2024 Annual Port BMP Plan Review

Please provide your signature below to certify that you have reviewed and approved the April, 2024 Port BMP Plan.

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APDES Permit AK0040649

RED DOG PORT SITE

Best Management Practices Plan

Best Management Practices
for
Water Pollution Prevention

Teck Alaska Incorporated
Red Dog Operations

2525 C St., Suite 310

Anchorage, AK 99517

May, 2024

Certification

I certify under penalty of law that this Red Dog Port Site Best Management Practices Plan and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gather and evaluate the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations.

Leslie Yesnik
General Manager, Red Dog Operations
Teck Alaska Incorporated

Date

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List of Acronyms and Abbreviations

ADEC	Alaska Department of Environmental Conservation
ADNR	Alaska Department of Natural Resources
AIDEA	Alaska Industrial Development and Export Authority
APDES	Alaska Pollutant Discharge Elimination System
ARD	acid rock drainage
BMP	best management practice
C-Plan	Oil Discharge Prevention and Contingency Plan
CFR	Code of Federal Regulations
CSB	concentrate storage building
CWA	Clean Water Act
Desal	desalinization
DMTS	DeLong Mountain Regional Transportation System
EMP	Environmental Management Program
EMS	Environmental Management System
EPA	U.S. Environmental Protection Agency
EPCRA	Emergency Planning and Community Right-to-Know Act
FRP	Facility Response Plan
gpm	gallons per minute
HDPE	high-density polyethylene
HE	heavy equipment
ISO	International Organization for Standardization
IX	Ion exchange
MS	material site
MWO	maintenance work order
NANA	NANA Regional Corporation
PAC	personnel accommodation complex
PM	preventive maintenance
PWP	potential water pollutant
RCRA	Resource Conservation and Recovery Act
RO	reverse osmosis
SAA	satellite accumulation area
SOP	standard operating procedure
STP	sewage treatment plant
TAK	Teck Alaska Incorporated
TUB	truck unloading building
TWUP	Temporary Water Use Permit
WIS	Waste Information System
ºF	degrees Fahrenheit

1 Introduction

The Red Dog Port Site Best Management Practices Plan describes the best management practices (BMPs) that Teck Alaska Incorporated (TAK) implements to prevent or minimize the potential for the release of pollutants from the DeLong Mountain Regional Transportation System (DMTS) Port Site, also known as the Red Dog Port Site (Port Site), to Waters of the United States (WOTUS) through normal operations and ancillary activities.

The Port Site is operated by TAK on behalf of the Alaska Industrial Development and Export Authority (AIDEA), to support the operations of the Red Dog Mine. Red Dog is a zinc-lead mine in the Northwest Arctic Borough of Alaska, 90 miles north of Kotzebue. The Port Site lies on the Chukchi Sea coast approximately 50 miles southwest of the mine (Figure 1), on lands owned by NANA Regional Corporation (NANA).

In accordance with Alaska Pollutant discharge Elimination System (APDES) Permit AK0040649 Part 2.2, the Permittee must develop and amend the BMP Plan consistent with the following objectives for the control of pollutants.

- The number and quantity of pollutants and the toxicity of effluent generated, discharged or potentially discharged at the facility must be minimized by the Permittee to the extent feasible by managing each waste stream in the most appropriate manner.

- Under the BMP Plan and any Standard Operating Procedures included in the BMP Plan, the Permittee must ensure proper operation and maintenance of water management, storm water management, and wastewater treatment systems. BMP Plan elements must be developed in accordance with good engineering practices.

- Each facility component or system must be examined for its waste minimization opportunities and its potential for causing a release of significant amounts of pollutants to Waters of the U.S. (WOTUS) due to equipment failure, improper operation, natural phenomena such as rain or snowfall, etc. The examination must include all normal operations and ancillary activities including material storage areas, storm water, in-plant transfer, material handling and process handling areas, loading or unloading operations, spillage or leaks, sludge and waste disposal, or drainage from raw material storage.

1.1 Scope and Application

The BMP Plan was intended to be consistent with the objectives of Permit Part 2.2.3 and the general guidance contained in *Guidance Manual for Developing Best Management Practices* (EPA 833-B-93-004, October 1993) and *Storm Water Management For Industrial Activities, Developing Pollution Prevention Plans and Best Management Practices* (EPA 832-R-92-006) or any subsequent revision to these guidance documents. The BMP Plan must include, at a minimum, the following items:

- Statement of BMP policy. The BMP Plan must include a statement of management commitment to provide the necessary financial, staff, equipment, and training resources to develop and implement the BMP Plan on a continuing basis.

- Structure, functions, and procedures of the BMP Committee. The BMP Plan must establish a BMP Committee responsible for developing, implementing, and maintaining the BMP Plan.

- Description of Activities. The BMP Plan must provide a description of the activities taking place at the site which affect or may affect storm water runoff or which may result in the discharge of pollutants to WOTUS during dry weather.

- Description of Potential Pollutant Sources. The BMP Plan must identify all activities and significant materials which may potentially be significant storm water pollutant sources or may result in the discharge of pollutants during dry weather.

This document covers all facilities and activities at the Port Site, the DMTS road, and the DMTS material sites that may reasonably be expected to be potential sources of water pollution. Storm water runoff associated with construction activities is not authorized for discharge under APDES Permit AK0040649, and as such, is not addressed in this BMP Plan.

The facilities and activities associated with Red Dog mine, 50 miles northeast of the Port Site (Figure 1), are also outside the scope of this BMP Plan.

This BMP Plan is a “top-level” document, and as such, does not attempt to provide a detailed description of all BMPs undertaken for water pollution prevention. Details may be provided in supporting documents which include the *Oil Discharge Prevention and Contingency Plan* (“C-Plan”), the intranet-based Red Dog Operations (RDO) Waste Information System (WIS), various Standard Operating Procedures (SOPs), inspection forms, training materials, etc. Additionally, water pollution prevention activities are coordinated within the framework of a formal environmental management system (EMS).

1.2 BMP Plan Format

The contents of the BMP Plan are intended to be consistent with the requirements outlined in APDES Permit AK0040649, Part 2.2.4. The format of the BMP Plan is as follows:

- Chapter 2 describes the environmental setting of the Port Site.

- Chapter 3 describes the major facilities and activities at the Port Site and along the Port Road. This chapter includes narrative descriptions of significant materials handling and storage, descriptions of control measures to reduce pollutants in storm water runoff, and descriptions of storm water treatment systems.

- Chapter 4 documents the process of determining the potential sources of water pollution at the Port Site and along the Port Road.

- Chapter 5 describes BMPs that may be used to prevent water pollution and minimize the environmental effects of water discharges.

- Chapter 6 discusses BMP implementation, and includes a statement of BMP policy and the structure, functions, and procedures of the BMP Committee.

- Figures 2, 3, and 7 through 17 (following the Plan narrative) provide site maps showing locations of facilities, locations of structural control measures to reduce pollutants in storm

water runoff, locations of surface water bodies, extents of drainage areas, and directions of drainage.

- Appendix A provides an inventory of significant materials, their locations, quantities, and methods of storage, and the likelihood of their exposure to storm water.
- Appendix B is a detailed risk identification summary of potential pollutant sources.
- Appendix C is a history of recent spills, including the materials spilled, locations, quantities, and causes.

2 Environmental Conditions

2.1 Climate

Located approximately 120 miles north of the Arctic Circle, the climate at the Port Site is extreme. Air temperatures can range from -50ºF in the winter to over 85ºF in the summer. Conditions are frequently windy. With freezing conditions prevalent through most of the year, storm water must typically be actively managed only during the months of May through September. Snow is actively managed during winter months.

Precipitation averages about 18 inches per year. February is usually the driest month and August the wettest. Snow is generally low in moisture content and this, combined with the high winds, can result in whiteout conditions and extensive drifting and scouring.

Cold, dry conditions in the winter result in sublimation and freeze-drying of exposed soils, making them highly susceptible to wind transport and air suspension, or dusting. Dusting is visible at times along gravel bars in the local rivers and from gravel pads around the Port Site.

2.2 Topography

The Port Site is located on the shore of the Chukchi Sea. The area in the immediate vicinity of the Port Site is dominated by coastal plain. However, the topography changes inland to moderately sloping hills, broad stream valleys and open expanses of tundra, eventually giving way to the DeLong Mountains, the western extent of the Brooks Range. The area is underlain by continuous permafrost and exhibits typical permafrost-related features, such as poorly defined surface undulations, patterned ground, thaw lakes, drainage channels and tussocks. A seasonal thaw layer (active zone) ranges from 20 inches below ground surface (bgs) in vegetated areas to 10 feet bgs in exposed rocky slopes and possibly up to 30 feet in disturbed areas.

2.3 Surface Hydrology

The Port Site is situated on the gently rising coastal plain on the shore of the Chukchi Sea. Site drainage flows toward the Chukchi and eventually enters one of three unnamed lagoons. Figure 2 shows the Port Site and local drainage patterns.

2.4 Biological Resources

Vegetation varies from dry upland mat and cushion tundra to wet lowland sedge-grass marsh. Rocky areas devoid of vegetation are infrequent.

Waterfowl, several passerine species, ptarmigan, shorebirds, and raptors are the primary birds found in the area. Brown bear, moose, musk-oxen and caribou are the primary large mammals and foxes and wolves are also found. Caribou migrate seasonally through the region. Several species of marine mammals and anadromous fish seasonally inhabit the Chukchi Sea.

3 Site Facilities

Construction of the Port Site was started in 1986 and the facility was commissioned in 1989 to support Red Dog mine. Zinc and lead concentrates produced at the mine are transported over the DMTS road to the Port Site, where they are stored in Concentrate Storage Buildings (CSBs) prior to being transferred to oceangoing vessels on the Chukchi Sea for shipment to market. Fuel, equipment, chemical reagents, operating supplies, and construction materials are delivered to the Port Site by barge, and transported over the DMTS road to the Mine Site. Major facilities at the Port Site include:

Concentrate facilities, including two concentrate storage buildings (CSBs), a truck unloading building (TUB), a surge bin, a conveyor system, a concentrate barge loader, and a CSB drainage treatment system; and

Ancillary facilities, including a personnel accommodation complex (PAC) and offices; a powerhouse/maintenance complex; water treatment and STPs; a bulk fuel storage facility; a maintenance shop; a solid waste landfill; a material site, a laydown yard; and a haul road.

A layout of the major Port Site facilities is shown on Figure 2. The following sections describe the facilities within the scope of this BMP Plan.

3.1 Concentrate Facilities

3.1.1 Concentrate Storage Buildings (CSBs)

Concentrates are delivered year-round to two CSBs. CSB-1 is 218 feet wide, 140 feet high and 1,425 feet long. CSB-2 is 218 feet wide, 140 feet high and 1,200 feet long. Together, these storage buildings can hold all of the concentrate produced in about 9 months of mill operation, allowing mine operations to proceed year-round, between shipping seasons. The CSBs protect the concentrates from the weather and protect the environment from fugitive dust emissions.

Each CSB contains a wash bay where heavy equipment leaving the buildings is thoroughly cleaned prior to exiting. The wash water is re-circulated for multiple washes. Spent wash water and settled solids are trucked to the Mine Site for processing through the mill.

CSB Wastewater Drainage Treatment System

Runoff from the area immediately surrounding the CSBs contains metals and has been characterized by the EPA as “mine drainage.” A CSB drainage treatment system, including a stormwater/groundwater collection system and an ion exchange (IX) plant, gathers and treats metals-laden mine drainage water before discharge into the Chukchi Sea through a pipeline along the conveyor alignment to an offshore underwater diffuser attached to Loading Cell 2 (Port Outfall 005). Snow collected within the CSB mine drainage area is stored within the CSB mine drainage area, and the resulting snowmelt is treated in the CSB wastewater drainage treatment system and discharged at Port Outfall 005.

