Preassessment Screen:
Anaconda Aluminum Co Columbia Falls Reduction Plant (Columbia Falls Aluminum) Superfund Site
Columbia Falls, Montana

Montana Natural Resource Damage Program
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Contents

Executive Summary

The Anaconda Aluminum Co Columbia Falls Reduction Plant, also known as the Columbia Falls Aluminum Company (CFAC) Plant National Priorities List Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) Site (Site), is located two miles northeast of Columbia Falls in Flathead County, Montana. The former aluminum plant covers approximately 960 acres north of the Flathead River, a fishery that includes the federally designated, threatened bull trout and the federally sensitive westslope cutthroat trout, as well as various habitats (e.g., conifer and riparian forests, deciduous shrubland, and open grassland) for migratory birds. The United States (U.S.) Environmental Protection Agency's (EPA's) initial site evaluation indicates that groundwater and surface water at the site contain various hazardous or deleterious substances[1], including cyanide, fluoride, various other inorganics, and polycyclic aromatic hydrocarbons (PAHs).

The CFAC Plant operated between 1955 and 2009 and created significant quantities of spent potliner material, a federally listed hazardous waste, as a byproduct of the aluminum smelting process. Spent potliner material is known to contain cyanide compounds that can leach into groundwater.

In 1985, CFAC bought the plant from Atlantic Richfield Company, which had acquired the plant from the plant's original owner, Anaconda Company, in 1977.

Regulations outlining a process for conducting a natural resource damage assessment (NRDA)have been promulgated by the U.S. Department of the Interior (DOI) at 43 C.F.R. Part 11.

The Trustees of natural resources for the Site include the State of Montana, the U.S. Department of Interior, acting through the U.S. Fish and Wildlife Service and the Bureau of Indian Affairs, the U.S. Department of Agriculture, and the Confederated Salish and Kootenai Tribes. The Montana Natural Resource Damage Program (NRDP) represents the Governor of the State of Montana, the Trustee for natural resources for the State of Montana.

The Trustees are evaluating whether to proceed with an NRDA for the Site. A Preassessment Screen (PAS) is the first step in the NRDA process based on the CERCLA Natural Resource Damage Assessment and Restoration regulations. The Trustees prepared this PAS to determine whether readily available information suggests that the Trustees can make a successful claim and should proceed with an NRDA for the Site.

This PAS relies heavily on a recent federal court case, *Columbia Falls Aluminum Company, LLC, v. Atlantic Richfield Co*., Case 9:18-cv-00131-DWM (D. Mont. August 25, 2021) (Court Case). In this case, the Court apportioned the liability of the parties under CERCLA and the state law equivalent, the Comprehensive Environmental Cleanup and Responsibility Act (CECRA) after an extensive analysis of the facts.

[1] This PAS uses "hazardous or deleterious substances" to refer to both hazardous substances under CERCLA, 42 U.S.C. §9601(14), and hazardous or deleterious substances under the Comprehensive Environmental Cleanup and Responsibility Act, § 75-10-701(8), MCA.

The purpose of a PAS is to provide a "rapid review of readily available information" to ensure that there is "a reasonable probability of making a successful claim before monies and efforts are expended in carrying out an assessment" [43 C.F.R. § 11.23(b)]. Therefore, the Trustees determined it made sense to rely upon the findings of fact in the Court Case for as much of the PAS as is feasible.

There are five criteria used to determine whether to proceed with an assessment [43 C.F.R. § 11.23(e)], which the Trustees evaluated in this PAS:

1. **A discharge of oil or a release of a hazardous substance has occurred**

   The Trustees have reviewed available data, reports, and literature available for the Site, with a particular reliance on the Court Case, and have confirmed evidence of releases of hazardous substances from historical activities atthe facility.

2. **Natural resources for which the Federal or State agency or Indian Tribe may assert trusteeship under the Comprehensive Environmental Response, Compensation, and Liability Act have been or are likely to have been adversely affected by the discharge or release**

   Based on a review of readily available data and information, the Trustees have concluded that natural resources for which the Trustees may assert trusteeship have been adversely affected by the release of hazardous substances from the facility property. Groundwater, surface water resources (including sediments), terrestrial resources, and biological resources have been exposed to, and adversely affected by, elevated concentrations of cyanide, fluoride, various other inorganics, polycyclic aromatic hydrocarbons, and other hazardous or deleterious substances. Aquatic resources that utilize surface water and sediment as habitat, including fish within the Flathead River and surrounding habitats, have been exposed to and potentially adversely affected by the releases. Floodplain and terrestrial habitats along the Flathead River and migratory birds that use these habitats for breeding are also adversely affected by the releases. Hazardous substances have potentially impacted a number of natural resource and human use services, as well.

3. **The quantity and concentration of the released hazardous substance is sufficient to potentially cause injury, as that term is used in this part, to those natural resources**

   The Trustees have reviewed readily available data, comparing concentrations of hazardous or deleterious substances in groundwater to water quality standards. The data presented in the Remedial Investigation (RI; Roux, 2020) confirmed that concentrations of cyanide, fluoride, arsenic and antimony in groundwater exceed promulgated Federal and/or State groundwater quality criteria, thus confirming a potential injury. The contaminated groundwater is also migrating into the Flathead River and associated floodplain habitats. Similarly, surface water concentrations presented in the RI exceed promulgated Federal and/or State surface water quality criteria for cyanide, aluminum, cadmium, copper, iron, and zinc. Surface water concentrations of fluoride, benzo(a)pyrene, arsenic, and barium also exceed ecological screening values. Hazardous or deleterious substances are present in the soil at levels that may cause injury. Approximately 40 chemicals were identified as contaminants of potential concern (Court Case) and additional review of site data may indicate additional exceedances and injuries to natural resources.

4. **Data sufficient to pursue an assessment are readily available or likely to be obtained at reasonable cost**

   The Trustees have reviewed available sources of data and determined that an assessment can be conducted and additional data can be obtained at a reasonable cost. A Feasibility Study (FS) to support a final remedy decision was approved by the Agencies in June 2021. To the extent that the data collected for the RI/FS does not allow for a complete assessment, the Trustees are prepared to obtain the data required in a cost-efficient manner.

5. **Response actions, if any, carried out or planned, do not or will not sufficiently remedy the injury to natural resources without further action**

   Although the final remedy has not been selected, the U.S. EPA and the Montana Department of Environmental Quality are currently evaluating response actions in the June 2023 proposed plan that are not sufficient to remedy the injury to natural resources without further action. In addition, hazardous or deleterious substance releases and potential natural resource injuries at the Site date back decades, and the Trustees, acting on behalf of the public, are authorized to receive compensation for these interim injuries and service losses.

In summary, based on the five criteria set forth in the CERCLA NRDAR Regulations [43 C.F.R. § 11.23(e)], theTrustees have determined that an assessment of natural resource damages is warranted.

1. Introduction

The Anaconda Aluminum Co. Columbia Falls Reduction Plant, also known as the Columbia Falls Aluminum Company (CFAC) Plant National Priorities List Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) Site (Site), is located two miles northeast of Columbia Falls in Flathead County, Montana. The former aluminum plant covers approximately 960 acres north of the Flathead River; the Site includes anywhere the contamination from the plant operations has come to be located. This includes a fishery that includes the federally designated, threatened bull trout and the federally sensitive westslope cutthroat trout, as well as various habitats (e.g., conifer and riparian forests, deciduous shrubland, and open grassland) for migratory birds. The United States Environmental Protection Agency's (EPA's) initial site evaluation indicates that groundwater and surface water at the site contain various hazardous or deleterious substances[2], including cyanide, fluoride, various other inorganics, and polycyclic aromatic hydrocarbons (PAHs). Historic data indicate that hazardous substances contaminated terrestrial resources on Teakettle Mountain, as well.

The CFAC Plant operated between 1955 and 2009 and created significant quantities of spent potliner material, a federally listed hazardous waste, as a byproduct of the aluminum smelting process. Spent potliner material is known to contain cyanide compounds that can leach into groundwater.

In 1985, CFAC bought the Plant from Atlantic Richfield Company, which had acquired the facility from the Plant's original owner, Anaconda Company, in 1977.

A preliminary assessment (PA) of the Site was performed on March 5, 1984, by Montana Department of Health and Environmental Sciences (MDHES; the predecessor agency to the Montana Department of Environmental Quality [DEQ]). The PA concluded that hazardous wastes generated onsite were spent halogenated and non-halogenated solvents. Solid wastes included spent potliners, basement sweepings, and air-pollution-control dusts.

A site investigation (SI) by Ecology and Environment, Inc. was conducted in 1988 at the request of EPA. The results of the SI indicated that high concentrations of PAHs occurred primarily in soils and sediments and that a release to groundwater and surface water of cyanide had occurred—both of which were attributable to Plant processes. On March 26, 2015, EPA proposed adding the CFAC Site to the National Priorities List, which was finalized on September 9, 2016.

