. General Chemistry in Incremental Soil Samples
13. VOCs in Soil Samples from Drainage Structure Sampling Locations
14. SVOCs in Soil Samples from Drainage Structure Sampling Locations
15. Metals in Soil Samples from Drainage Structure Sampling Locations
16. PCBs in Soil Samples from Drainage Structure Sampling Locations
17. Pesticides in Soil Samples from Drainage Structure Sampling Locations
18. General Chemistry in Soil Samples from Drainage Structure Sampling Locations
19. VOCs in Soil Samples from Background Area Samplings Locations
20. SVOCs in Soil Samples from Background Area Samplings Locations
21. Metals in Soil Samples from Background Area Samplings Locations
22. PCBs in Soil Samples from Background Area Samplings Locations
23. Pesticides in Soil Samples from Background Area Samplings Locations
24. General Chemistry in Soil Samples from Background Area Samplings Locations
25. VOCs in Soil Samples from Borrow Pit Sampling Locations
26. SVOCs in Soil Samples from Borrow Pit Sampling Locations
27. Metals in Soil Samples from Borrow Pit Sampling Locations
28. PCBs in Soil Samples from Borrow Pit Sampling Locations
29. Pesticides in Soil Samples from Borrow Pit Sampling Locations
30. General Chemistry Soil Samples from Borrow Pit Sampling Locations

M. Calculation of Relative Percent Difference (RPD) in Resampled Operational Area Soil Samples

1. SVOC RPD Calculation
2. Metals RPD Calculation
3. PCB RPD Calculation
4. Pesticides RPD Calculation
5. General Chemistry RPD Calculation
6. SVOC RPD Adjusted Value
7. Metals RPD Adjusted Value
8. PCB RPD Adjusted Value
9. Pesticides RPD Adjusted Value
10. General Chemistry RPD Adjusted Value

N. Soil Thematic Maps

1. Concentrations of Cyanide and Fluoride in Soil
2. Concentrations of Selected PAHs in Surface Soil
3. Concentrations of Selected PAHs in Shallow Soil
4. Concentrations of Selected PAHs in Intermediate Depth Soil
5. Concentrations of Selected Metals in Surface Soil
6. Concentrations of Selected Metals in Shallow Soil
7. Concentrations of Selected Metals in Intermediate Depth Soil
8. Concentrations of Cyanide and Fluoride in Incremental Soil Samples from Operational Grid Area
9. Concentrations of Selected PAHs in Incremental Surface Soil Samples from Operational Grid Area
10. Concentrations of Selected PAHs in Incremental Shallow Soil Samples from Operational Grid Area
11. Concentrations of Selected Metals in Incremental Surface Soil Samples from Operational Grid Area

3. Concentrations of Aluminum in Groundwater from Monitoring Wells Screened in Upper Hydrogeologic Unit
4. Concentrations of Arsenic in Groundwater from Monitoring Wells Screened in Upper Hydrogeologic Unit
5. Concentrations of Cobalt in Groundwater from Monitoring Wells Screened in Upper Hydrogeologic Unit
6. Concentrations of Copper in Groundwater from Monitoring Wells Screened in Upper Hydrogeologic Unit
7. Concentrations of Iron in Groundwater from Monitoring Wells Screened in Upper Hydrogeologic Unit
8. Concentrations of Lead in Groundwater from Monitoring Wells Screened in Upper Hydrogeologic Unit
9. Concentrations of Manganese in Groundwater from Monitoring Wells Screened in Upper Hydrogeologic Unit
10. Concentrations of Thallium in Groundwater from Monitoring Wells Screened in Upper Hydrogeologic Unit
11. Concentrations of Ammonia in Groundwater from Monitoring Wells Screened in Upper Hydrogeologic Unit
12. Concentrations of Chloride in Groundwater from Monitoring Wells Screened in Upper Hydrogeologic Unit
13. Concentrations of Calcium Carbonate in Groundwater from Monitoring Wells Screened in Upper Hydrogeologic Unit
14. Concentrations of Nitrate in Groundwater from Monitoring Wells Screened in Upper Hydrogeologic Unit
15. Concentrations of Orthophosphate in Groundwater from Monitoring Wells Screened in Upper Hydrogeologic Unit
16. Concentrations of Sulfate in Groundwater from Monitoring Wells Screened in Upper Hydrogeologic Unit
17. Concentrations of Cyanide in Groundwater from Monitoring Wells Screened Below Upper Hydrogeologic Unit
18. Concentrations of Fluoride in Groundwater from Monitoring Wells Screened Below Upper Hydrogeologic Unit