The CSB drainage treatment system was constructed and installed in spring 2001, and its capacity was expanded during winter 2006-2007. The treatment system and expansion of the treatment system are described in further detail in sections 3.2.5 and 5.1 of this plan.

3.1.2 CSB Overburden Storage Area

The overburden storage area is located southwest of the CSBs. The area is used for temporary storage of excavated material and provides a potential storage area for snow collected outside the CSB mine drainage area (snow collected within the CSB mine drainage area is managed within the CSB mine drainage area as described in Part 3.1.2). The material in the overburden storage area includes overburden removed during the excavation of CSB-2 and rocky material excavated during the construction of the CSB drainage treatment system collection basins.

3.1.3 Truck Unloading Building

Specialized concentrate haul trucks unload concentrates at the TUB, located between the CSBs. Concentrates are unloaded by partially opening each trailer lid, then tilting the side-dump trailer body to deposit the concentrates into a hopper. The gradual manner in which the concentrates are dumped from the side-dump trailers into the hopper minimizes air displacement and dust generation during unloading. Nevertheless, the TUB is equipped with a baghouse dust collection system as described below.

The hopper that receives the concentrate feeds into a fully enclosed conveying system that carries it to one of two CSBs. When the trucks drive into the TUB to dump, the ore is dumped into the hopper which is a closed loop system. The system does not activate until the doors on both ends of the TUB are closed to minimize dust escapement. There is an air handling system in the hopper area and the system uses a negative pressure pickup system and a baghouse to collect fugitive dust, and filters the air before discharge. A portion of the discharged air is delivered back to the building to provide a ‘fresh’ air flow across the truck as it is dumping.

In 2017 an Air Knife Blower system was installed to act as an air wash to trucks exiting the TUB. This setup is similar to the dryer system in an automatic car wash that blows water off the vehicle while exiting. The blower system is activated as the exit door is opened. As trucks start to drive forward, any residual dust that may have accumulated on the ore trucks during the dumping process is directed back into the hopper. The exit door closes when the trucks have completely exited the building. The blower system continues to run for an additional 30 seconds after the door closes, so that the air handling system in the hopper can capture the dust blown off the ore trucks.

Concentrates are loaded from piles in the CSBs with front-end loaders and fed to rail-mounted feeder-hoppers. The feeder-hoppers transfer the concentrate to a conveyor system. The conveyors transfer the concentrates from the CSBs to the barge loader. Initially, the conveyor system was covered but not fully enclosed. In the summer of 1992, the conveyor from CSB-1 to the dock was enclosed with an industrial tent-like structure. During the construction of CSB-2 in 1996-1998, all of the conveyors associated with the buildings were enclosed. In 2001, the long conveyor from CSB-1 to the surge bin was enclosed in a steel tube. This main overland conveyor, P8, transfers the concentrates into a surge bin. This surge bin receives concentrate at a discontinuous flow rate and delivers it at a steady flow rate into conveyors P9A and P9B, which are twin variable-speed feeders, located underneath the surge bin. Finally, the concentrates are fed onto conveyor P10 and then P11, which is the barge-loader conveyor. The conveyor system is approximately 3,250 feet long. In the spring of 2002, the baghouse ducting at the surge bin underwent a major modification to improve dust control and ensure all dust was contained.

The fully enclosed barge loader conveyor can rotate to load to either the north or south side of the barge berth. The barge berth comprises three steel sheetpile cells, each about 66 feet in diameter. While at rest in the barge berth, lightering barges are loaded from the enclosed barge loader conveyor (P11) using a snout-like rubber tube that lowers into the barge to minimize the

free-fall distance of the concentrate. During the loading process, two front-end loaders work to distribute the concentrate evenly within the barge. The barge is covered during the entire process by fixed tarps except for a lengthwise slot through which the snout is lowered. The loaders work beneath the fixed tarps. In the first half of 2003, the barge loading system underwent a major modification to improve dust control. The modification included improved enclosures, belt cleaner, and an extensive baghouse system. Similar upgrades were made to each barge.

3.1.4 Ship Loading

Tugs are used to tow the concentrate barges from the relatively shallow water surrounding the dock to deep-sea vessels, anchored 3 to 5 miles offshore. Each barge has a built-in conveyor that transfers the concentrates to the deep-sea vessels. Two front-end loaders that reside on each barge are used to feed the built-in conveyors. The loaders work beneath fixed tarps. Prior to the start of the 2003 shipping season, the barges were modified to improve dust control. The modification included improved discharge chutes, better enclosures, and the installation of negative pressure systems and baghouses. Concentrates are transferred from the barge to the vessels as weather permits. Once the ships are loaded, they depart for customers around the world.

3.2 **Ancillary Facilities**

Due to the remote nature of the Port Site, its facilities include infrastructure not typically associated with industrial facilities. The major ancillary facilities are described in the sections that follow and are shown on Figure 2.

3.2.1 Personnel Accommodation Complex

A personnel accommodation complex (PAC) accommodates up to 96 people, and includes kitchen, laundry, emergency services bays, locker rooms and administrative offices. No industrial activities take place at the PAC. Domestic effluent is pumped to the sewage treatment plant (STP) for treatment.

3.2.2 Powerhouse Complex

The powerhouse provides electric power to all of the Port Site facilities. It is located east of the PAC. Annually the powerhouse burns approximately 600,000 gallons of diesel fuel in three 650-kilowatt and one 1,250-kilowatt generator sets powered by diesel-burning reciprocating engines. Heat is supplied to the Port Site buildings by waste heat recovery (heat exchange) units that utilize diesel engine cooling water to heat a propylene glycol/water mixture circulated by pumps. This heating system is backed up by two diesel-fired glycol boilers.

3.2.3 Drinking Water Treatment Plant

Water from the Chukchi Sea is drawn through two wells installed in the beach north of the conveyor, filtered to remove total suspended solids, and pumped up to the drinking water treatment plant located in the southwest corner of the powerhouse building. The water passes through a 20 micron cartridge filter and a sand filter prior to entering the desalination (desal) units where it undergoes reverse osmosis (RO) and chemical treatment. Sodium bisulphite and a flocculent are added to the desal units to inhibit growth of bacteria on the membranes and promote flocculation of particulates. Once the water leaves the desal units, calcium carbonate is added for pH adjustment and calcium hypochlorite (chlorine) is added using an automatic injection system

for sanitation and disinfection. After a final polishing stage, treated water is pumped into two potable water tanks for distribution to the PAC. The RO-reject water pipeline, the STP outfall (Port Outfall 001) pipeline, and the IX plant outfall (Port Outfall 005) pipeline join on shore and discharge through a common, submerged diffuser which is affixed to Loading Cell 2.

An average of 60 pounds of calcium hypochlorite is kept on hand in the potable water treatment plant. Additional supplies are ordered through the mine warehouse as needed. There is almost no potential for this substance to contact storm water.

3.2.4 Domestic Wastewater Treatment Plant

Sewage from the PAC enters a surge tank in the STP building, where soda ash is added with a chemical feed pump to raise the pH. The sewage then passes through the rotostrainer to remove large solids, and is aerated to provide biological activation. The effluent is then routed to a 12,000 gallon-per-day capacity Zenon “ZeeWeed” membrane treatment plant, where it is filtered through a membrane and treated with ultraviolet light before discharge. The Zenon plant is controlled by a programmable logic controller.

The STP was constructed in late 2000 and discharges effluent through Outfall 001 at an average annual rate of approximately three million gallons per year. This discharge occurs through a submerged pipeline fitted with a multi-port diffuser (Port Outfall 001), which allows rapid mixing with the ocean. The STP outfall (Port Outfall 001) pipeline, the RO reject pipeline and the IX plant (Port Outfall 005) outfall pipeline join on shore and discharge through a common, submerged diffuser which is affixed to Loading Cell 2.

In August 2011, the Alaska Department of Conservation (ADEC) was notified by Teck that it had begun using its own internally designed and fabricated sludge collection/drying system. The new system allows for the collection and drying of STP sludge in a much more efficient manner than was possible under the previous method. Further, sludge collection and drying processes utilizing the new system take place entirely within the confines of the STP building and therefore, remain entirely within secondary containment throughout the collection and drying processes. In addition to being much less efficient, the former sludge management system also introduced the potential for spillage at several steps of the process (e.g., pumping sludge from the STP to the transport vehicle, pumping sludge from the transport vehicle to the sludge press building, and during the dewatering procedures in the sludge press building)

The collected, dried biosolids are weighed and co-incinerated with other wastes (e.g., food, putrescible wastes). The ash is disposed in the solid waste landfill at Material Site 2 (MS-2) in accordance with the current Solid Waste Disposal Permit issued by ADEC.

Variations in STP operating parameters occur due to seasonal personnel changes. During the shipping and construction seasons, plant flow averages 8,500 to 9,500 gallons per day when approximately 80 to 90 people are housed in the PAC. During the winter season, when approximately 20 to 30 people occupy the PAC, flow averages about 2,500 gallons per day.

In the unlikely event of a bypass of the STP plant, representative sampling must be performed if the bypass may be reasonably expected to cause or contribute to a violation of permit effluent limits.

3.2.5 CSB Mine Drainage Wastewater Treatment System

Runoff from the area surrounding the CSBs is collected and treated in the IX plant, as regulated under APDES Permit AK0040649. The runoff contains metals and has been characterized by the EPA as mine drainage. The influent passes through columns containing a polymer resin, allowing metals in the water to exchange with weakly bound sodium ions. The pipeline carrying the treated industrial wastewater (Port Outfall 005) and the pipeline carrying the RO-reject water are joined by the pipeline carrying treated domestic wastewater (Port Outfall 001), and the combined effluent is discharged to the Chukchi Sea. Port Outfall 005 typically discharges during and immediately after runoff events. The actual amount discharged depends on seasonal and annual variations in precipitation.

The polymer resin beds in the IX plant are recharged as needed – based on plant performance or volume of water treated – by rinsing them with a sulfuric acid solution followed by a sodium hydroxide solution rinse. The spent acid and caustic solutions are transported to the mine in sealed totes or tanks and are treated in the Mine water treatment plant. Refer to Part 5.1 of this plan for more information about the IX plant and the CSB mine drainage treatment system.

3.2.6 Bulk Fuel Storage

The Port Site consumes approximately 4,500 gallons of diesel fuel daily for power generation, equipment operation, and vehicle use. Approximately 21 million gallons of fuel are shipped during the summer to the Port Site by barge and transferred to seven bulk fuel storage tanks at the Port Site. The Port Site fuel consumption is a small part of the total fuel consumption; most of the fuel is used at the Mine Site. Fuel is hauled from the Port Site tank farm to the Mine Site daily using a 25,000-gallon capacity tanker truck.

The seven fuel storage tanks are constructed of welded steel, above ground, in lined secondary containment. Tanks 1 through 6 each have a nominal capacity of 2.34 million gallons. Tank 7 has a nominal capacity of 3.3 million gallons. They meet the standards set by federal and state laws regarding spill contingency planning, including secondary containment, alarms, and leak detection systems. Descriptions of the design and operation of these tanks and their containment systems are available in the C-Plan.

Diesel fuel is distributed from the tanks by pipeline to the fuel-dispensing island and a day tank outside the powerhouse. The fuel-dispensing island consists of an enclosed pumphouse, an outside platform with a starter control panel, and a concrete pad on which the vehicles park while fueling. There are three hoses: a hose fitted with a twist- lock nozzle and Scully system for the tankers, a hose with a twist-lock nozzle and ball valve for concentrate haul trucks and other large equipment, and a hose with a squeeze-grip nozzle for light vehicles. The concrete pad is sloped toward the center and drains to a sump under the platform. The sump is designed to hold 110 percent of the tanker's individual compartments (5,000 gallons). As needed, a submersible pump transfers water and/or spillage from the sump into two containers (approximately 375 gallons each) beside the pump house. Absorbent pads, used to remove oily sheen from the surface of the water in the containers, are incinerated. Before the containers are full, a vacuum truck pumps out the water and transports it to the Mine for disposal.