On November 30, 2015, EPA and CFAC signed an Administrative Settlement Agreement and Order on Consent (2015 AOC) to conduct a remedial investigation/feasibility study (RI/FS) to investigate the Site for contamination and look at options for cleanup. Under the terms of the agreement, CFAC conducted a comprehensive investigation of soils, river sediments, and ground and surface water to determine the nature and extent of contamination at the Site. The results of the investigation are helping to determine cleanup needs and identify potential cleanup options at the Site. The RI was

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prepared by Roux Environmental Engineering and Geology, D.P.C. (Roux) and finalized on February 21, 2020 (Roux). In June 2021, EPA approved CFAC's FS, which considers what remedial actions may be needed based on the information gathered in the remedial investigation (Roux, 2021).

As of July 2020, CFAC entered into another Administrative Settlement Agreement and Order on Consent (2020 AOC) with EPA to take early action at the Site to remove sediments from the South Percolation Ponds and to return the flow of the Flathead River to its northern channel. Work began in October 2020 and was completed in March 2021 (CFAC, 2021).

When hazardous substances harm (or "injure") natural resources or resource services that are held in trust for the public, Federal and State laws provide mechanisms that authorize natural resource Trustees to seek compensation from potentially responsible parties (PRPs) for those injuries. Regulations outlining a process for conducting natural resource damage assessments (NRDAs) for the release of hazardous substances have been promulgated by the U.S. Department of the Interior (DOI) at 43 C.F.R. Part 11 (hereafter, the CERCLA Natural Resource Damage Assessment and Restoration [NRDAR] Regulations). These regulations are not mandatory; however,assessments performed in compliance with these regulations have the force of a rebuttable presumption under the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) [42 U.S.C. § 9607(f)(2)(C)].

The Trustees of natural resources for the Site include the State of Montana, the U.S. Department of Interior, acting through the U.S. Fish and Wildlife Service (FWS) and the Bureau of Indian Affairs, the U.S. Department of Agriculture, and the Confederated Salish and Kootenai Tribes. The Montana Natural Resource Damage Program (NRDP) represents the Governor of the State of Montana, the Trustee of natural resources for the State of Montana.

The Trustees are evaluating whether to proceed with an NRDA for the Site. A Preassessment Screen (PAS) is the first step in the NRDA process based on the CERCLA NRDAR Regulations. The Trustees prepared this PAS to determine whether readily available information suggests that the Trustees can make a successful claim and should proceed with anNRDA for the Site.

1.1 Intent of the Preassessment Screen

Subpart B of the CERCLA NRDAR Regulations provide guidelines for conducting a PAS. The purpose of a PAS is to provide "a rapid review of readily available information," focusing on resources for which a Federal, State, or Tribal agency can assert trusteeship, to ensure that there is "a reasonable probability of making a successful claim before monies and efforts are expended in carrying out an assessment" [43 C.F.R. § 11.23(b)]. A PAS is not intended to serve as a complete assessment of natural resource and service injuries or damages. This PAS was prepared using existing data to evaluate whether the Trustees have a reasonable probability of making a successful claim.

This PAS relies heavily on a recent federal court case, *Columbia Falls Aluminum Company, LLC, v. Atlantic Richfield Co*., Case 9:18-cv-00131-DWM (D. Mont. August 25, 2021) (Court Case). In this case, the Court apportioned the liability of the parties under CERCLA and the state law equivalent, the Comprehensive Environmental Cleanup and Responsibility Act (CECRA) after an extensive

analysis of the facts.

1.2 Criteria to be Addressed by the Preassessment Screen

The content and requirements of a PAS include five criteria that are used to evaluate whether to proceed with an assessment [43 C.F.R. § 11.23(e)]:

1. A discharge of oil or a release of a hazardous substance has occurred;
2. Natural resources for which the Federal or State agency or Indian Tribe may assert trusteeship under CERCLA have been or are likely to have been adversely affected by the discharge or release;
3. The quantity and concentration of the discharged oil or released hazardous substance is sufficient to potentially cause injury to those natural resources;
4. Data sufficient to pursue an assessment are readily available or likely to be obtained at reasonable cost; and
5. Response actions, if any, carried out or planned, do not or will not sufficiently remedy the injury to natural resources without further action.

The remainder of this document provides the information to satisfy these criteria, following Subpart B of the CERCLA NRDAR Regulations. Section 2 provides information about the Site and the release of hazardous substances [43 C.F.R. § 11.24]. Section 3 is a preliminary identification of resources potentially at risk [43 C.F.R. § 11.25]. Section 4 documents the determination that all of the PAS criteria have been met, and Section 5 presents the Trustees' determination to proceed with an NRDA for the Site. This is followed by references cited in the text.

1.3 Potentially Responsible Parties

PRPs at the Site include past and current owners and operators of the Site. Atlantic Richfield Co. acquired the Site from Anaconda Company in 1977. In 1985, CFAC purchased the Site from Atlantic Richfield Co. EPA and CFAC have entered into two AOCs, the 2015 AOC, under which CFAC is conducting the RI/FS, and the 2020 AOC for early removal actions. Subsequently, the Court Case apportioned the liability of two PRPs, CFAC and Atlantic Richfield Co., under CERCLA and CECRA in 2021 after an extensive analysis of the facts. The Court Case determined that Atlantic Richfield Co. is responsible for 35% of past and future cleanup costs with the remaining 65% allocated to CFAC.

2. Site History and Hazardous Substance Releases

This section includes Site information and documentation of releases of hazardous substances pursuant to the CERCLA NRDAR Regulations [43 C.F.R. § 11.24]:

- Section 2.1 provides the location and description of the Site [43 C.F.R. § 11.24(a)(4)]
- Section 2.2 describes the operational history and waste disposal at the Site [43 C.F.R. § 11.24(a)(3) and (4)]
- Section 2.3 describes released hazardous substances [43 C.F.R. § 11.24(a)(2);43 C.F.R. § 11.24(a)(5)]
- Section 2.4 summarizes sources of the release of hazardous substances [43 C.F.R. § 11.24(a)(3)]
- Section 2.5 describes time, quantity, duration, and frequency of the hazardous substance releases [43 C.F.R. § 11.24(a)(1)]
- Section 2.6 discusses whether damages being considered are barred by specific defenses or exclusions from liability under CERCLA or the Clean Water Act (CWA) [43 C.F.R. § 11.24(b)].

The PRPs were listed previously in Section 1.3 [43 C.F.R. § 11.24(a)(6)].