19. Concentrations of Aluminum in Groundwater from Monitoring Wells Screened Below Upper Hydrogeologic Unit
20. Concentrations of Arsenic in Groundwater from Monitoring Wells Screened Below Upper Hydrogeologic Unit
21. Concentrations of Cobalt in Groundwater from Monitoring Wells Screened Below Upper Hydrogeologic Unit
22. Concentrations of Copper in Groundwater from Monitoring Wells Screened Below Upper Hydrogeologic Unit
23. Concentrations of Iron in Groundwater from Monitoring Wells Screened Below Upper Hydrogeologic Unit
24. Concentrations of Lead in Groundwater from Monitoring Wells Screened Below Upper Hydrogeologic Unit
25. Concentrations of Manganese in Groundwater from Monitoring Wells Screened Below Upper Hydrogeologic Unit
26. Concentrations of Thallium in Groundwater from Monitoring Wells Screened Below Upper Hydrogeologic Unit
27. Concentrations of Ammonia in Groundwater from Monitoring Wells Screened Below Upper Hydrogeologic Unit
28. Concentrations of Chloride in Groundwater from Monitoring Wells Screened Below Upper Hydrogeologic Unit
29. Concentrations of Calcium in Groundwater from Monitoring Wells Screened Below Upper Hydrogeologic Unit
30. Concentrations of Nitrate in Groundwater from Monitoring Wells Screened Below Upper Hydrogeologic Unit
31. Concentrations of Orthophosphate in Groundwater from Monitoring Wells Screened Below Upper Hydrogeologic Unit
32. Concentrations of Sulfate in Groundwater from Monitoring Wells Screened Below Upper Hydrogeologic Unit

W. Surface Water Laboratory Analytical Data Tables

1. VOCs in Surface Water
2. SVOCs in Surface Water
3. Metals in Surface Water

4. PCBs in Surface Water
5. Pesticides in Surface Water
6. General Chemistry in Surface Water

X. Surface Water Thematic Maps

1. Concentrations of Cyanide in Surface Water
2. Concentrations of Fluoride in Surface Water
3. Concentrations of Aluminum in Surface Water
4. Concentrations of Arsenic in Surface Water
5. Concentrations of Cobalt in Surface Water
6. Concentrations of Copper in Surface Water
7. Concentrations of Iron in Surface Water
8. Concentrations of Lead in Surface Water
9. Concentrations of Thallium in Surface Water
10. Concentrations of Manganese in Surface Water

Y. Sediment Laboratory Analytical Data Tables

1. SVOCs in Sediment
2. Metals in Sediment
3. PCBs in Sediment
4. Pesticides in Sediment
5. General Chemistry in Sediment

Z. Sediment Thematic Maps

1. Concentrations of Cyanide and Fluoride in Sediment
2. Concentrations of PAHs in Sediment
3. Concentrations of Selected Metals in Sediment

AA. Investigation Derived Waste Manifests

| Notes Utilized Throughout Tables and Appendices | |
|---|---|
| **DEQ-7 Human Health Standards** | Montana Department of Environmental Quality- DEQ Circular 7 Human Health Standards |
| **EPA** | United States Environmental Protection Agency |
| **EPA Drinking MCL** | United States Environmental Protection Agency Risk Based Screening Level Drinking Water MCL |
| **EPA Tapwater RSL** | United StatesEnvironmental Protection Agency Risk Based Screening Level Tapwater RSL |
| **Industrial RSL** | United States Environmental Protection Agency Industrial Soil Regional Screening Level |
| **Rediential RSL** | United States Environmental Protection Agency Residnetial Soil Regional Screening Level |
| **Risk SSL** | United States Environmental Protection Agency Human Health Protection of Ground Water - Risk-based Soil Screening Level |
| **DUP** | Duplicate sample |
| **ft-bls** | Feet Below Land Surface |
| **ft-btoc** | Feet Below Top of Casing |
| **ft-amsl** | Feet Above Mean Sea Level |
| **LOD** | Limit of Detection |
| **MBSI** | Montana Background Soils Investigation |
| **n.d** | Non Detect |
| **NA** | Compound was not analyzed by laboratory |
| **TEF Value** | Toxic equivalence factors |
| **UCL** | Upper Confidence Limit |
| **UTL** | Upper Tolerance Limit |
| **µg/kg** | Micrograms per Kilograms |
| **g/cc** | Grams per cubic centimeter |
| **mg/kg** | Milligrams per kilogram |
| **% LEL** | % Lower explosive limit |
| **ppm** | Parts per million |
| **pg/g** | Picogram per gram |
| **J-** | Estimated Low Bias |
| **J** | Estimated value |
| **J+** | J+ -Estimated High Bias |
| **R** | Result is Rejected |
| **U** | Indicates that analyte was not detected at the limit reported |