3.2.7 Equipment Maintenance Shops/Wash Bays

A heavy equipment (HE) shop is located in the southwest corner of CSB-2, a millwright shop is located in the southeast corner of the powerhouse building, and wash bays are located at the

south end of each CSB. Welding and other fabrication work is conducted in the millwright shop and scheduled preventive vehicle maintenance and repairs are performed in the HE shop. Preventive maintenance tasks, inventory records, maintenance logs, and schedules are tracked in a database.

The wash bays are enclosed and constructed on concrete floors which drain to floor sumps. Sump sludge, mostly mud tracked into the buildings by mobile equipment, is pumped out of the sumps with the vacuum truck as necessary, transported to the Mine Site, and placed on ore stockpiles for recycling through the mill. Maintenance personnel routinely handle significant quantities of fuel, oil and other lubricants, battery acid, antifreeze, and cleaning products. These products are recycled, reclaimed, or disposed in accordance with the WIS. There are no floor drains or sumps in the HE shop or millwright shops. Dirt is swept up and disposed of as appropriate.

Hazardous waste from the shops is drummed and shipped off site in accordance with the Teck WIS (Part 3.2.9). Used oil is burned in a used oil heater unit in the warehouse (aka the “Dawg Shed”).

3.2.8 Incinerators

A refuse incinerator is used to co-incinerate food wastes from the PAC, dewatered biosolids from the STP, drained oil filters and oily absorbent pads, paper, and other combustible non-hazardous solid waste. The incinerator is located near the northeast corner of the PAC pad. Diesel fuel is burned to preheat and run the incinerator. Operation of the incinerator at the Port Site is regulated under an ADEC Air Quality Permit to Operate.

Incinerator ash is disposed in the port solid waste landfill in accordance with the current ADEC Solid Waste Disposal Permit.

3.2.9 Solid Waste Landfill & Waste Handling

The Port Site sanitary landfill is located at MS-2, and operates under the current ADEC Solid Waste Disposal Permit. The permit stipulates that only demolition debris, construction wastes, and ash or incinerator wastes may be disposed at the landfill. The landfill is operated by the port operations crew according to permit-specified stipulations regarding covering, grading, and working face size.

Solid waste is managed in accordance with the requirements of the Resource Conservation and Recovery Act (RCRA) and the Alaska Solid Waste Management Regulations (18 AAC 60). TAK’s policies and practices for waste management are detailed in the WIS. Operational control is provided by SOPs that are in use in work areas.

Dumpsters for solid waste collection are located near the PAC kitchen loading dock, near the south side of the powerhouse and at the east side of the heavy equipment shop. The dumpsters are marked as burnable, non-burnable and incinerable waste. Each employee is responsible for depositing solid waste in the appropriate container. Port Operations transports the dumpsters to the landfills.

The Port Site also uses a burn pit, located in the landfill at MS-2, for open incineration of wood pallets and paper products. Burn pit ash is landfilled according to the current ADEC Solid Waste Disposal Permit.

The WIS and a training and awareness program ensures that hazardous wastes are segregated and managed according to regulations under RCRA. Hazardous wastes are collected in properly labeled containers at satellite accumulation areas (SAAs), transported to the southwest corner of the heavy equipment shop laydown area, and stored in a locked connex. Hazardous wastes are sent to the Mine to be sorted, packed and shipped periodically by air or sea to an off-site disposal facility, and are tracked by a waste management system at the Mine Site.

3.2.10 Petroleum-Contaminated Soil Storage

Soil recovered from petroleum spill sites would be placed in a short-term storage container (a covered trailer) outside the TUB. These soils would be periodically transported in the covered trailer to the Mine Site and recycled in the mill process.

3.2.11 Laydown Yard

The laydown yard, located west of the bulk fuel storage area, is the major bulk materials storage location at the Port Site. The yard is used as storage for connexes containing reagents, other mill supplies, large heavy equipment parts, drums packaged for off-site shipment, HDPE liners, and other miscellaneous supplies. These materials are used at the port, or are staged at the port until transported to the Mine Site. All materials except oversize items are stored inside shipping connexes, which are watertight by design. Other areas for storage include the CSB-2 and MS-2 laydown areas, where equipment is periodically stored.

3.2.12 DMTS Road – DeLong Mountain Regional Transportation System

The DMTS road — also known as the port road or haul road — is the approximately 50-mile-long road between the mine and the port (Figures 4, 5, and 6). It is constructed of crushed rock and gravel over a geotextile liner. The road bed is 6 feet of pit-run material, topped by 1½ feet of 3-inch-minus subcoarse, and finished with approximately 6 inches of ¾-inch-minus surface coarse to complete the final grade. The road surface is approximately 30 feet in width, with turnouts situated at roughly 2-mile intervals. The DMTS road alignment includes nine bridges and three major culvert batteries, with an additional 445 minor culvert crossings. Minor culvert crossings facilitate natural surface runoff patterns when surface water is present. Major culvert batteries, consisting of multiple pipes in series, are located at major stream crossings that may experience flow year-round. Road traffic consists of concentrate haul trucks, fuel and freight trucks, maintenance equipment, and light vehicles.

Concentrate haul trucks in operation since fall 2001 have improved handling characteristics – which reduce the likelihood of rollover, and hydraulically closed steel covers to prevent dust escapement during normal transit or in the event of an accident on the DMTS road.

Operation and maintenance of the DMTS road is performed in accordance with the *DMTS Operating & Maintenance Plan*. Rock is crushed annually to replace surface coarse on the DMTS road. TAK's Surface Crew applies calcium chloride, snow, and/or water to the road surface on a regular basis to control dust. Graders, water trucks, snowplows, snow blowers, and loaders with straight blades are employed in the maintenance of the road.

To minimize the transport of sediment to streams at bridge crossings on the DMTS road, TAK's Surface Crew may implement the following techniques, in any combination, as appropriate for each particular bridge crossing: 1) enhance the crown of the DMTS road at the bridge approach (i.e., construct a "super-crown") to reduce the amount of sediment carried onto the bridge deck

by vehicles; 2) place sediment control and erosion control devices at a bridge approach; 3) install corrugated metal or other suitable splash guards on bridge guardrails during summer months to keep sediment on the bridge deck until it can be graded back on to the DMTS road; or, 4) periodic removal of bridge deck sediment. TAK is working to improve runoff prevention methods and to develop other techniques to improve sediment control at bridge crossings. The Port Road Management SOP will be updated accordingly with such improvements.

3.2.13 DMTS Material Sites

Material sites in the DMTS corridor provide a source of non-mineralized material (Figures 4, 5, and 6). The material sites provide a source for sand and gravel, rip rap, embankment fill, and surface coarse to operate and maintain the road according to its design specifications. There are two actively mined material sites, MS-2 and MS-9. Material Sites MS-3, MS-4, MS-5, and MS-6 are located within the Cape Krusenstern National Monument. With the exception of MS-6, material sites within the monument are currently in care and maintenance and have potential for future use. Material site reclamation has been initiated at MS-6. Four material sites (MS-2, MS-3, MS-9, and MS-10) are currently permitted for water withdrawal under an Alaska Department of Natural Resources (ADNR) Temporary Water Use Permit (TWUP). An area within MS-2 is permitted as a sanitary landfill under the current ADEC Solid Waste Disposal Permit. A portable crusher is operated intermittently at the active material sites. Emissions from this unit are regulated under Port Title V Permit No. AQ0289TVP03. Further details on the operation of the material sites can be found in the *DMTS Operating & Maintenance Plan*.

4 Identification of Potential Water Pollutants

Some facilities and activities at the Port Site have the potential to affect storm water. The following steps were undertaken to classify interactions between significant materials and storm water and to identify potential water pollutants associated with them:

1. An inventory was prepared of significant materials stockpiled, stored, and handled at the Port Site.

2. The Port Site was divided into sectors based on activity and drainage.

3. For each sector, potential interactions between significant materials and storm water were identified and evaluated to determine those with the potential to cause pollution associated with the discharge of storm water from the Port Site. The assessment considered the management of non-storm water discharges and the history of reportable spills at the Port Site, and available data on storm water quality.

This chapter describes the identification and evaluation process, and lists the potential storm water pollutants at the Port Site and along the Port Road. BMP are described in the following chapter.

4.1 Significant Materials Inventory

An inventory of “significant materials” (40 CFR 122.26(b)(12)) that have the potential to be released with storm water discharges has been developed for the Port Site. Significant materials at the Port Site include zinc and lead concentrates; fuel and other liquid and solid chemicals transported to the site as required for project operation; wastes such as domestic effluent and incinerator ash that are disposed of on site; and hazardous wastes that are stored prior to being shipped off site for disposal at a licensed facility. The significant materials inventory is provided in Table A.1, Appendix A.

Significant quantities of fuel, process reagents, and other materials must be stored at the Port Site as they can only be shipped to site during the brief open-water season, generally July to September.

4.2 Activity Sectors

To facilitate the evaluation of potential water pollutants and BMPs, the Port Site was divided into activity sectors. Sectors are loosely classified based on the activities within them, the significant materials present, the direction of surface drainage, and the extent to which drainage may be controlled by active or passive means. The major sectors are described below:

- CSB area: the area immediately surrounding the CSBs and the truck turnaround loop, where surface and groundwater drainage are intercepted by a system of ditches and processed by the IX plant prior to discharge through a diffuser into the Chukchi Sea at outfall 005.

- Port site west: concentrate surge bin and barge conveyor area, and ancillary infrastructure at the port, including bulk fuel storage area, laydown yard, PAC, powerhouse, incinerator, STP, drinking water treatment plant, dock, and barge loader. Surface drainage in this area is to wet and mesic tundra environs which ultimately drain to the near-shore lagoons.

- Material Site MS-2: a non-mineralized borrow source and landfill area sloped to form a basin and contain surface drainage.

- DMTS road, milepost 0 through 2: drainage from the DMTS road in this area is to mesic tundra environs.

- Areas northeast of approximately milepost 2 on the DMTS road (near MS-2) drain to mesic tundra environs, which ultimately drain to anadromous fish streams flowing to the Chukchi Sea.

- Non-mineralized material sites northeast of approximately milepost 4 of the DMTS road (MS-3 through MS-12) may drain to mesic tundra environs or rocky outcroppings, where they generally infiltrate/percolate and depart the surface water regime. Certain sites (MS-2, MS-3, MS-9 and MS-10) are permitted to store water for use in dust control along the Port Road.

4.3 Potential Water Pollutants

In this document, potential water pollutants are defined as those likely to be present in water discharges associated with industrial activity or storm water at the Port Site.

Potential water pollutants were identified using a risk-based approach, as follows:

1. For each Port Site sector, distinct facilities and activities were identified.

2. For each facility, potential interactions between significant materials (possible sources of storm water pollution) and storm water were identified, under both normal operating conditions and abnormal conditions (i.e., spills or other unplanned incidents).

3. Water pollutants associated with each interaction were identified.

4. For each interaction, a qualitative assessment of the relative risk of polluting storm water was conducted. This assessment was based on the general toxicity of the material involved, the quantity of it available to cause pollution, the likelihood of contact with storm water and the probability of occurrence of the interaction. The result was a ranking, on a scale of 1 to 5, of the risk of each interaction causing pollution to storm water discharged from the Port Site. Pollutants associated with interactions ranked 1 or higher on the risk scale were designated as potential water pollutants.

The risk ranking procedure is described in more detail in Appendix B. Table B.1 shows the results of the risk ranking and lists the potential water pollutants that have been identified at the Port Site.