2.1 Location and Description

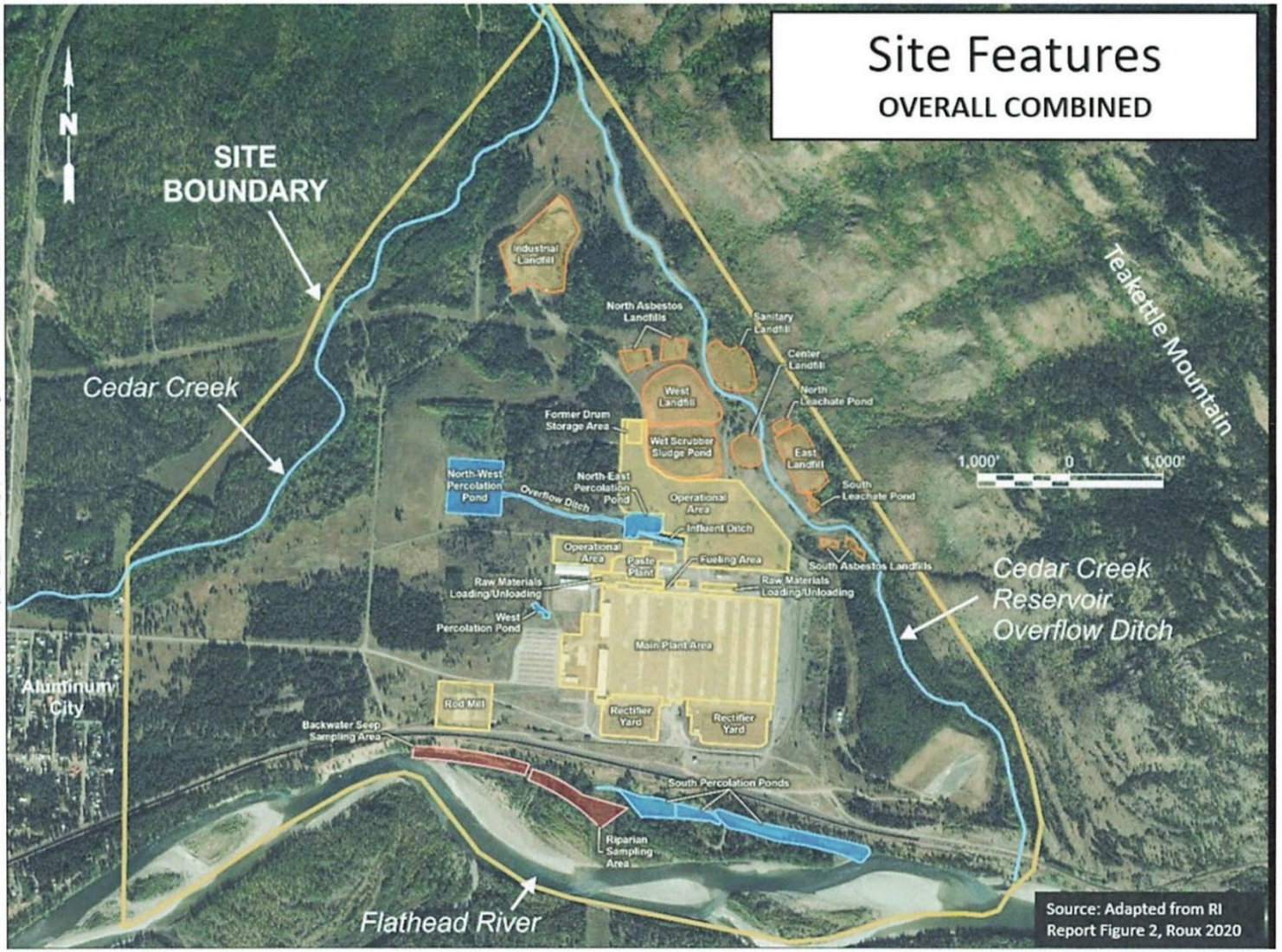
The Site is located at 2000 Aluminum Drive near Columbia Falls, Flathead County, Montana. The Site is approximately two miles north-east from the center of Columbia Falls and is accessed by Aluminum Drive via North Fork Road (County Road 486; Roux 2020). The boundaries of the Site were defined in the RI/FS Work Plan (Roux, 2015), but under CECRA and CERCLA, the Site includes anywhere the hazardous substances have come to be located (43 C.F.R. § 11.14(oo)). The Site consists of approximately 960 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 to 2009. Building and industrial facilities associated with former operations remaining at the Site at the start of the RI/FS in 2016 included offices, warehouses, laboratories, mechanical shops, a paste plant, coal tar pitch tanks, pump houses, a casting garage, and the potline facility. Decommissioning of the industrial facilities was completed in the third quarter of 2019. The Site also includes seven closed landfills, one open landfill that was last used in 2009, material loading and unloading areas, two closed leachate ponds, and several percolation ponds. **Figure 1** shows the boundary of the former aluminum plant and Site features. The south end of the Site includes the switch yard (Rectifier Yard) jointly owned by CFAC and Bonneville Power Administration and the mainline of the Burlington Northern Santa Fe (BNSF) Railway Company. Note that the boundary shown on Figure 1 may not include all areas that contamination has come to be located.

There are no on-going manufacturing or commercial activities at the Site.

Figure 1. Site Boundary and Features

(Agreed ¶ 4; Ex. 848 at 2; *see also* Ex. 134 at 304.)



Source: Court Case

2.1.1 Surface Water

The Site is located in the Flathead River-Columbia Falls watershed (Roux, 2020). The Site is bordered by surface water features on each side, including the Flathead River to the south, Cedar Creek to the west, Cedar Creek Reservoir to the north, and Cedar Creek Reservoir Overflow Ditch to the east.

The Flathead River is a tributary to the Columbia River. The confluence of the North Fork and Middle Fork of the Flathead River is approximately 10 miles upstream of the Site, north of Coram, Montana. The South Fork joins the main stem of the Flathead River at the entrance of Badrock Canyon, approximately 2 miles upstream of the Site. The Flathead River flows west through the canyon towards the City of Columbia Falls, then south toward Flathead Lake. From 2008 to 2018, the average maximum yearly discharge at the Columbia Falls United States Geological Survey (USGS) station was approximately 44,509 cubic feet per second (cfs). Minor flood stage at this gauge is defined as 13 feet by the National Weather Service, and this gauge registered minor flooding or above minor flooding eight times since 2011. Surface water discharge data for the Flathead River from the nearest USGS station (Station No. 12363000, approximately 3 miles downstream of the Site) indicate that maximum discharge generally occurs within May and June while dates for the minimum discharge range between October and March. Hydrogeologic studies indicate that groundwater discharges into the Flathead River (Roux, 2020).

Cedar Creek originates north of the Site in the area contributing to the Cedar Creek Reservoir. From the reservoir outlet, Cedar Creek flows approximately 3 miles southwest towards the City of Columbia Falls. An intermittent tributary to Cedar Creek bisects the northern area of the Site. This feature is shown to be situated along the eastern side of the Industrial Landfill and joins Cedar Creek approximately 0.5 miles to the southwest of the Industrial Landfill. This feature was not observed during Site RI activities; however, surface water ponding and wetland vegetation were observed in the area south and southeast of the Industrial Landfill. Based on field observations by Roux (2020), the source of the ponding was attributed to seeps in the nearby cliff. This is shown as the Northern Surface Water Feature on **Figure 1**. At the western Site boundary, Cedar Creek drains an additional 1.5 square mile (mi^2) area, predominately from the western two-thirds of the Site.

The Cedar Creek Reservoir Overflow Ditch flows intermittently in the spring and regulates flow for Cedar Creek and the Cedar Creek Reservoir. Based on proximity and land surface topography, some surface water runoff from the eastern side of the Site, originating from the East Landfill and the Sanitary Landfill, as well as runoff from the western flank of Teakettle Mountain, flows to the ditch. Excluding potential upgradient contributions from the Cedar Creek Reservoir, the ditch has a catchment area of approximately 2.0 mi^2. About 20% of this catchment originates on-Site and the remaining catchment extends to the peak of Teakettle Mountain to the east.

2.1.2 Groundwater

At least two hydrogeologic units underly the Site: the upper unit and the below upper unit. The upper unit consists of coarse-grained glacial outwash and alluvium deposits. The upper unit appears to be horizontally continuous across the Site, though perched zones have been documented in the area. The below upper unit is characterized by higher percentage fines, denser, and drier than the

overlying outwash and alluvium deposits. The below upper unit likely has lower hydraulic conductivity than the upper unit.

Groundwater in the region is typically recharged from the surface water sources within the watershed, including numerous reservoirs, ponds, streams, and lakes, as well as through infiltration of precipitation (Roux, 2020). Groundwater in the region may also discharge to surface water bodies seasonally. During typical spring runoff and increased precipitation events such as rain or snow, the Flathead River recharges groundwater and acts as a losing stream. However, during dry weather conditions the Flathead River becomes a gaining stream, receiving groundwater discharge, which is the case for much of the year.

2.1.3 Aquatic, Terrestrial, and Transitional Habitat

The Site is within the Stillwater Swan Wooded Valley ecoregion and contains aquatic, terrestrial, and transitional habitat (Roux, 2020). Two lotic aquatic habitats exist within and around the Site, including the Flathead River and Cedar Creek. Lotic aquatic habitats (flowing streams and rivers) are suitable for the establishment of fish and invertebrate communities, as well as semi-aquatic birds or mammals that rely on aquatic flora or fauna as a food resource. The Flathead River is considered a large river by DEQ. Key physical habitats include cobble or gravel substrate; deep, fast-flowing water; and, depending on valley dimensions, multi-thread channels. In the river reach adjacent to the Site, the Flathead River provides fish habitat for common species. Given the absence of extensive agriculture or other non-anthropogenic nutrient sources upgradient, the Flathead River is considered oligotrophic, meaning it lacks macronutrients such as phosphorus.

Cedar Creek is a small headwater stream that discharges to the Flathead River. Small headwater stream habitats in the region can be distinguished primarily by their hydrologic regime. Montane headwater streams that originate in the high-elevation peaks have characteristically high spring and early summer flows, with the spring freshet due to snow melt. Small headwater systems are often oligotrophic.

Terrestrial habitats are dry, upland areas that may support above ground and/or below ground terrestrial flora and fauna. Terrestrial exposure areas at the Site include the following as identified in the Baseline Ecological Risk Assessment (BERA; Appendix E to the RI [Roux, 2020]):

- Main Plant Area,
- Central Landfills Area,
- Industrial Landfill Area,
- Eastern Undeveloped Area,
- North-Central Undeveloped Area,
- Western Undeveloped Area, and
- Flathead River Riparian Area.

Though not identified in the BERA, terrestrial resources may also have been impacted on Teakettle

Mountain.