4.4 Non-Storm Water Discharges

Non-storm water discharges include domestic waste water from the PAC, which is treated and discharged via Port Outfall 001 and CSB drainage, which is treated and discharged via Port Outfall 005. Outfall 001 line and Outfall 005 lines merge downstream of the STP and discharge into the Chukchi Sea.

4.5 Spills and Leaks

Spills and leaks of significant materials that are most likely to occur at the Port Site and along the DMTS road in significant quantities are 1) Concentrate spills on or adjacent to the DMTS road due to concentrate haul truck overturning; 2) Diesel fuel spills on and adjacent to the DMTS road due to tanker truck overturning; and 3) Diesel fuel spills at the Port Site bulk fuel storage tanks or at the fuel-dispensing island (spills in both cases would be captured by secondary containment systems).

An inventory of past reportable spills and leaks for November 2010[1] through December 2023 is included as Appendix C. This information was used in the risk assessment for identifying potential water pollutants to help quantify the likelihood of occurrence of interactions associated with normal and abnormal operating conditions (Appendix B).

5 Best Management Practices

This chapter describes the specific BMPs which TAK may implement at the Port Site, on the port road, or at material sites to eliminate or minimize pollutant levels in permitted discharges and to minimize contact between potential pollutants and storm water. The BMPs may be facility-specific, process-specific, or general in nature.

5.1 CSB Mine Drainage Control and Treatment

Runoff water/groundwater around the CSBs is collected with a ditch system (the lower portion of which also serves as a retention basin) surrounding the CSBs (Figures 2 and 3). This ditch system was designed to maintain the level of storm water and intercepted groundwater below the foundation of the CSBs. The system consists of a ditch along the western side of CSB-1, connected by a culvert to a ditch surrounding CSB-2. From the CSB-1 ditch, pumps move the water to the IX plant to remove metals.

As the result of a flood event in 2001 that caused a bypass of the IX plant, the configuration and operation of the CSB drainage control system were re-evaluated. In summer 2002, a floodgate was installed to control movement of water from the CSB-2 area to the CSB-1 area, increasing the effective storage capacity of the system, and “trash” pumps are used for pump-back from the CSB-1 area to the CSB-2 area to retain drainage until IX treatment.

During treatment, CSB drainage is ideally allowed to settle prior to being pumped to the IX plant where it is filtered through bag-filters prior to passing through Purolite™ polymer resin columns, which allows metals in the drainage to exchange with weakly bound sodium ions on the resin, reducing metals concentrations in the water to permissible limits The columns are recharged as needed, first by treatment with a sulfuric acid solution to remove zinc and lead from the resin, then by treatment with a sodium hydroxide solution to return the resin to its original state by adding sodium ions. Both the sulfuric acid and sodium hydroxide rinsates are transported to the Mine Site and processed through the mine water treatment plant.

[1] First full month following October 31, 2010, the date that ADEC assumed authority for permitting, compliance, and enforcement for wastewater discharges from mining activities in Alaska,

The IX plant, installed in spring 2001, consisted of a single treatment train. During winter 2006-2007, two additional IX treatment trains were added to the IX plant, effectively tripling the plant's maximum treatment capacity.

The IX plant may be run in parallel mode (typically at higher flow rates, with less metals removal) or series mode (typically at lower flow rates, with higher metals removal). Plant evaluations after the 2001 bypass event showed that the plant could be operated in parallel mode, increasing its effective treatment capacity, and still produce effluent that meets the APDES permit limits. In the high-flow parallel mode, a single treatment train is able to treat 250 gallons per minute (gpm) of effluent. Under the low-flow series mode, a single treatment train will produce 150 gpm of effluent. With the IX plant running at full capacity, the containment system has the capacity to handle an approximately 750 gpm of effluent in high-flow parallel mode and approximately 450 gpm of effluent in low-flow series mode. The treatment system is estimated to have the capacity to handle a 10-year 24-hour precipitation event without a bypass of the IX plant.

CSB drainage is discharged to the Chukchi Sea under APDES Permit AK0040649 from Port Outfall 005 to a pipeline connecting to the offshore diffuser located on Cell 2. Permit limits for discharge to the Chukchi Sea via port Outfall 005 are listed in APDES Permit AK0040649, Part 1.3.1, Table 3.

Discharge monitoring (sample collection and analysis) is conducted in accordance with the *Quality Assurance Project Plan - Water Quality Monitoring Program DMTS Port Facility*, as required by APDES Permit AK0040649, Part 2.1. In the event of a bypass of the IX plant, representative sampling must be performed if the bypass may be reasonably expected to cause or contribute to a violation of permit limits listed in APDES Permit AK0040649, 1.3.1, Table 3.

The APDES permit does not stipulate maximum flow rate or volume limits for Outfall 005 water discharged to the Chukchi Sea. Actual discharge flow rates and volumes depend upon seasonal and annual variations in precipitation as well as IX plant capacity.

5.2 Erosion and Sedimentation Control

5.2.1 Port Site

Measures for control of erosion and sedimentation are applied on an as-needed basis, generally to areas that do not drain to the CSB drainage control system. Such measures may include one or more of the following, as appropriate:

Erection of silt fences;

Placement of fiber roll barriers, rolled erosion control products (RECP) or other similarly appropriate sediment control materials;

Establishment of new/utilization of already existing vegetative buffers;

Construction of:

Diversion berms

Drainage ditches

Side ditches and drains

Water bars

Settling ponds

Temporary silt basins

Revegetation of disturbed areas;

Small-scale diversion of clean water around disturbed areas.

Erosion and sedimentation control within the CSB drainage area includes rip-rap on cut slopes to minimize the potential for erosion and thermal degradation of the permafrost. Disturbed areas such as the CSB-2 laydown area and roadways around the CSBs are gently sloped toward the drainage control ditch system to minimize overland sheet flow velocity and prevent erosion.

5.2.2 Port Road and Bridge Crossings

Measures for control of sedimentation at bridge crossings on the DMTS road may include one or more of the following, as appropriate:

Enhancement of the crown of the DMTS road (construction of a super-crown) at approaches to bridges to reduce the amount of sediment carried by vehicles onto the bridge decks;

Placement of silt fencing or other erosion control devices at the approaches to bridges;

Installation of splash guards on bridges during open water months to keep sediment on the bridge decks until it can be graded back on to the DMTS road;

Periodic cleanout of bridge decks.

5.2.3 Material Sites

The placement and type of drainage control features associated with the disturbed areas of the material sites is unique to each material site and is dependent on the current pit configuration and the potential future use of the material site. Erosion control features may include drainage ditches with a series of dikes and filter cloth forming settling ponds, silt fences, rip-rap, contouring, and other control features when needed. In addition the pit floor may be excavated to form a water storage impoundment with the final grade of the pit floor sloped to drain to the storage pond. Revegetation may be used as an additional erosion control method on long-term inactive material sites and access roads.

Figures 7 – 17 depict locations of structural control measures to reduce pollutants in storm water runoff (where applicable), locations of surface water bodies, extents of drainage areas, and directions of drainage for material sites MS-3, 4, 5, 6, 7, 8, 8A, 9, 10, 11, and 12 respectively.

5.3 **Fugitive Dust Control**

Mineralized fugitive dust at the Port Site presents a potential contamination threat to storm water and receiving water quality. The major potential sources of metal-bearing fugitive dust are concentrate haulage on the DMTS road and concentrate storage and handling at the Port Site.

Particulate air emissions have been identified as one of 19 unique significant aspects under Red Dog's EMS. Red Dog's EMS is described in Part 6.3. Continuous improvement in fugitive dust control performance is sought through management of control efforts under a formal environmental management program (EMP).

A variety of measures are in place to control and minimize fugitive dust emissions at the Port Site. These include control procedures conducted under various SOP documents such as the *Shiploader Guide SOP* and engineering controls such as the full enclosure of concentrate storage piles, conveyors and transfer points; baghouses and other engineering controls in the TUB, surge bin, barge loader and other transfer points; and use of specially designed concentrate haul trucks covered with self-sealing hard tops.

Road dust control is performed by TAK's Surface Crew according to the *Dust Control on Port Road SOP*. Generally, the Surface Crew waters roads during dry periods in the summer, applies calcium chloride to roads during fall and spring (when temperatures are below freezing but above 0ºF), and applies snow to roads in the winter. The rationale for TAK's selection of calcium chloride as a dust-suppression palliative is discussed in the *DMTS Operating & Maintenance Plan* section 4.1.3.

5.4 Waste Management

Solid and hazardous wastes are managed according to the regulations promulgated under RCRA and the Alaska Solid Waste Management Regulations (18 AAC 60). Waste management policies and practices are summarized in Part 3.2.9 and are detailed in Red Dog's WIS. Operational control of waste management activities is covered by SOPs in use in operating areas.

5.5 Fire Suppression System Test Water Management

The Port Site's 50,000-gallon fire suppression system uses only fresh potable water stored in a system-specific tank. Small sectors of the system are drained for occasional maintenance (up to once per year) through hydrants to Port Site pads. The sectors are drained at controlled rates to locations on port pads such that system water infiltrates and does not flow off pads.

5.6 Good Housekeeping

TAK implements good housekeeping practices at the Port Site to maintain a clean and orderly work environment. Materials are stored carefully, all containers are labeled per applicable regulations, and an up-to-date chemical inventory is maintained. Incompatible materials are stored separately according to SOPs for hazardous materials management. Routine cleanup operations are scheduled in all work areas and employees are trained in good housekeeping practices.

A "spring cleanup" is conducted each year in June once the snow has melted. Trash and scrap items that may have been covered by snow during the preceding winter months are identified and properly disposed of.

Storm water accumulating within the bulk fuel storage secondary containment area is checked visually for sheen and, if no sheen is present, is pumped out and discharged to the ground surface. If sheen is present, the sheen is removed with absorbent pads before the water is pumped and discharged.

5.7 Preventive Maintenance & Repairs

Periodic preventive maintenance (PM) is conducted in all work areas to prevent mechanical failure. PM activities may be calendar-driven (carried out on specific dates regardless of equipment usage) or run-time driven (carried out when a preset threshold of equipment usage is reached). Specific PM information is maintained by the Maintenance Department using a computer inventory and maintenance software program. The program includes automatic maintenance work order (MWO) generation for PM activities, inventory records, maintenance logs and maintenance schedules. The PM cycle is re-initiated automatically when an MWO is closed by the maintenance planner. Electronic PM records are retained for at least five years.

Scheduled PMs are supplemented by routine facility inspections to detect problems that could lead to failure between scheduled PM activities. Repairs are made based on PMs and as needed, according to applicable manufacturer specifications.

5.8 Inspections and Corrective Action

Permit Part 2.2.4.5.8 requires qualified personnel to inspect BMPs and designated equipment and facility areas at least on a monthly basis during the period from May through October, and at least quarterly during the period from November through April. However, inspections are not required when adverse weather conditions make a location inaccessible. Inspections must include, at a minimum, all material handling and storage areas, wastewater and storm water control and containment structures, and erosion control systems.

Permit Part 2.2.5 requires qualified personnel to conduct a comprehensive site compliance evaluation no less than once per year. Such evaluations must include:

- Site Evaluation: Areas contributing to wastewater and storm water discharges and areas susceptible to leaks or spills must be visually inspected for evidence of, or the potential for, pollutants entering the permitted outfalls, storm water drainage system, or WOTUS. Structural and non-structural BMPs and other measures to reduce pollutant loadings must be evaluated to determine whether they are adequate and properly implemented. An inspection of equipment needed to implement the BMP Plan, such as spill response equipment, must be made.

- Updates and Revisions Based on results of the site evaluation and inspection, the BMP Plan must be revised, as appropriate, within 30 days of such inspection and must provide for implementation of any changes to the BMP Plan in a timely manner, but in no case more than 90 days after the inspection.

Each activity sector described in Part 4.2 shall be visually inspected for evidence of, or the potential for, pollutants entering adjacent drainage systems. The inspection schedule is that initially described in this section, with the following exceptions:

- Spill response equipment is inspected monthly by the Port Medic;

- Sections of the DMTS road are regularly checked on a year-round basis by the Surface Crew for dust suppression purposes;

- DMTS road bridge crossings are informally inspected on a year-round basis by the Surface Crew

- The Environmental Department performs quarterly inspections of bridge crossings during the period November through April, and monthly during May through October;

- Material sites MS-3, MS-9, and MS-10 are inspected monthly from May through October (active material sites and/or water withdrawal sites),

- Material sites MS-4, MS-5, MS-6, MS-7, MS-8, MS-8A, MS-11, and MS-12 are inspected at least once during the open water season (inactive material sites that are not water withdrawal sites)

Routine inspections are the responsibility of the respective departmental supervisors. Inspection of secondary containment and leak detection devices is the responsibility of Port Operations. The secondary containment inspection checklists include a secondary containment log and secondary containment pumping sheet. Routine inspection of spill response equipment is performed by the Response Chief or their designee. Port Site storm water inspections (including material sites inspections) are performed by the Environmental Coordinator-Stormwater or their designee.

If an inspection reveals that corrective action is needed, corrective action shall be initiated within 30 days of the inspection or as soon as practicable under extenuating circumstances. ADEC must be notified within 15 days of the inspection of extenuating circumstances.

The scope of routine inspections, including inspection dates, personnel who made the inspections, and corrective actions taken as a result of the inspections, must be summarized in an Annual BMP Report (Part 2.2.6), which is reviewed and certified by the Red Dog Port Site BMP Committee and submitted to ADEC. Corrective actions must be included in updates to this BMP Plan.

5.9 Spill Prevention and Response

Red Dog's C-Plan details TAK's programs for prevention of and response to spills of oil and fuels. The C-Plan conforms to AS 46.04 and 18 AAC 75, is approved by the ADEC and incorporates a Facility Response Plan (FRP). The C-Plan has been approved by the U.S. Coast Guard under 33 CFR 154. TAK's Spill Prevention Control and Countermeasure (SPCC) Plan also describes certain measures implemented to prevent and to respond to oil discharges. The SPCC Plan was developed and is certified by a Professional Engineer, per 40 CFR 112.

TAK's *Red Dog Hazardous Material Operations Manual* provides guidance to TAK Fire Department personnel who respond to emergency situations where a release or potential release of a hazardous substance is present. The manual covers general response, cleanup, disposal, and reporting methods for spills of bulk chemicals used in the mining and milling process and transported through the port and over the DMTS road. This manual is reviewed periodically and updated as needed.

Primary responsibility for implementing these plans lies with Safety and Health and the Response Chief.

5.10 Training Programs

Part 2.2.4.5.9 of APDES Permit AK0040649 requires the BMP Plan to outline employee training programs related to implementation of the BMP Plan and specify how often training will take place. The following three basic areas of training are provided to employees and described in the

following subsections: annual general environmental training, job-specific environmental training, and spill prevention and response training. Annual general environmental training is provided to employees based on their date of hire. Job-specific environmental training is conducted when an employee is hired and reinforced during safety meetings. Job-specific environmental training is conducted when the environmental requirements for a job evolve (e.g., as a result of new permit requirements or regulatory changes). Employees responsible for specific spill response roles or duties are trained during weekly fire department training sessions combining firefighting and spill response instruction.

General Environmental Training

General EMS awareness training ensures that all employees have a base level of understanding regarding the environmental issues/risks associated with RDO, and how these issues and risks are managed and controlled. Training objectives include:

Awareness of RDO environmental policy and understanding of the environmental commitments included in the policy (e.g., prevention of pollution, continual improvement, and compliance with applicable laws and regulations).

Awareness of RDO significant environmental aspects;

Awareness of key personnel and departments involved in the EMS;

Awareness of environmental objectives/targets and EMPs;

Awareness of environmental worksheets and associated operational controls;

Understanding the use of the Corrective Action Program; and

Awareness of basic EMS knowledge requirements tested during an EMS Audit.

General EMS awareness training ensures that all employees are familiar with the tools available to them to meet Red Dog's EMS and environmental compliance commitments. The employee training objectives for the EMS awareness training component of this module include:

Understanding of the basic components and information contained within the WIS to effectively manage wastes from generation through to disposal (Waste Finder, Waste Guidelines, forms and checklists, SOPs, and an overview of waste management basics); and

Awareness of the basic tools and components available within the EMS component of the Environmental Management Information System (worksheets, WIS, Tag Board, EMS Tasks, Corrective Action Program, Recent Incidents, Training, and Links).

The general environmental awareness training component ensures that all employees are aware of basic environmental requirements that must be factored into all routine and non-routine activities conducted at, and on behalf of, RDO. The employee training objectives for the environmental component of this module include:

Awareness of Red Dog's waste segregation, housekeeping, disposal, and recycling requirements;

Awareness of wildlife policies that limit or control interactions that may affect personnel health and safety, as well as disturbance, preservation, and local subsistence concerns;

Awareness of the requirements to protect cultural artifacts and resources;

Awareness of “highly regulated” activities common to the operation;

Understanding of incidents that impact the environment;

Awareness of the incident notification and reporting process; and awareness of basic Emergency Response activities.

5.10.1 Job-Specific Environmental Training

The intent of job-specific environmental training is to ensure that personnel engaged in jobs or tasks required by the EMS are knowledgeable about their work, area-specific environmental issues, and what specific tasks are required to manage environmental performance. Job-specific training will normally apply to operational-level personnel. Operational-level personnel with “front-line” responsibilities who are involved in operating equipment or machinery, conducting routine inspections, and monitoring environmental indicators must be trained in the appropriate procedures for performing these work activities. Job-specific training includes

Significant environmental aspects associated with specific job tasks;

Established environmental objectives and targets, and EMPs involved with specific job tasks;

Specific roles and responsibilities for job tasks related to environmental compliance;

Established operational procedures (SOPs, checklists, environmental worksheets);

Established emergency preparedness and response requirements; and

Materials management, good housekeeping, and waste management procedures.

This type of training is generally practical and specific to a particular functional group. Job-specific training provides the training necessary to achieve the competency required by Clauses 7.2 and 7.3 of the ISO 14001:2015 standard.

5.10.2 Spill Prevention and Response Training

Spill prevention training is given to all employees during General EMS training. Additional prevention training is given to specific departments on an as-needed basis in areas where there are recurring spills. On-the-job training is performed on tank farm alarms and response procedures, fuel tank inspections and valve inspection procedures.

TAK has an Emergency Response Team that is trained to respond to emergencies, including major spills, at Red Dog. The C-Plan (Part 5.9) is fully exercised every three years. At a minimum, emergency and spill response personnel receive at least 24 hours of training, including the following:

Classification, identification and verification of known and unknown materials by using field survey instruments and equipment;

Selection and proper use of specialized chemical personal protective equipment;

Performing advance control, containment, and confinement operations within the capabilities of the resources and personal protective equipment available;

Understanding basic chemical and toxicological terminology and behavior; and

Potential health and fire hazards associated with spill response activities.

5.11 Site Security

The Port Site is remote and not readily accessible to the general public. The property is not fenced, but signs prohibiting unauthorized entry are posted along the access road and at the property boundaries. The airstrip near the Mine Site is private and is not accessible for public use without prior permission, and the DMTS road is restricted to authorized industrial use. Overland access is possible by snow machine or all-terrain vehicle, and access by water is possible by boat.

Access to the Port Site and DMTS road is controlled in accordance with the *DeLong Mountain Regional Transportation System Port Facility Pubic Access Control Plan*, which designates safety zones and public access routes, and sets forth policy for managing unauthorized traffic.

Port Facility Management under the direction of RDO's Safety and Health Department is responsible for the safety and security of personnel. Law enforcement responsibilities are delegated, as needed, to Alaska State Troopers in Kotzebue.

5.12 Drug & Alcohol Policy

TAK has a long-standing commitment to maintaining the highest standards possible for the health and safety of its employees, customers, clients, and the public at large. The use of or impairment by drugs and/or alcohol during work time is contrary to these high standards and will not be tolerated. Illegal drugs and alcohol are prohibited at TAK's Mine Site and Port Site facilities. If any personnel are found to be in possession or under the influence of alcohol or illegal drugs, immediate dismissal from assigned duties is required.

The purpose of this Drug and Alcohol Policy is to maintain the highest safety, health, and work performance standards possible, and to reduce work-related accidents, injuries, and damage which may be caused by use of or impairment by drugs or alcohol. This policy is intended to ensure the maintenance of productivity, the quality of products and services, and the security of property. This policy covers any prospective employee or employee of TAK and all contractors providing services to the Red Dog Operation. The company will test employees for drugs and/or alcohol under the following conditions: pre-employment, post-incident, unannounced random testing, and under reasonable suspicion. Compliance with this policy is a condition of employment. Refusal to take a required drug or alcohol test, yielding a positive drug or alcohol test, or engaging in an activity or behavior which otherwise violates this Policy shall, at a minimum, result in removal from performing assigned functions. Additional disciplinary action may follow, including termination.

6 Best Management Practices Implementation

6.1 Best Management Practices Committee

Implementation of BMPs for water management is the overall responsibility off the BMP Committee. The BMP Committee consists of the following positions or their designees:

- Manager, Concentrator, Tailings & Environment
- Port Operations Coordinator
- Superintendent, Materials Management
- Mine General Supervisor
- Mine Principal Engineer
- Surface Supervisor
- Response Chief
- Environmental Coordinator – Stormwater (Committee Chair)

The duties of the Committee Chair are to

Develop the draft BMP Plan or revise it, as necessary;

Develop the final BMP Plan with consensus from the BMP Committee; and

Chair BMP Committee meetings.

The BMP Committee will:

Review and comment on the draft BMP Plan, calling attention to any inaccuracies or deficiencies, and offering suggestions for improvements;

Assist in BMP Plan implementation as it pertains to their department's responsibilities;

Advise the committee chair of any process or operational changes in their respective departments that require consideration in the BMP Plan, and meet to revise or modify the plan as necessary;

Endorse the BMP Plan and review and endorse the Annual BMP Report as required by APDES Permit AK0040649, Part 2.2.6;

Submit a certified statement that a review of the Annual BMP Report has been completed and that the BMP Plan fulfills the requirements set forth in APDES Permit AK0040649; and

Incorporate the BMP Plan into internal audits.

6.2 Statement of BMP Policy

TAK has adopted the following Environmental, Health, Safety and Community Policy:

> Red Dog Operations, one of the world's leading producers of zinc concentrate, demonstrates that mining is compatible with the values of the Inupiat of Northwest Alaska. Teck Alaska Incorporated operates the mine and port under unique agreements with the NANA Regional Corporation, the land owner.
>
> Teck and NANA are committed to the protection of the environment and subsistence resources, and facilitating and enhancing sustainable benefits within Northwest Alaska. We value the safety of our employees, contractors and the public and are committed to protect them from the hazards of our operations. Red Dog Operations relies on individual and collective behavior of its people to meet these objectives. We believe all incidents that could cause serious harm to our employees and contractors are preventable. We expect all employees and contractors to be leaders in health and safety through identification of hazards and the elimination and control of high potential risks.
>
> To minimize the impact of the Operation on subsistence resources, the environment and biodiversity; to minimize hazards in the workplace; and to expand our mutual understanding of stakeholder interests and concerns, Red Dog Operations commits to:
>
> - Provide a safe workplace, effectively managing workplace risk and providing leadership and resources for managing health and safety;
> - Prevent pollution and reduce waste;
> - Engage proactively with stakeholders through open and transparent dialogue;
> - Continual improvement in the identification of environmental, health, and safety risks and eliminate, isolate, or mitigate the risks that could injure or harm people, the environment, local communities, or subsistence resources; circumstances
> - Comply with all environmental, health and safety regulations, permits, legal, and other environmental, health, safety, and community commitments;
> - Ensure that all employees, contractors, suppliers, partners, visitors, and other third parties adhere to the Red Dog Operations environmental, health, safety, and community management standards;
> - Consider and recognize Inupiat values, culture, and resources in our decision making processes through engagement with members of the community;
>
> To achieve these commitments, Red Dog Operations establishes environmental, health, safety, and community engagement goals and measures our performance against those goals.
>
> We all share in the responsibility for our safety and that of our co-workers.