There are four primary terrestrial habitats on the Site, which are characterized by the type of vegetation present. These habitats include mixed conifer forest, riparian forest, deciduous shrubland, and open grassland. Conifer forests are predominantly found to the north and west of the Main Plant Area and are mostly bordered by riparian woodlands. Several areas of deciduous shrubland are located northeast and east of the Main Plant Area. Open grasslands are located immediately north and west of the Main Plant Area, between the Main Plant Area and the mixed conifer and riparian forests.

Transitional habitats are characterized by intermittent or seasonal surface water inundation. Transitional habitats can potentially support aquatic receptor species during certain life stages (e.g., benthic invertebrates, juvenile herpetofauna), as well as terrestrial species during dry periods (e.g., soil invertebrates, terrestrial plants). Transitional exposure areas at the Site consist of:

- North Percolation Pond Area,
- South Percolation Pond Area,
- Cedar Creek Reservoir Overflow Ditch, and
- Northern Surface Water Feature.

2.2 Site History

2.2.1 Operational History

The Site was operated as a primary aluminum reduction facility (commonly referred to as an aluminum smelter) from 1955 until 2009 (Roux 2020). The smelter 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 a fourth and fifth potline were added in 1968, increasing total aluminum production capacity at the Site to 180,000 tons per year. The plant expanded to 10 potlines in the late 1960s. 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 smelter in March 2015.

During aluminum production, the Hall-Héroult process and the Vertical Stud Soderburg technology were used to reduce alumina into aluminum. In the Hall-Héroult process, aluminum oxide was dissolved into a sodium fluoride (cryolite) bath in a carbon-lined pot heated to 960 degrees Celsius. Electric current ran through a carbon anode made of petroleum coke and pitch, to a carbon cathode (a steel pot, firebrick liner, and a layer of carbon paste), reducing the aluminum ion into aluminum metal. The anode was consumed during the reaction and molten aluminum formed at the bottom of the pot. The molten aluminum was tapped from the pot and transported to the Case House where it was cast into ingots for off-Site shipment. Over the years, as part of the casting process, various alloys and ingots have been produced at the smelter.

2.2.2 Waste Disposal

The aluminum production process generated several waste products, most notably spent potliner

(SPL). During the process, the sodium in the cryolite bath gradually penetrated the carbon paste lining of the pot, causing the carbon to swell and eventually fail. The typical lifespan of the carbon cathode was 5 to 7 years. To re-use the pot, the carbon lining of the pot (i.e., potliner) was removed and replaced with a new carbon lining. The SPL consisted of a thick layer of carbon bonded to an insulating brick layer containing fluoride, sodium, aluminum, and small amounts of cyanide. The fluoride and sodium in the SPL were from the sodium fluoride (cryolite) bath and the cyanide formed in the cathode as a side chemical reaction during aluminum production.

The aluminum production process generated air emissions, including particulate fluoride, hydrogen fluoride, and PAHs. The main sources of air emissions were typically the Paste Plant and the aluminum reduction facility (i.e., potline buildings; EPA, 1998). Air pollution from the smelting process was controlled by wet scrubber until 1976, and air pollution from the Paste Plant also used a wet scrubber from 1955 to 1999. Wastewater from the Paste Plant wet scrubber was discharged to the North Percolation Ponds (CFAC, 2003). The aluminum reduction facility wet scrubbers were replaced with dry scrubbers in 1976, and an analysis of the sludge by Columbia Falls Reduction Plant laboratory staff indicated that the sludge was approximately 80% calcium fluoride on a dry weight basis, and also contained calcium oxide, magnesium oxide, sodium oxide, and iron oxide (Hydrometrics, 1993). The sludge generated from the aluminum reduction facility wet scrubbers was landfilled on Site at the Wet Scrubber Sludge Pond.

Raw materials were delivered to the Site predominantly by rail and included aluminum oxide (i.e., alumina), petroleum cake, coal tar pitch, and fluoride/cryolite. Alumina was delivered to the off-loading buildings where the alumina was transferred to the silos between the potlines. Petroleum coke and coal tar pitch were delivered to the northwest side of the plant and mixed in the Paste Plant to form briquettes to be used as anodes.

Solid waste generated by the aluminum production process was primarily disposed of in on-Site landfills until 1990, after which SPL was shipped off-Site for disposal as hazardous waste. In addition to SPL and wet scrubber sludge, the on-Site landfills were reportedly used to dispose of other wastes such as: dross, solvents, potliner refractory wastes (non-hazardous; likely the scrap calcined petroleum coke, ore, cryolite, aluminum fluoride, bath, brick, concrete), scrap metal, wood, used oil, and municipal solid waste.

Liquid waste generated as a result of the aluminum reduction process and stormwater was discharged to several percolation ponds.

2.2.3 Remedial Activities

Under the 2020 AOC entered into by CFAC and EPA, CFAC completed early remedial actions, consisting of removal of sediments from the South Percolation Ponds and returning flow of the Flathead River to its northern channel. Because the area had been fully characterized and the natural movement of the Flathead River threatened flooding of the area, CFAC conducted a removal action. Work began in October 2020 and was completed in March 2021 (CFAC, 2021).

2.3 Hazardous Substances Released

As described in the Court Case, approximately 40 chemicals were identified as contaminants of

potential concern at the Site. Cyanide, fluoride, arsenic, and PAHs (including benzo(a)pyrene) are each hazardous substances pursuant to 42 U.S.C. § 9601(14). Concentrations of chemicals that exceeded screening levels, including EPA Regional Screening Levels, EPA water quality standards (EPA, 2018), DEQ water quality standards (DEQ-7; Montana DEQ, 2019), and ecological screening values, are summarized in Table 1. In addition, aluminum, barium, cadmium, copper, iron, manganese, nickel, selenium, thallium, vanadium, and zinc were found to pose risk to ecological receptors, along with Aroclor 1254 and bis(2-ethylhexyl)phthalate (BEHP) (Roux, 2020).

Table 1. Concentrations of Analytes that Exceed Screening/Cleanup Levels in Site Media

Contaminant	Soil (mg/kg)			Groundwater (ug/L)			Surface Water (ug/L)			Sediment (mg/kg)			Sediment Pore water (ug/L)		
	Min SL		Site Max	Min SL		Site Max	Min SL		Site Max	Min SL		Site Max	Min SL		Site Max
Cyanide, Total	0.002	A	137	0.15	C	11500	5	B	630	0.0001	B	8.5	5	B	491
Cyanide, Free	0.002	A	<0.56[a]	0.15	C	306	5	B	140	0.0001	B	0.89[b]	5	B	62.4
Fluoride	6.5	B	810	80	C	55300	120	B	22400	12	A	219	120	B	3140
Benzo(a)pyrene	0.029	A	2000	0.025	C	<0.17[a]	0.014	B	3.9	0.029	A	100	0.014	B	0.1
Aroclor 1254	0.002	A	1.2												
Aluminum							87	B	32000						
Antimony				0.78	C	8.3									
Arsenic	0.002	A	34.2	0.052	C	92.6	3.1	B	18.5	0.0015	A	26.4	3.1	B	3.9
Barium	1.04	B	1560				4	B	2710	16	A	969	4	B	421
Cadmium							0.25	D	3	0.069	A	8			
Copper	2.8	A	7260				0.23	B	183	2.8	A	143	0.23	B	2.9
Iron							158	B	52100						
Lead										35.8	B	109			
Manganese	2.8	A	3950												
Nickel	2.6	A	1250							2.6	A	771			
Selenium	0.028	B	3.3							0.052	A	4.4			
Thallium	0.001	A	4.6												
Vanadium	0.714	B	348							8.6	A	233			
Zinc	6.62	B	694				30	B	537	37	A	871			

Notes: Min SL – minimum screening level (Roux, 2020): A – EPA Protection of Groundwater Risk-Based Soil Regional Screening Level, B – Ecological Screening Val
ue, C – EPA Risk-Based Screening Level Tapwater Regional Screening Level, D – DEQ-7 Chronic Aquatic Life Standard based on hardness of 25 mg/L; mg/kg – milligrams per kilogram, ug/L – micrograms per liter; blank cell – data not presented in the RI; [a] – non-detect results but reporting limit exceeds screening level; [b] – only 2 samples collected.
Source: Tables 11-17 in the RI (Roux, 2020)

2.4 Sources of Hazardous Substances

As described in the Court Case, several waste streams were created during the course of aluminum production at the Site and approximately 40 chemicals were identified as contaminants of potential concern. Cyanide and fluoride in groundwater are of primary concern, as well as PAHs and polychlorinated biphenyls (PCBs) in soils. Historic EPA data indicate that fluoride may also have caused injury to terrestrial resources at the aluminum plant and Teakettle Mountain (EPA, 1973).