In addition to its Environmental Policy above, TAK will:

Ensure planned modifications to the facility are reviewed such that the requirements of the BMP Plan are considered as part of the modifications; and

Provide the necessary financial, staff, equipment, and training resources to develop and implement the BMP Plan on a continuing basis.

6.3 Environmental Management System

TAK has developed and implemented a formal EMS, encompassing operations at the Mine Site and the Port Site. The EMS has been certified as conformant to the ISO 14001:2004 EMS standard.

The EMS development included a comprehensive exercise to identify and rank Red Dog's environmental aspects[2]. Over 1,300 environmental aspects were identified across all work areas and activities. Of these, approximately 230 were ranked as "significant"[3] on the basis of a risk assessment.

For the purposes of prioritizing management activities in the form of EMPs, the significant aspects were grouped according to category into "unique" environmental aspects, that is, aspects associated with a common activity and/or environmental impact. There are 19 unique significant aspects at Red Dog Operations, associated both with abnormal conditions (e.g., a spill or other environmental incident) and normal operating conditions.

Storm water runoff is a unique significant aspect under both abnormal and normal conditions and as such, will be managed and tracked as part of a formal EMP. Several other significant environmental aspects can be directly or indirectly related to storm water management and potential effects on receiving water quality at the Port Site. These are listed below:

Emissions to air – particulates (mist and fugitive dust)

Handling and storage of dangerous substances

Hazardous waste generation

Land disturbance

Leaks and spills to land

Leaks and spills to water

Management of waste with special considerations

Solid waste generation

[2] An environmental aspect is defined in the ISO 14001:2015 Standard as an "element of an organization's activities, products or services that can interact with the environment".

[3] Significant aspect is defined in the ISO 14001:2015 Standard as an environmental aspect that has or can have a significant environmental impact.

Waste water discharge – point source

The EMS provides a structured framework for managing significant aspects as they relate to water discharge and storm water management, and for managing BMP incidents and corrective actions.

6.4 BMP Plan Documentation

6.4.1 Plan Location and Public Access

Electronic copies of the BMP Plan and APDES Permit AK0040649 are maintained in Qualtrax, the Red Dog Operations' document control system. Through Qualtrax, electronic copies of the Port's BMP Plan and APDES permit are available to DEC upon request and for review and/or printing from virtually any company desktop computer at the Port.

6.4.2 Annual BMP Report and BMP Plan Certification

APDES Permit AK0040649 Part 2.2.6, requires an Annual BMP Report. The report must include the scope and dates of the inspections/evaluations, major observations related to implementation of the BMP Plan, corrective actions taken as a result of the inspections/evaluations/monitoring, description of the quality of storm water discharged, and BMP Plan modifications made during the year. The report must also identify any incidents of non-compliance. The report must be retained as part of the BMP Plan and submitted to DEC by March 1 of the next year with the Annual Report.

The Permittee must prepare a certified statement that reviews (inspections and evaluations) required by the permit have been completed and that the BMP Plan fulfills the requirements set forth in the permit. This statement must be signed in accordance with Appendix A and submitted to DEC by March 1 of the next year with the Annual Report.

6.4.3 Recordkeeping and Reporting

Records of inspections, corrective actions and preventive maintenance, and spill reports will be maintained at the Port Site or in the Environmental File system located at the Red Dog Mine site for at least one year after the expiry of APDES Permit AK0040649.

6.4.4 Plan Modifications

This BMP Plan will be amended

- Whenever there is a change in the facility or in the operation of the facility which materially increases the generation of pollutants or their release or potential release to surface waters.

- Whenever it is found to be ineffective in achieving the general objective of preventing and minimizing the generation and the potential for the release of pollutants from the facility to the WOTUS and/or the specific requirements of the permit.

Any changes to the BMP Plan must be consistent with the objectives and specific requirements of Permit Part 2.2. All changes in the BMP Plan must be contained in the BMP Plan Annual Report required under Permit Parts 1.7.

Amendments to the BMP Plan are subject to ADEC review, and they shall be kept on site and made available to ADEC upon request.

Table A.1: Red Dog Port Site Inventory of Significant Materials

Material	Description	How Stored	Primary Location	Quantity in Storage	Exposed to Storm Water?		
					Storage	Handling	Transport
Mine Products							
Construction rock	Non-mineralized borrow material	Open stockpiles	Material site MS-2	<5,000 cy	Yes	Yes	Yes
Concentrate	Finely ground rock, concentrated payable minerals (sphalerite, galena), filtered to approximately 9% moisture	Enclosed stockpiles	Concentrate storage buildings (CSB-1 & CSB-2)	500,000 t (avg) combined lead and zinc con	No	No	No
Fuel, Oil, Grease, Antifreeze, Solvents							
Diesel fuel	No. 1 & No. 2	Tanks	Seven above ground storage tanks	8 million gallons (avg)	No	No	No
Unleaded gasoline		Drums, Iso tanks	Connex in laydown yard	6000 (avg)	No	No	No
Lubricants	Miscellaneous lubricants oils, greases	Drums, cans, pails	maintenance shops	60,100 lbs (avg)	No	No	No
Hydraulic oil	Hydraulic oil	Drums	maintenance shops	4,700 lbs (avg)	No	No	No
Ethylene glycol	Ethylene glycol-based antifreeze products	Drums	maintenance shops	3,300 lbs (avg)	No	No	No
Propylene glycol	Propylene glycol-based antifreeze products	Drums	maintenance shops	800 lbs (avg)	No	No	No
Solvents	Miscellaneous solvents & degreasers	Drums	maintenance shops	1,750 lbs (avg)	No	No	No

Table A.1: Red Dog Port Site Inventory of Significant Materials

Material	Description	How Stored	Primary Location	Quantity in Storage	Exposed to Storm Water?		
					Storage	Handling	Transport
Process Reagents, Water Treatment Chemicals, Misc. Chemicals							
Acid	Sulfuric acid solution used in ion exchange plant (to strip metals from resin columns)	Totes	Spill tent in laydown yard	600 gallons (avg)	No	No	No
Ammonium Nitrate	Blasting Agent	Connexes	Pass through item, temporary storage at MS-2	n/a	No	No	No
Ammonium Nitrate, Fuel Oil & Emulsion	Blasting Agent	ANFO Truck	Stored at Mine Site until needed at material sites	40,000 lbs (avg) on day of use only	No	Yes	No
Calcium carbonate	pH adjustment of treated water	Bags	Potable water treatment plant	100 lbs (avg)	No	No	No
Calcium hypochlorite	Sanitation and disinfection	Drums	Potable water treatment plant	60 lbs (avg)	No	No	No
Chlorine	Backwash STP membrane	Buckets	Sewage treatment plant	55 gallons (avg)	No	No	No
Copper sulfate	Mill process reagent	Bags	Laydown yard	n/a	No	No	No
Dextrin	Mill process reagent	Bags	Pass through item only	n/a	No	No	No
Flocculant	Vanfloc in STP and Flocon 100 to promote flocculation and antiscalant in desalination membranes	Bags / Buckets	Sludge press bldg, potable water treatment plant	500 lbs (avg) Vanfloc, 30 gallons Flocon 100	No	No	No
Flocculant	MagnaFloc 10 and/or Percol E-10 - Mill process reagent	Bags	Pass through item only	n/a	No	No	No
Methyl isobutyl carbinol	Mill process reagent	Totes	Pass through item only	n/a	No	No	No
Potassium ethyl xanthate	Mill process reagent	Boxes	Laydown yard	na	No	No	No
Sodium bisulphite	inhibits bacterial growth on desal membranes	Drums	Potable water treatment plant	55 gallons (avg)	No	No	No
Sodium cyanide	Mill process reagent	Bags	Pass through item only	n/a	No	No	No
Sodium isobutyl xanthate	Mill process reagent	Boxes	pass through item only	n/a	No	No	No
Sodium hydroxide	Ion exchange plant resin column treatment chemical, following sulfuric acid solution rinse	Totes	IX Plant during rinsate procedure	8 t (avg)	No	No	No
Sodium metabisulfite	Mill process reagent	Bags	Laydown yard	n/a	No	No	No
Sodium sulfide	Mill water treatment plant chemical	Bags	Laydown yard, water treatment plant	n/a	No	No	No
Zinc sulfate	Mill process reagent	Bags	Laydown yard, reagent bldg	n/a	No	No	No
Miscellaneous Materials							

Table A.1: Red Dog Port Site Inventory of Significant Materials

Material	Description	How Stored	Primary Location	Quantity in Storage	Exposed to Storm Water?		
					Storage	Handling	Transport
Contaminated soil	Hydrocarbon-contaminated soil excavated during spill response.	Covered trailer for transport	Transported to mine in covered trailer	63 cubic yards	No	Yes	Possible
Paints		Cans	Laydown yard, warehouse	< 2,000 lbs (avg)	No	No	No
Calcium chloride	Road dust suppressant	Bags	Laydown yard	1,133 t (avg)	No	Yes (applied to roads)	Possible
Biosolids	Treated biosolids from domestic sewage from PAC and other support buildings	N/A (incinerated)	N/A	Minimal: collected from filter press, transported in biohazard bags to incinerator	No	No	No
Incinerator ash	Ash from co-incineration of wood and paper, putrescible wastes, and biosolids	N/A (landfilled)	N/A	Minimal: removed from incinerator to trash bins until disposal at landfill	No	Yes	No
Hazardous waste	Hazardous waste	Barrels	Temporary satellite accumulation areas and CSB-2 wash bay, connex in front of #3029	< 5 bbls (max)	No	No	No

Notes:

(1) "Significant material" is defined in 40CFR122.26(b)(12).

(2) Bags, drums, cans, and other containers are stored at laydown inside connexes.

(3) This inventory partially based on 2001 EPCRA 311/312 inventory.

(4) Average figures were compiled for 2023 calendar year where available.

(5) Items destined for consumption in mill processing are transported to the mine site on as-needed basis.

(6) Port maintains conditionally exempt small quantity generator status under RCRA (40CFR262).

Table B.1: Inventory of Potential Pollutants and Sources of Pollution.