Section IV of the Court Case describes sources of hazardous substances and their release to the environment. Briefly:

- **SPL**: Periodically, SPLs were removed from their steel shells and replaced with new carbon lining. SPLs were contaminated with cyanide, fluoride, sodium, and aluminum by the time of their removal. When exposed to rainwater, cyanide and fluoride can leach into groundwater.
- **Wet Scrubber Sludge**: Operation of the aluminum reduction pots generated air emissions containing fluoride, PAHs, and other contaminants. Contaminants associated with plant emissions dispersed in the atmosphere and deposited in Site soils. Atlantic Richfield Co. controlled emissions from potlines using wet scrubbers until the late 1970s, when it replaced them with dry scrubbers. Sludge from the wet scrubbers was landfilled in the Wet Scrubber Sludge Pond (WSSP). Analysis of wet scrubber sludge indicated it contained approximately 80% calcium fluoride on a dry weight basis. Atlantic Richfield Co. disposed of sludge from approximately 1955 to 1977 when the wet scrubbers were decommissioned.
- **Soaking Pits**: Atlantic Richfield Co. constructed pits at the northern end of the Main Plant Area in which it placed spent pots and filled them with water to help loosen and release the SPL. The water used to soak the pots became contaminated with cyanide, fluoride, and PAHs, and was drained to the Northeast and Northwest Percolation Ponds.
- **North Percolation Ponds**: In addition to water from the soaking pits, liquid waste generated as a result of the aluminum reduction process and stormwater were discharged to the North Percolation Ponds.
- **Former Drum Storage Area**: Drummed liquid wastes were stored in this area prior to off-Site shipment and disposal.
- **Landfills**: Landfills were used to dispose of wastes from the aluminum plant, including aluminum dross, solvents, asbestos, potliner refractory wastes (non-hazardous)-likely the scrap calcined petroleum coke, ore, cryolite (including aluminum fluoride), brick, concrete, scrap metal, wood, used oil, and plant trash and other municipal solid waste.
- **Transportation**: Spills sometimes occurred during transportation and transfer of waste products and industrial material for use at the Site.

2.5 Time, Quantity, Duration, and Frequency of Releases

The aluminum plant operated between 1955 and 2009, and some discharges from the Site still

continue. The following sections contain a summary of known times, quantities, durations, and frequencies of releases. More detail is presented in Section IV.A and IV.B of the Court Case.

2.5.1 SPL

Between approximately 1960 through 1980, 129,000 to 135,000 tons of SPL were disposed of in two unlined landfills: the West and Center Landfills. SPL was also disposed of in the East Landfill from 1980 to 1990, which was lined. Samples taken in 1980 showed 36 milligrams per liter (mg/L) of cyanide in pot bottoms from a landfill, 16 mg/L of cyanide in SPL from a carbon pile face, and 0.42 mg/L of cyanide in crushed pot bottom extract. Samples of SPL taken in January 1988 and March 1992 were found to contain 0.1% cyanide and 16% fluoride.

2.5.2 Soaking Pits

Spent pots were held in the soaking pits for about eight hours to cool them. Approximately 1,800 pots were processed through the soaking pits, resulting in an estimated 180 million gallons of water passing through the soaking pits to the North Percolation Ponds during their roughly 14 years of operation. Spent water contained hazardous substances including cyanide, fluoride, and PAHs.

2.5.3 WSSP

The WSSP was an unlined pond used from 1955 to 1973 by Atlantic Richfield with discrete disposal events between 1983 and 1984. CFAC also used the WSSP for discrete disposal events between 1987 and 1994. The WSSP was used for disposal of calcium fluoride wet scrubber sludge (approximately 1955-1979), leachate (1983, 1984, 1987, 1989, 1994), and pot diggings (1993-1994, partially excavated in 1998).

An earthen cap was put on the WSSP in 1981 and replaced with a clay cap in 1992, and then a synthetic cap in 1994. The RI notes that the highest concentrations of cyanide and fluoride in groundwater were observed adjacent to and/or downgradient of the West Landfills and the WSSP (Roux, 2020), indicating that these are the primary sources of cyanide and fluoride to groundwater.

2.5.4 North Percolation Ponds

The North Percolation Ponds received discharges from various operations within the Main Plant Area. The Northeast Percolation Pond was constructed in 1955 and used until manufacturing ceased in 2009. It is currently used as a discharge point for the Site's stormwater drainage. The Northeast Percolation Pond is connected to the Northwest Percolation Pond by an unlined drainage ditch. The Northwest Percolation Pond was constructed in 1972 to receive overflow from the Northeast Pond. The Northeast Pond is unlined and the Northwest Pond is assumed to be unlined.

The North Percolation Ponds and connecting ditch show high concentrations of PAHs and cyanide in sediments. Though they were not identified as a continuing source of groundwater cyanide and fluoride contamination, the unlined nature and use of these ponds and conveyance systems are an obvious potential source of Site groundwater contamination.

2.5.5 Former Drum Storage Area

Atlantic Richfield Co. began using the Former Drum Storage Area in approximately 1980. CFAC

continued to use the Storage Area and the year it was closed is unknown but apparently it was before 1996. The pad was earthen and unlined and was used for storage of drums containing RCRA-listed wastes for shipment off-Site. Surface soil in the Former Drum Storage Area was contaminated with PAHs, metals, cyanide, and fluoride. It was not suspected to be a primary contributor to groundwater contamination during the Court Case, but more investigation may be necessary.

2.5.6 Landfills

Several landfills were used at the Site for various purposes. Table 2 summarizes these landfills, the periods that they operated, their construction, and the types of waste they were used for.

Table 2. Summary of Site Landfills

Site Area	Years of Operation	Construction	Type of Waste
West Landfill	1960-1980 (approx.)	Unlined bottom Earthen cap 1981 Clay cap 1982 Synthetic cap 1994	SPL (1960-1970), sanitary, municipal solid waste, scrap (steel, wood, strapping, scrap from shops)
Center Landfill	1970-1980 (approx.)	Unlined bottom Clay cap 1980	SPL, sanitary, scrap from shops
East Landfill	1980-1990	Clay liner bottom Clay cap and synthetic cap 1990	SPL (1980-1990)
Industrial Landfill	1980-2009	Assumed unlined bottom Closed 2009	Scrap metal, wood, municipal solid waste
Asbestos Landfills	Late 1970s-2009	Assumed unlined bottom Closed 2009 (earthen cap)	Asbestos

Notes: approx. – approximately; SPL – spent potliner; source: Court Case.

Further detail on the contents and use of these landfills can be found in Section IV.B of the Court Case. The RI notes that the highest concentrations of cyanide and fluoride in groundwater were observed adjacent to and/or downgradient of the West Landfill and the WSSP (Roux, 2020), indicating that these are the primary sources of cyanide and fluoride. The Center Landfill was also identified as a likely secondary source of cyanide and fluoride in groundwater. The East Landfill was not identified as a significant source of cyanide and fluoride, likely because it was lined.

PAHs have been detected in surface soil, shallow soil, and groundwater from the Industrial Landfill (Roux, 2020). The Asbestos Landfills were capped and asbestos was not detected in surface soils from the landfills during the RI, though asbestos-containing building materials may have a tendency to rise in the soil column due to uplift of soil and materials in the soil, so receptors may be exposed to these substances in the future (Roux, 2020).

2.5.7 Transportation

Though spills sometimes occurred during transportation of waste products and industrial materials, details of these spills are unknown.

2.5.8 Permitted Discharges

Discharges under the Groundwater Pollution Control System Permit

As described in the Court Case, Atlantic Richfield Co. applied for a groundwater discharge permit in 1983, and test wells at the time exhibited elevated levels of cyanide and fluoride. In 1984, MDHES issued a permit to allow certain discharges to the surface impoundments and indirectly to groundwater, prohibiting degradation of groundwater beyond the property boundary and requiring, among other things, monitoring and management of Site groundwater. Under this permit, leachate was discharged onto the Wet Scrubber Sludge Pond five times during plant operation.

Discharges under the MPDES Permit

In 1994, MDHES issued a Montana Pollutant Discharge Elimination System (MPDES) permit to CFAC for the groundwater contaminated by historical SPL disposal practices, released via a seep to the Flathead River. This permit authorized processed wastewater discharges to specified receiving ponds and to groundwater, with specific conditions including to track the cyanide concentrations from the landfill to the Flathead River. This permit was reissued in 1999 and terminated in 2019.

Related to the 1999 permit, DEQ performed a groundwater inspection at the Site and concluded that groundwater was contaminated and elevated levels of cyanide were present in the seeps that were discharging from the Site to the Flathead River, which DEQ determined was an unauthorized discharge of pollutants. Those seeps remained active and in 1996, EPA issued a Notice of Violation of the Clean Water Act for cyanide discharge to the Flathead River. In 1997, DEQ issued a Notice of Violation of the Montana Water Quality Act for discharge of industrial waste to the Flathead River.

Instead of addressing the cyanide-contaminated seeps, CFAC obtained permission from DEQ to modify its MPDES permit to allow for a “mixing zone” in the Flathead River, wherein DEQ would allow cyanide concentrations in the Flathead River to exceed State water quality standards. This mixing zone was effectively eliminated in 2014 when DEQ issued a revised MPDES permit to CFAC. CFAC appealed but the permit was terminated in 2019 because of the closure of the smelter. However, the discharge of cyanide-contaminated seepage from the Site into the Flathead River continues today.

2.6 Damages Excluded from Liability

The Trustees evaluated whether the damages being considered are barred by specific defenses or exclusions from liability under CERCLA or the CWA [43 C.F.R. §§ 11.24(b) and (c)]. The possible exclusions of liability include whether damages:

- Resulting from the releases were specifically identified as an irreversible and irretrievable commitment of natural resources in an environmental impact statement or other comparable environmental analysis, that the decision to grant the permit or license authorizes such commitment of natural resources, and that the facility or project was otherwise operating within the terms of its permit or license, so long as, in the case of damages to an Indian tribe occurring pursuant to a Federal permit or license, the issuance of the permit or license was not inconsistent with the fiduciary duty of the United States with respect to such Indian Tribe; or
- Resulted from releases of a hazardous substance from which such damages haveoccurred

wholly before the enactment of CERCLA; or

- Resulted from the application of a pesticide product registered under the Federal Insecticide, Fungicide, and Rodenticide Act, 7 U.S.C. §§ 135–135k; or
- Resulted from any other Federally permitted release, as defined in Section 101 (10) of CERCLA; or
- Resulted from the release or threatened release of recycled oil from a service station dealer described in Section 107 (a)(3) or (4) of CERCLA if such recycled oil is not mixed with any other hazardous substance and is stored, treated, transported or otherwise managed in compliance with regulations or standards promulgated pursuant to Section 3014 of the Solid Waste Disposal Act and other applicable authorities; or
- Resulted from a discharge that meets one or more of the exclusions provided in Section 311 (a)(2) or (b)(3) of the CWA.

The Trustees have determined that none of the potential injuries resulting from hazardous substance releases at the Site meet any of the above exclusion criteria, nor are they subject to any other exceptions to liability provided under Sections 107 (f), (i), and (j); and 114(c) of CERCLA. The Trustees recognize that some of the releases resulted from a permitted release; however, the Court Case did not distinguish these releases when determining how to apportion liability and these releases are not distinguishable from the other releases of hazardous substances.

3. Preliminary Identification of Potentially Injured Natural Resources

This section presents a preliminary identification of natural resources potentially at risk from hazardous substances released from the Site pursuant to the CERCLA NRDAR Regulations. Section 3.1 describes pathways of exposure [43 C.F.R. § 11.25(a)]. Section 3.2 summarizes the areas and resources that have been exposed to hazardous substances [43 C.F.R. § 11.25(b)] and presents estimates of concentrations of hazardous substances in these areas [43 C.F.R. § 11.25(d)], including in exposed water [43 C.F.R. § 11.25(c)]. Section 3.3 describes natural resources and services that are potentially affected because of exposure to hazardous substances [43 C.F.R. § 11.25(e)].

Operations at the Site either used or produced hazardous chemicals on site. These included cyanide, fluoride, PAHs, and arsenic. Releases of these chemicals at the Site have contaminated soils, sediments, and groundwater. Surface water, fish, and migratory birds may have been contaminated due to contaminated groundwater discharging to local ditches and the Flathead River.

3.1 Preliminary Identification of Pathways

Primary sources of contamination are summarized in Sections 2.4 and 2.5. Groundwater was contaminated by infiltration from unlined landfills, storage areas, and ponds. In addition, atmospheric deposition from Site emissions contaminated Site soils (Roux, 2020), although the extent of this is unknown, because air pollution from the smelting process was controlled by wet scrubber until 1976, and air pollution from the Paste Plant also used a wet scrubber from 1955 to 1999.

Aquatic habitat was exposed to contamination by direct discharge of contaminated groundwater to surface water and overland stormwater runoff associated with precipitation or snowmelt (Roux, 2020). Runoff also affected terrestrial and transition habitat, in addition to direct discharges of stormwater and wastewater.

3.1.1 Direct Contact of Biota with Hazardous Substances

Terrestrial and aquatic biota may come in direct contact with hazardous substances (e.g., PAHs, Aroclor 1254, cyanide, fluoride, and metals) through dermal and ingestion exposure of contaminated surface water, soil, and sediment at the Site.

For terrestrial wildlife, incidental ingestion of contaminated soil is a plausible exposure pathway for small home range terrestrial receptors such as small mammals (e.g., mice and shrews). Ingestion of contaminated sediments is also a significant exposure pathway to semi-aquatic receptors such as American Dippers (*Cinclus mexicanus*) and Mallards (*Anas platyrhynchos*), as well as plants and soil-dwelling organisms that are in direct contact with hazardous waste present in the soil profile. Additionally, amphibians and reptiles can be exposed to contaminants through the ingestion of contaminated surface water.

For aquatic organisms, ingestion of and dermal contact with contaminated surface water and sediments are important exposure pathways. Direct exposure to surface water can be toxic to fish and other aquatic organisms due to high levels of contaminants. Elevated concentrations of hazardous substances in streambed sediments can expose some benthic organisms directly and cause

toxicity.

3.1.2 Surface Water/Sediment Pathway

Surface water and associated sediments are exposed to hazardous substances released from a variety of hazardous waste sources present throughout the Site. There are exceedances of the DEQ-7 standards for contaminants in surface water from cyanide, fluoride, benzo(a)pyrene, and arsenic.

3.1.3 Groundwater Pathway

Groundwater was contaminated by infiltration from unlined landfills, storage areas, and ponds. There are exceedances of the DEQ-7 standards for contaminants in groundwater from cyanide, fluoride, and arsenic.

3.1.4 Aerial Transport Pathway

The extent of air transport at the Site is currently unclear with air pollution from the smelting process being controlled by wet scrubber until 1976. Air pollution from the Paste Plant was also controlled using a wet scrubber from 1955 to 1999.

3.1.5 Soil Pathway

Soil has been exposed to hazardous substances released from a variety of hazardous waste sources present throughout the Site. Concentrations of cyanide, fluoride, benzo(a)pyrene, and arsenic exceed screening levels for contaminants in soil.

3.1.6 Aquatic-terrestrial Food Web Pathway

Aquatic-terrestrial food web exposures occur when prey organisms accumulate contaminants within their tissues and are subsequently consumed by a predator. Elevated levels of contaminants measured at the Site in the surface water, groundwater, and sediment suggest the potential to cause adverse effects in aquatic-terrestrial linked organisms. For instance, semi-aquatic receptors such as ospreys (*Pandion haliaetus*), belted kingfishers (*Megaceryle alcyon*) and tree swallows (*Tachycineta bicolor*) are potentially exposed to elevated levels of metals, PAHs, and Aroclor 1254 that may be specific to the Site.

3.2 Areas and Resources Exposed to Hazardous Substances

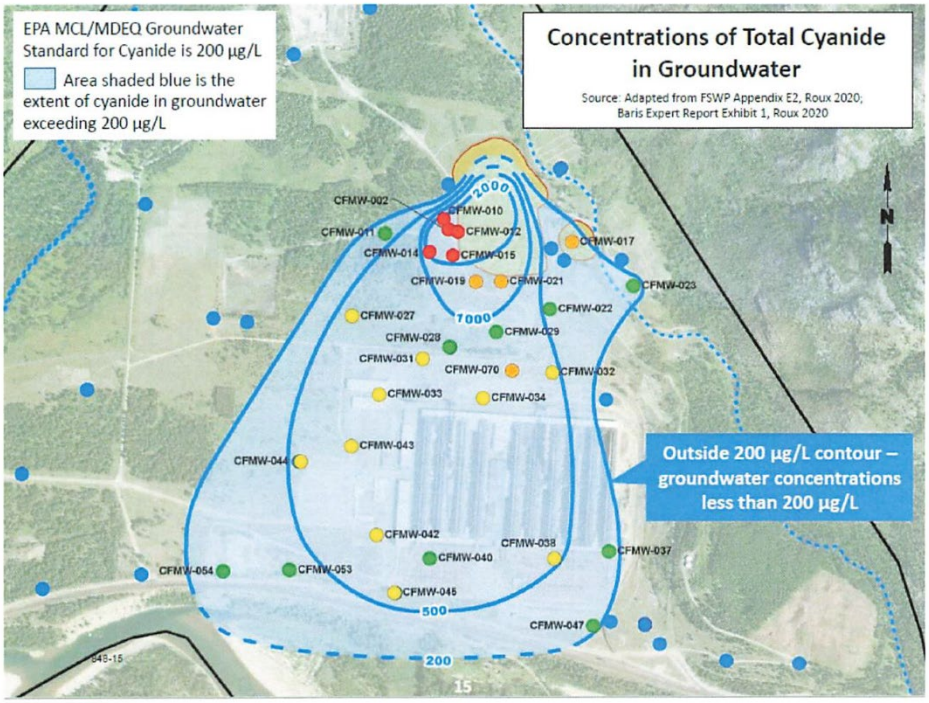
Approximately 40 chemicals were identified as contaminants of potential concern in the risk assessments and RI. Contamination has been found in Site groundwater, soil, sediments, and surface water. Table 1 summarizes Site exceedances of minimum screening levels. Table 3 shows maximum concentrations of cyanide, fluoride, benzo(a)pyrene (a PAH), and arsenic measured in Site media compared to DEQ's Circular DEQ-7 Montana Numeric Water Quality Standards (DEQ-7; Montana DEQ, 2019) or ecological screening values (ESVs) presented in the BERA (Roux, 2020). With the exception of benzo(a)pyrene in groundwater, all analytes exceed the associated DEQ-7 standard or ESV. Cyanide and fluoride in groundwater are of particular concern. Figure 2 shows the concentrations of cyanide in Site groundwater and Figure 3 shows groundwater fluoride concentrations. There are exceedances of the DEQ-7 standards for contaminants, including cyanide, in Cedar Creek and the overflow ditch.