Area	Drainage	Facility	Potential Sources of Pollution	Potential Pollutants		A	B	C = 0.5(A+B)	D	E = 0.2(CxD)	F	G = 0.2(ExF)	Y: G≥1
				Normal Conditions	Abnormal Conditions	Toxicity	Quantity	Hazard	Contact water?	Cons.	Frequency	Risk of polluting water	Potential water pollutant?
CSB Area	To CSB mine drainage treatment system with active and passive intervention	CSBs & TUB	Fugitive dust generation from concentrate-handling activities	Suspended solids, metals (Pb, Zn, Cd)		3	5	4.0	4	3.2	5	3.2	Y
			Concentrate spilled or tracked out on equipment tires	Suspended solids, metals (Pb, Zn, Cd)		3	3	3.0	5	3.0	5	3.0	Y
		CSB-2 laydown & racetrack	Erosion and sedimentation		Suspended solids, metals (Pb, Zn, Cd)	3	2	2.5	5	2.5	3	1.5	Y
			Spills of fuel, glycol, motor oil, hydraulic fluid resulting from equipment malfunction and/or operator error		Hydrocarbons	4	3	3.5	4	2.8	3	1.7	Y
			Petroleum-contaminated soil stockpile pit not properly covered and allowed to collect rainfall and overflow		Hydrocarbons	4	3	3.5	5	3.5	2	1.4	Y
		Maintenance shops / wash bays	Spills of fuel, glycol, motor oil, hydraulic fluid, solvents, & cleaners		Hydrocarbons	4	3	3.5	2	1.4	4	1.1	Y
CSB Mine Drainage Treatment System	Treated effluent discharged to outfall 005	Ditches / retention basins	Large precipitation event combined with failure of pump-back or head gate causes bypass of drainage treatment system and/or overflow to tundra		Suspended solids, metals (Pb, Zn, Cd)	3	5	4.0	5	4.0	3	2.4	Y
		Ion exchange plant	Spill of ion exchange resin treatment chemicals (sodium hydroxide)		Sodium hydroxide	2	3	2.5	4	2.0	2	0.8	N
			Spill of ion exchange resin treatment chemicals (sulfuric acid solution)		Acidity, metals (Pb, Zn, Cd)	5	3	4.0	4	3.2	2	1.3	Y
Port Site West	To wet and mesic tundra environs which ultimately drain to the near-shore lagoons	Surge bin, main conveyor, & barge conveyor	Spills of fuel, glycol, motor oil, hydraulic fluid resulting from equipment malfunction and/or operator error		Hydrocarbons	4	3	3.5	4	2.8	3	1.7	Y
			Fugitive dust generation from concentrate-handling activities		Suspended solids, metals (Pb, Zn, Cd)	3	5	4.0	4	3.2	5	3.2	Y
			Erosion and sedimentation	Suspended solids		3	2	2.5	5	2.5	3	1.5	Y
		Bulk fuel secondary containment	Contaminated rainwater or snow from pumping / snow removal		Hydrocarbons	4	3	3.5	3	2.1	3	1.3	Y
		Bulk fuel storage & fuel island	Fuel spills resulting from valve failure, tank overfilling, tank leakage, or pump leakage		Hydrocarbons	4	5	4.5	4	3.6	3	2.2	Y
		Laydown yard	Spills of chemical reagents or hazardous waste in bulk storage area		See Table A.1	5	5	5.0	4	4.0	3	2.4	Y
		Powerhouse complex	Spills of fuel, glycol, motor oil, hydraulic fluid, solvents, & cleaners resulting from equipment malfunction and/or operator error		Hydrocarbons, etc.	4	3	3.5	2	1.4	4	1.1	Y
			Spills of drinking water treatment or sewage treatment chemicals		Ferric chloride, calcium hypochlorite, lime	4	3	3.5	2	1.4	3	0.8	N
			Spills of untreated domestic wastewater or biosolids		Solids, BOD, bacteria, odor	2	3	2.5	3	1.5	3	0.9	N
		PAC	Spills of untreated domestic sewage		Solids, BOD, bacteria, odor	1	3	2.0	3	1.2	3	0.7	N
		Incinerators	Handling of incinerator ash		Suspended solids, ash	1	2	1.5	3	0.9	5	0.9	N
		Dock & loading cells	Spills of fuel, hydraulic oil, motor oil, glycol from vessels		Hydrocarbons, etc.	4	4	4.0	1	0.8	3	0.5	N
			Fugitive dust generation from concentrate-handling activities		Suspended solids, metals (Pb, Zn, Cd)	3	5	4.0	4	3.2	5	3.2	Y

Table B.1: Inventory of Potential Pollutants and Sources of Pollution.

Area	Drainage	Facility	Potential Sources of Pollution	Potential Pollutants		A	B	C = 0.5(A+B)	D	E = 0.2(CxD)	F	G = 0.2(ExF)	Y: G≥1
				Normal Conditions	Abnormal Conditions	Toxicity	Quantity	Hazard	Contact water?	Cons.	Frequency	Risk of polluting water	Potential water pollutant?
MS-2 Material Site	Area is basin; does not drain	Borrow area	Erosion and sedimentation		Suspended solids	1	2	1.5	5	1.5	2	0.6	N
			Spills of fuel, glycol, motor oil, and hydraulic fluid from equipment failure or operator error		Hydrocarbons	4	3	3.5	3	2.1	3	1.3	Y
			Dust from crushing and loading operations	Suspended solids		1	3	2.0	4	1.6	5	1.6	Y
			Explosives residues from blasting and emulsion spills	Ammonia, nitrate	Ammonia, nitrate	3	3	3.0	3	1.8	2	0.7	N
		Sanitary landfill	Spills of fuel, glycol, motor oil, and hydraulic fluid from equipment failure or operator error		Hydrocarbons	4	3	3.5	3	2.1	3	1.3	Y
			Dust from landfill operations	Suspended solids		1	3	2.0	5	2.0	5	2.0	Y
			Trash & incinerator ash	Leachate, suspended solids		3	2	2.5	5	2.5	5	2.5	Y
Material Sites northeast of milepost 4	Drains to mesic tundra environs, which ultimately drain to anadromous fish streams flowing to the Chukchi Sea	Borrow Area	Erosion and sedimentation		Suspended solids	1	2	1.5	5	1.5	2	0.6	N
			Spills of fuel, glycol, motor oil, and hydraulic fluid from equipment failure or operator error		Hydrocarbons	4	3	3.5	3	2.1	3	1.3	Y
			Dust from crushing and loading operations	Suspended solids		1	3	2.0	4	1.6	5	1.6	Y
			Explosives residues from blasting and emulsion spills	Ammonia, nitrate	Ammonia, nitrate	3	3	3.0	3	1.8	2	0.7	N
Haul road	Drains to mesic tundra environs, which ultimately drain to anadromous fish streams flowing to the Chukchi Sea	Haul road	Fugitive dust from con haul trucks	Suspended solids, metals (Pb, Zn, Cd)		3	4	3.5	5	3.5	5	3.5	Y
			Spills of concentrate from con haul truck incidents		Suspended solids, metals (Pb, Zn, Cd)	3	4	3.5	4	2.8	4	2.2	Y
			Fugitive dust from maintenance equipment & other vehicles	Suspended solids		1	2	1.5	5	1.5	5	1.5	Y
			Spills of fuel, glycol, motor oil, and hydraulic fluid from equipment failure or operator error		Hydrocarbons	4	2	3.0	3	1.8	4	1.4	Y

Date	#	Location	Substance	Quantit	Unit
3/8/2011	7274	Port Road Mile 23 to Mile 48	Hydraulic Oil	2.5	U.S. Gallons (gal)
3/15/2011	7286	CKNM, Mile 3.4 to Mile 23	Diesel Fuel	150	U.S. Gallons (gal)
3/22/2011	7299	Port Road Mile 23 to Mile 48	Hydraulic Oil	5	U.S. Gallons (gal)
3/23/2011	7301	CKNM, Mile 3.4 to Mile 23	Ethylene Glycol and Water	2	U.S. Gallons (gal)
4/7/2011	7322	CKNM, Mile 3.4 to Mile 23	Ethylene Glycol and Water	2	U.S. Gallons (gal)
4/8/2011	7323	CKNM, Mile 3.4 to Mile 23	Ethylene Glycol and Water	2	U.S. Gallons (gal)
4/25/2011	7341	Port Millwright Shop	Hydraulic Oil	2	U.S. Gallons (gal)
6/6/2011	7403	CKNM, Mile 3.4 to Mile 23	Ethylene Glycol and Water	3	U.S. Gallons (gal)
7/24/2011	7489	Material Sites #7 to #13	Hydraulic Oil	4	U.S. Gallons (gal)
8/22/2011	7529	CKNM, Mile 3.4 to Mile 23	Ethylene Glycol and Water	6	U.S. Gallons (gal)
9/13/2011	7561	Race Track	Ethylene Glycol	2	U.S. Gallons (gal)
10/11/2011	7624	Port Road Mile 23 to Mile 48	Diesel Fuel	3	U.S. Gallons (gal)
1/24/2012	7743	Port Laydown	Hydraulic Oil	2	U.S. Gallons (gal)
2/7/2012	7759	Port Laydown	Engine Oil	5	U.S. Gallons (gal)
3/17/2012	7806	P-10	Fresh Water (Port RO)	400	U.S. Gallons (gal)
4/22/2012	7837	Material Sites #7 to #13	Hydraulic Oil	2	U.S. Gallons (gal)
5/20/2012	7874	Port Laydown	Other Liquid (describe)	1	U.S. Gallons (gal)
6/14/2012	7900	IX Outfall Line	Other Liquid (describe)	1000	U.S. Gallons (gal)
6/15/2012	7902	Port Tank Farm	Diesel Fuel	35	U.S. Gallons (gal)
6/17/2012	7901	Port Tank Farm	Diesel Fuel	8	U.S. Gallons (gal)
8/4/2012	7969	P-10	Zinc Concentrate	5	Pounds
8/13/2012	7977	Port Road Mile 23 to Mile 48	Zinc Concentrate	170430	Pounds
8/26/2012	7998	Port Road Mile 23 to Mile 48	Hydraulic Oil	35	U.S. Gallons (gal)
10/14/2012	8068	Dock	Ammonium Nitrate	1000	Pounds
10/16/2012	8072	Port PAC	Diesel Fuel	1.5	U.S. Gallons (gal)
1/15/2013	8165	CKNM, Mile 3.4 to Mile 23	Ethylene Glycol and Water	3	U.S. Gallons (gal)
2/13/2013	8197	Race Track	Other Liquid (describe)	1	U.S. Gallons (gal)
2/13/2013	8197	Race Track	Power Steering Fluid	1	U.S. Gallons (gal)
3/23/2013	8240	Port Fuel Island	Diesel Fuel	3	U.S. Gallons (gal)
3/23/2013	8241	Port Fuel Island	Diesel Fuel	3	U.S. Gallons (gal)
3/24/2013	8242	CKNM, Mile 3.4 to Mile 23	Ethylene Glycol	13	U.S. Gallons (gal)
3/24/2013	8243	Port Fuel Island	Diesel Fuel	2	U.S. Gallons (gal)
4/23/2013	8276	Race Track	Engine Oil	2.5	U.S. Gallons (gal)
6/4/2013	8351	Port Road Mile 23 to Mile 48	Ethylene Glycol	1	U.S. Gallons (gal)
7/1/2013	8399	Port Road Mile 23 to Mile 48	Hydraulic Oil	25	U.S. Gallons (gal)
7/2/2013	8403	Dock	Hydraulic Oil	25	U.S. Gallons (gal)
8/1/2013	8446	Material Site #2 and Port Lan	Ethylene Glycol and Water	2	U.S. Gallons (gal)
8/5/2013	8464	Port Road Mile 23 to Mile 48	Ethylene Glycol and Water	5	U.S. Gallons (gal)
8/14/2013	8481	CKNM, Mile 3.4 to Mile 23	Ethylene Glycol and Water	1	U.S. Gallons (gal)
8/22/2013	8491	CKNM, Mile 3.4 to Mile 23	Ethylene Glycol	13	U.S. Gallons (gal)
8/22/2013	8491	CKNM, Mile 3.4 to Mile 23	Ethylene Glycol and Water	13	U.S. Gallons (gal)
10/21/2013	8576	All Other Port Facilities	Diesel Fuel	1	U.S. Gallons (gal)
12/9/2013	8643	Race Track	Ethylene Glycol and Water	2	U.S. Gallons (gal)
1/3/2014	8666	Port Road Mile 23 to Mile 48	Ethylene Glycol and Water	7.5	U.S. Gallons (gal)
1/21/2014	8683	Road From Dock to Mile 3.4	Zinc Concentrate	3000	Pounds
2/4/2014	8697	Port Road Mile 23 to Mile 48	Ethylene Glycol and Water	3	U.S. Gallons (gal)
2/6/2014	8699	Port Road Mile 23 to Mile 48	Ethylene Glycol and Water	3	U.S. Gallons (gal)
2/8/2014	8700	Port Road Mile 23 to Mile 48	Engine Oil	5	U.S. Gallons (gal)
3/2/2014	8727	Race Track	Engine Oil	1.5	U.S. Gallons (gal)
4/5/2014	8765	CKNM, Mile 3.4 to Mile 23	Ethylene Glycol and Water	4.5	U.S. Gallons (gal)
4/24/2014	8793	Port Road Mile 23 to Mile 48	Ethylene Glycol and Water	10	U.S. Gallons (gal)
4/26/2014	8797	Race Track	Ethylene Glycol and Water	2	U.S. Gallons (gal)
4/26/2014	8797	Race Track	Ethylene Glycol and Water	2	U.S. Gallons (gal)
5/5/2014	8806	Race Track	Ethylene Glycol and Water	2	U.S. Gallons (gal)
5/5/2014	8812	Race Track	Ethylene Glycol and Water	1.5	U.S. Gallons (gal)
5/25/2014	8842	Port Road Mile 23 to Mile 48	Hydraulic Oil	2	U.S. Gallons (gal)
5/29/2014	8846	Port Road Mile 23 to Mile 48	Ethylene Glycol and Water	5	U.S. Gallons (gal)
6/7/2014	8864	CKNM, Mile 3.4 to Mile 23	Ethylene Glycol and Water	1.5	U.S. Gallons (gal)
6/7/2014	8865	P-8	Ethylene Glycol	5	U.S. Gallons (gal)
7/30/2014	8919	Port Road Mile 23 to Mile 48	Ethylene Glycol and Water	6	U.S. Gallons (gal)