Table 3. Maximum Concentrations of Primary Contaminants of Concern in Site Media

	Soil		Groundwater		Surface Water		Sediment		Pore water	
	mg/kg		ug/L		ug/L		mg/kg		ug/L	
Analyte	ESV	Site	DEQ-7	Site	DEQ-7	Site	ESV	Site	ESV[1]	Site
Cyanide	0.098	137	200	10,800	4	630	0.0001	8.5	5.2	491
Fluoride	120	976	4,000	52,900	4,000	22,400	290.2	219	120	3,140
Benzo(a)pyrene	1.52	2,000	0.05	ND	0.0012	3.9	0.032	100	0.014	0.1
Arsenic	5.7	34.2	10	82.1	10	18.5	9.79	26.4	3.1	3.9

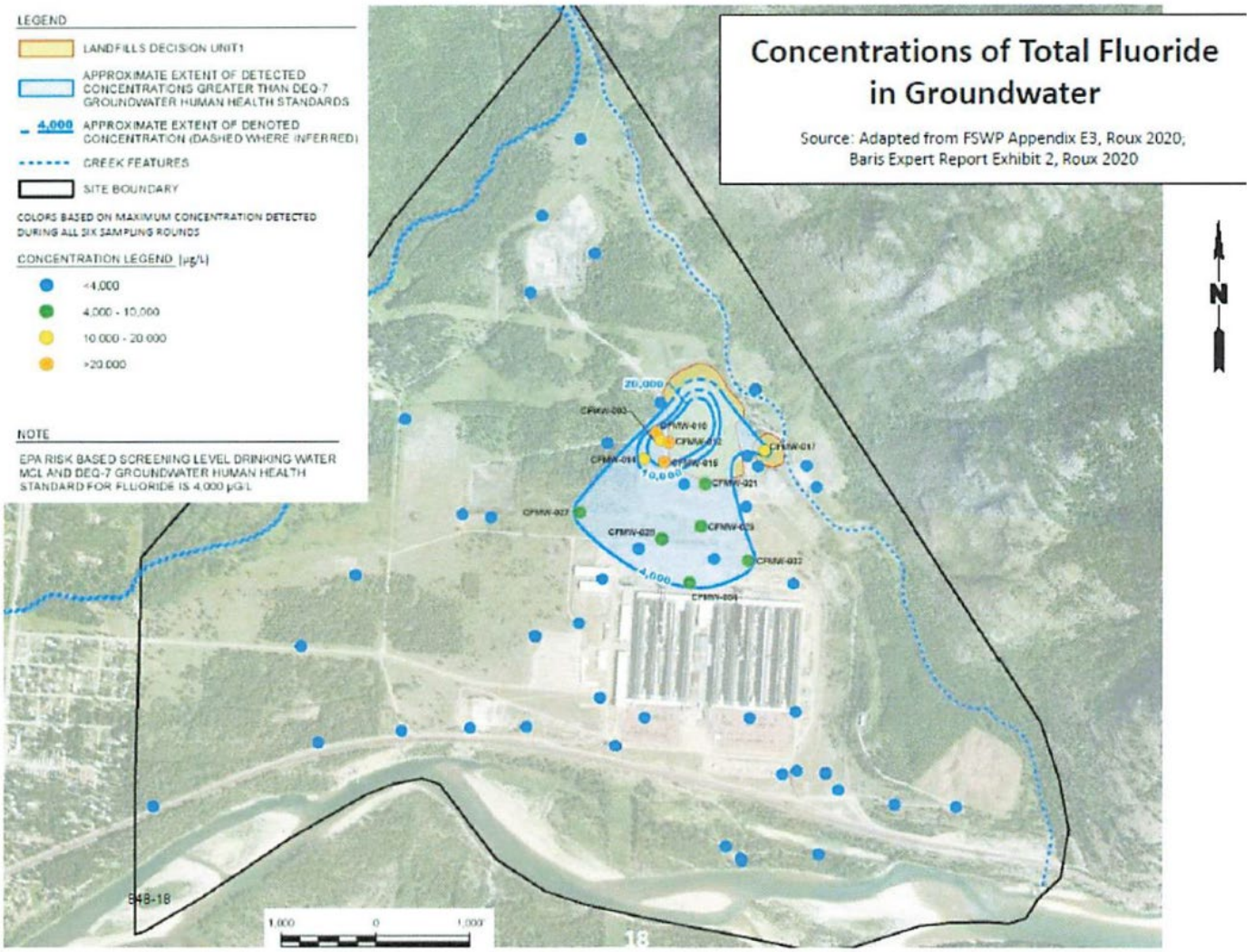
Notes: mg/kg – milligrams per kilogram; ug/L – micrograms per liter; ESV – ecological screening value, determined in the BERA (Roux, 2020); DEQ-7 – Circular DEQ-7 Montana Numeric Water Quality Standards; ND – not detected; 1 – ESV for surface water (Roux, 2020).

Figure 2. Concentrations of Total Cyanide in Groundwater



Source: Court Case.

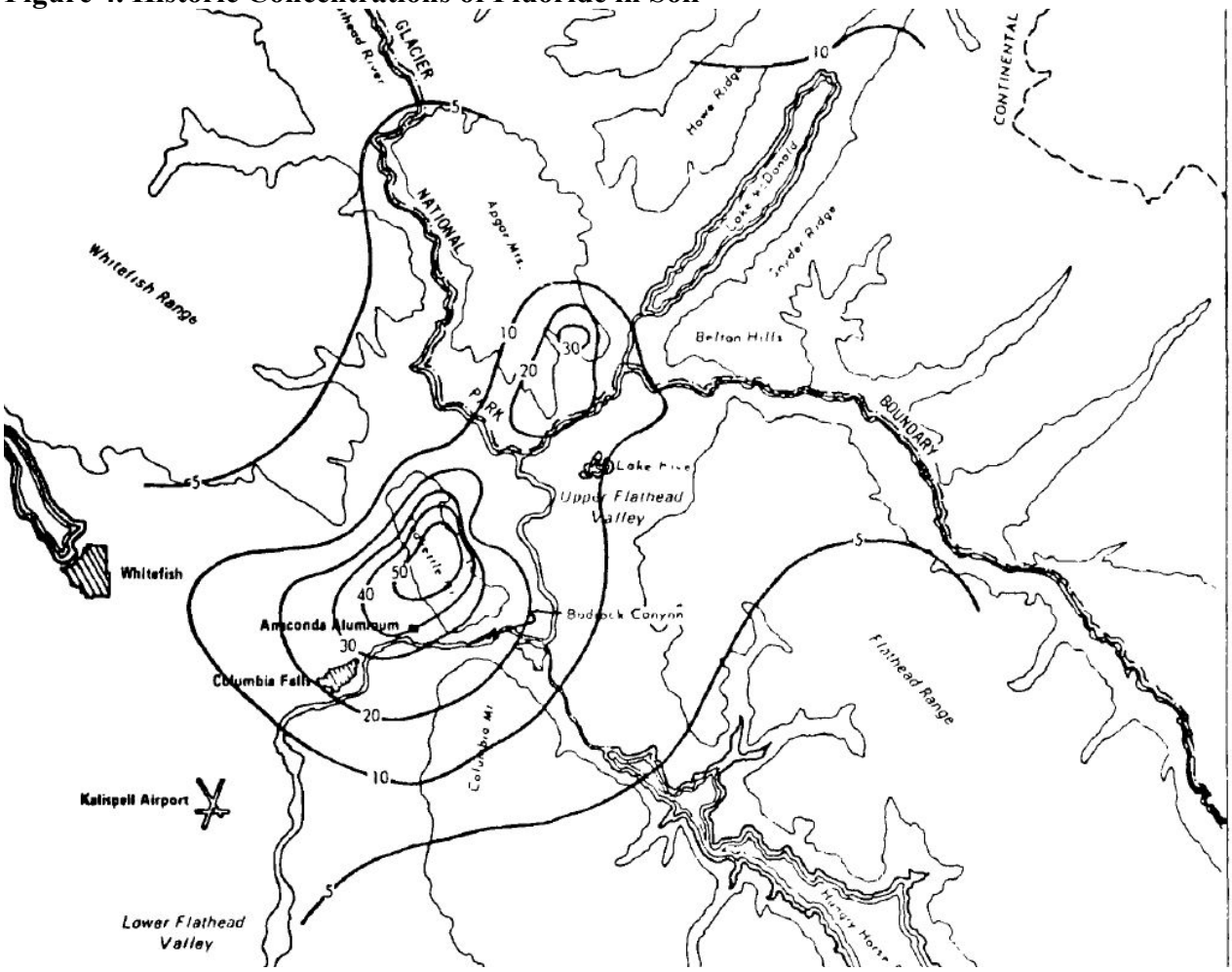
Figure 3. Concentrations of Total Fluoride in Groundwater



Source: Court Case.

Historic EPA data indicate that fluoride from the site contaminated Teakettle Mountain northeast of the aluminum plant (Figure 4; EPA 1973).

Figure 4. Historic Concentrations of Fluoride in Soil



Source: EPA, 1973.

3.3 Potentially Affected Natural Resources and Services

The data presented above confirm that soils in floodplain habitat, surface water resources (including sediment), groundwater, and soil have been exposed to and continue to be exposed to elevated concentrations of hazardous substances. Potentially affected natural resources include, but are not limited to, groundwater resources, surface water resources (including sediments), and biological resources (e.g., fish and migratory birds). Contaminants that were found to pose risk to biological receptors in the BERA are summarized in Table 4.

Table 4. Summary of Risk to Biological Receptors Posed by Contaminants of Concern

	Exposure Area		
Analyte	**Terrestrial**	**Transitional**	**Aquatic**
PAHs	Moderate	High	High
Aroclor 1254	Moderate	--	--

BEHP	Moderate	Minimal	--
Cyanide	--	High	Moderate
Fluoride	--	High	High
Metals[1]	Moderate	High	High

Notes: BEHP – bis(2-ethylhexyl)phthalate; PAHs – polycyclic aromatic hydrocarbons; 1 – Metals posing risk vary depending on receptors, media, and type of exposure. Varying levels of risk were found from aluminum, barium, cadmium, copper, iron, manganese, nickel, selenium, thallium, vanadium, and zinc. Source: BERA (Roux, 2020).

The natural resource services that have been potentially affected by the release of and exposure to hazardous substances from the Site include both ecological (e.g., habitat for biota) and human use services. Natural resource services are the physical and biological functions performed by the resource, which are the result of the physical, chemical, or biological quality of the resource [43 C.F.R. § 11.14(nn)].

Natural resource services also include human uses of natural resources [43 C.F.R. § 11.14(nn)]. Potentially affected human use of natural resources include water use and recreation.

4. Preliminary PAS Criteria Determinations

This section presents an evaluation of the preassessment determination criteria [43 C.F.R. § 11.23(e)]. The information presented and summarized in this section confirms:

- A release of hazardous substances has occurred
- Natural resources for which the Trustees may assert trusteeship have been or likely have been adversely affected by releases of hazardous substances
- The quantity and concentration of the released hazardous substances are sufficient to potentially cause injury
- Data sufficient to pursue an assessment are readily available or likely to be obtained at reasonable cost
- Response actions will not sufficiently remedy the injury to natural resources without further action.

The information supporting these conclusions is presented below.

4.1 Criterion 1 – A Discharge of Oil or a Release of a Hazardous Substance has Occurred

Preliminary site investigations show that releases of hazardous substances have occurred at theSite (see Section 2.3). Approximately 40 chemicals were identified as contaminants of potential concern, including, but not limited to:

- Cyanide,
- Fluoride,
- PAHs, and
- Arsenic.

There are documented elevated concentrations of hazardous substances in soil, groundwater, surface water, sediment, and sediment pore water at the Site. Based on the data in Section 2, the Trustees have confirmed that releases of hazardous substances have occurred at the Site.

4.2 Criterion 2 – Natural Resources for Which the Trustees May AssertTrusteeship under CERCLA Have Been or Are Likely to Have Been Adversely Affected by the Release

Although the full nature and extent of natural resource and resource service injuries at the Site is not yet fully characterized, existing data indicate that natural resources [as defined in 43 C.F.R. § 11.14(z)] for which the Trustees may assert trusteeship have been adversely affected by releases of hazardous substances. These natural resources include, but are not necessarily limited to, groundwater resources, surface water, aquatic habitat (including sediment), terrestrial habitat, and

transitional habitat. Elevated concentrations of hazardous substances have been found in groundwater, soil, surface water, sediments, and sediment pore water. Further, these hazardous substances are present at concentrations sufficient to potentially cause injury, as described in Section 3.3. Hazardous substances have potentially impacted a number of natural resource services, including ecological services (e.g., habitat for biota) and human use services such as water use and recreation.

4.3 Criterion 3 – The Quantity and Concentration of the Released Hazardous Substance is Sufficient to Potentially Cause Injury to Natural Resources

The quantity and concentration of the released hazardous substances is sufficient to potentially cause injury to natural resources and resource services including, but not limited to groundwater resources, surface water resources, and biological resources.

The definition of injury in the CERCLA NRDAR Regulations includes the following:

- Concentrations of substances in excess of drinking water standards, established by Sections 1411–1416 of the Safe Drinking Water Act (SDWA), or by other Federal or State laws or regulations that establish such standards for drinking water, in surface water that was potable before the discharge or release [43 C.F.R. § 11.62(b)(1)].
- Concentrations of substances in excess of drinking water standards, established by Sections 1411–1416 of the SDWA, or by other Federal or State laws or regulations that establish such standards for drinking water, in groundwater that was potable before the discharge or release [43 C.F.R. § 11.62(c)(1)].

Applicable drinking water standards include the National Primary Drinking Water Regulations under the SDWA (EPA, 2018) and the Circular DEQ-7 Montana Numeric Water Quality Standards (Montana DEQ, 2019). Based on results presented in the RI, hazardous substances released at the Site that exceed these criteria in surface water and groundwater include, but are not limited to, cyanide, fluoride, antimony, aluminum, arsenic, cadmium, copper, iron, and zinc (see Sections 2 and 3).

In addition, the BERA identified potential risk to biological receptors from exposure to PAHs, Aroclor 1254, BEHP, cyanide, fluoride, and metals, including aluminum, barium, cadmium, copper, iron, manganese, nickel, selenium, thallium, vanadium, and zinc. Risks were due to exposure of biological receptors in terrestrial, aquatic, and transitional habitats.

4.4 Criterion 4 – Data Sufficient to Pursue an Assessment Are Readily Available or Are Likely to Be Obtained at Reasonable Cost

Data relevant to assessing natural resource damages at the Site have been collected as part of remedial activities. Such data include information on hazardous substance sources, releases, pathways, and concentrations in the environment. Additional data collection efforts are ongoing.

In the CERCLA NRDAR Regulations, reasonable cost means that "the Injury Determination, Quantification, and Damage Determination phases have a well-defined relationship to one another and are coordinated and the anticipated cost of the assessment is expected to be less that the

anticipated damage amount" [43 C.F.R. § 11.14 (ee)]. Although the specific elements of injury determination, quantification, and damage determination have not yet been developed for this Site, the Trustees anticipate a well-defined and coordinated process. The Trustees expect that additional data collection to assess other trust resources and services can be conducted at reasonable cost, as defined in the regulations, and that these costs will be less than the anticipated damage amount.

4.5 Criterion 5 – Response Actions Carried out or Planned Do Not or Will Not Sufficiently Remedy the Injury to Natural Resources without Further Action

Response activities have not remedied natural resource and resource service injuries. Past natural resource and resource service injurieshave not been addressed, and the Trustees are unaware of any plan to address them. EPA has issued a proposed plan for a final cleanup in 2023; the preferred alternative, however, will not return the Site to baseline. Rehabilitation, restoration, or replacement of natural resources is required to reduce future injuries and compensate the public for interim losses of natural resources and the services they provide.

5. Determination

Following the review of the information as described in this PAS, the Trustees have made the determination that the criteria specified in the CERCLA NRDAR Regulations have been met. The Trustees have determined that there is a reasonable probability of making a successful claim for damages with respect to natural resources over which the Trustees have trusteeship. Therefore, the Trustees have determined that an assessment of natural resource damages is warranted.

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