Date	#	Location	Substance	Quantit	Unit
8/9/2014	8938	CKNM, Mile 3.4 to Mile 23	Ethylene Glycol and Water	3	U.S. Gallons (gal)
8/20/2014	8947	CKNM, Mile 3.4 to Mile 23	Zinc Concentrate	80000	Pounds
8/20/2014	8947	CKNM, Mile 3.4 to Mile 23	Zinc Concentrate	50000	Pounds
9/3/2014	8964	CSB-1	Hydraulic Oil	4	U.S. Gallons (gal)
9/12/2014	8968	CKNM, Mile 3.4 to Mile 23	Diesel Fuel	4	U.S. Gallons (gal)
9/18/2014	8980	Race Track	Ethylene Glycol and Water	3	U.S. Gallons (gal)
1/8/2015	9084	CKNM, Mile 3.4 to Mile 23	Ethylene Glycol and Water	2	U.S. Gallons (gal)
1/25/2015	9099	CKNM, Mile 3.4 to Mile 23	Ethylene Glycol and Water	2	U.S. Gallons (gal)
1/29/2015	9102	Port Road Mile 23 to Mile 48	Engine Oil	5	U.S. Gallons (gal)
6/25/2015	9234	Port Road Mile 23 to Mile 48	Ethylene Glycol and Water	3	U.S. Gallons (gal)
8/9/2015	9308	Material Sites #7 to #13	Hydraulic Oil	5	U.S. Gallons (gal)
9/5/2015	9343	Port Road Mile 23 to Mile 48	Diesel Fuel	60	U.S. Gallons (gal)
9/5/2015	9343	Port Road Mile 23 to Mile 48	Diesel Fuel	5	U.S. Gallons (gal)
10/4/2015	9386	Port Road Mile 23 to Mile 48	Zinc Concentrate	145000	Pounds
12/1/2015	9460	CKNM, Mile 3.4 to Mile 23	Engine Oil	1.5	U.S. Gallons (gal)
1/31/2016	9525	CKNM, Mile 3.4 to Mile 23	Engine Oil	1	U.S. Gallons (gal)
1/31/2016	9526	CKNM, Mile 3.4 to Mile 23	Diesel Fuel	3	U.S. Gallons (gal)
3/9/2016	9576	TUB	Hydraulic Oil	1	U.S. Gallons (gal)
3/30/2016	9600	Port Road Mile 23 to Mile 48	Ethylene Glycol and Water	5	U.S. Gallons (gal)
3/30/2016	9600	Port Road Mile 23 to Mile 48	Ethylene Glycol and Water	5	U.S. Gallons (gal)
4/4/2016	9612	Material Sites #3 to #6	Hydraulic Oil	4	U.S. Gallons (gal)
4/5/2016	9613	Port Road Mile 23 to Mile 48	Hydraulic Oil	2	U.S. Gallons (gal)
4/7/2016	9611	Material Sites #3 to #6	Ethylene Glycol and Water	2	U.S. Gallons (gal)
4/12/2016	9622	CKNM, Mile 3.4 to Mile 23	Ethylene Glycol and Water	2	U.S. Gallons (gal)
5/14/2016	9653	TUB	Hydraulic Oil	8	U.S. Gallons (gal)
5/23/2016	9664	Dock	Hydraulic Oil	10	U.S. Gallons (gal)
5/23/2016	9664	Dock	Hydraulic Oil	25	U.S. Gallons (gal)
6/8/2016	9690	Port Road Mile 23 to Mile 48	Hydraulic Oil	15	U.S. Gallons (gal)
6/28/2016	9714	Material Sites #7 to #13	Ethylene Glycol and Water	1	U.S. Gallons (gal)
7/16/2016	9743	Material Sites #7 to #13	Hydraulic Oil	4	U.S. Gallons (gal)
7/19/2016	9753	Port Road Mile 23 to Mile 48	Diesel Fuel	1	U.S. Gallons (gal)
8/7/2016	9786	Port Road Mile 23 to Mile 48	Ethylene Glycol and Water	2	U.S. Gallons (gal)
8/8/2016	9790	CKNM, Mile 3.4 to Mile 23	Ethylene Glycol and Water	2	U.S. Gallons (gal)
8/28/2016	9817	Port Road Mile 23 to Mile 48	Ethylene Glycol	1.5	U.S. Gallons (gal)
9/4/2016	9822	CKNM, Mile 3.4 to Mile 23	Ethylene Glycol and Water	1.5	U.S. Gallons (gal)
10/8/2016	9877	Dock	Ammonium Nitrate	1000	Pounds
10/8/2016	9877	Dock	Ammonium Nitrate	100	Pounds
10/8/2016	9877	Dock	Ammonium Nitrate	1000	Pounds
11/2/2016	9907	All Other Port Facilities	Hydraulic Oil	10	U.S. Gallons (gal)
11/8/2016	9914	Port Laydown	Ammonium Nitrate	15	Pounds
1/1/2017	9980	Port Road Mile 23 to Mile 48	Diesel Fuel	1	U.S. Gallons (gal)
1/1/2017	9980	Port Road Mile 23 to Mile 48	Diesel Fuel	1.5	U.S. Gallons (gal)
1/1/2017	9980	Port Road Mile 23 to Mile 48	Zinc Concentrate	143260	Pounds
1/1/2017	9980	Port Road Mile 23 to Mile 48	Zinc Concentrate	143.26	Pounds
3/9/2017	10061	CKNM, Mile 3.4 to Mile 23	Ethylene Glycol and Water	2	U.S. Gallons (gal)
4/24/2017	10110	Port Road Mile 23 to Mile 48	Ethylene Glycol and Water	5	U.S. Gallons (gal)
6/13/2017	10183	Port Road Mile 23 to Mile 48	Ethylene Glycol and Water	2	U.S. Gallons (gal)
6/29/2017	10213	Port Road Mile 23 to Mile 48	Ethylene Glycol and Water	5	U.S. Gallons (gal)
7/8/2017	10222	CKNM, Mile 3.4 to Mile 23	Hydraulic Oil	20	U.S. Gallons (gal)
7/8/2017	10222	CKNM, Mile 3.4 to Mile 23	Hydraulic Oil	19.5	U.S. Gallons (gal)
7/30/2017	10271	CKNM, Mile 3.4 to Mile 23	Engine Oil	3	U.S. Gallons (gal)
9/1/2017	10335	Port Road Mile 23 to Mile 48	Ethylene Glycol and Water	4	U.S. Gallons (gal)
10/4/2017	10379	Port Road Mile 23 to Mile 48	Ethylene Glycol and Water	2	U.S. Gallons (gal)
10/15/2017	10399	Race Track	Ethylene Glycol and Water	13	U.S. Gallons (gal)
11/20/2017	10450	CKNM, Mile 3.4 to Mile 23	Ethylene Glycol and Water	2	U.S. Gallons (gal)
2/11/2018	10536	Port Road Mile 23 to Mile 48	Ethylene Glycol and Water	1	U.S. Gallons (gal)
3/19/2018	10586	Port Powerhouse	Propylene Glycol	10	U.S. Gallons (gal)
3/20/2018	10590	Port Road Mile 23 to Mile 48	Ethylene Glycol and Water	1.5	U.S. Gallons (gal)
3/21/2018	10592	Port Road Mile 23 to Mile 48	Ethylene Glycol and Water	1.5	U.S. Gallons (gal)
5/23/2018	10690	Port Laydown	Hydraulic Oil	1.5	U.S. Gallons (gal)

Date	#	Location	Substance	Quantit	Unit
6/1/2018	10702	CKNM, Mile 3.4 to Mile 23	Ethylene Glycol and Water	1	U.S. Gallons (gal)
6/6/2018	10707	CKNM, Mile 3.4 to Mile 23	Ethylene Glycol and Water	8	U.S. Gallons (gal)
9/26/2018	10864	Dock	Hydraulic Oil	8	U.S. Gallons (gal)
9/29/2018	10871	CSB-2	Hydraulic Oil	4	U.S. Gallons (gal)
10/22/2018	10909	Port Laydown	Ammonium Nitrate	65	Pounds
10/22/2018	10909	Port Laydown	Ammonium Nitrate	3	Pounds
10/25/2018	10917	Port Tank Farm	Diesel Fuel	2	U.S. Gallons (gal)
11/22/2018	10957	CKNM, Mile 3.4 to Mile 23	Ethylene Glycol and Water	1.5	U.S. Gallons (gal)
2/19/2019	11052	Port Road Mile 23 to Mile 48	Diesel Fuel	3	U.S. Gallons (gal)
2/19/2019	11052	Port Road Mile 23 to Mile 48	Diesel Fuel	15	U.S. Gallons (gal)
2/27/2019	11069	Port Road Mile 23 to Mile 48	Ethylene Glycol and Water	1	U.S. Gallons (gal)
4/24/2019	11159	Port Road Mile 23 to Mile 48	Hydraulic Oil	20	U.S. Gallons (gal)
5/22/2019	11220	Race Track	Hydraulic Oil	10	U.S. Gallons (gal)
6/21/2019	11282	Port Road Mile 23 to Mile 48	Zinc Concentrate	5300	Pounds
7/16/2019	11334	Port Laydown	Hydraulic Oil	5	U.S. Gallons (gal)
9/30/2019	11459	Port PAC	Other Liquid (describe)	60	U.S. Gallons (gal)
11/15/2019	11532	Dawg Shed	Diesel and Engine Oil	1	U.S. Gallons (gal)
11/16/2019	11535	Port HE Shop	Hydraulic Oil	4	U.S. Gallons (gal)
4/19/2020	11749	Race Track	Hydraulic Oil	1.5	U.S. Gallons (gal)
6/2/2020	11802	Race Track	Ethylene Glycol and Water	2	U.S. Gallons (gal)
6/2/2020	11801	CKNM, Mile 3.4 to Mile 23	Engine Oil	2	U.S. Gallons (gal)
6/5/2020	11810	Port Laydown	Other Liquid (describe)	2	U.S. Gallons (gal)
8/29/2020	11929	Port Laydown	Zinc Concentrate	10	Pounds
8/29/2020	11929	Port Laydown	Zinc Concentrate	30	Pounds
9/30/2020	11962	Port Road Mile 23 to Mile 48	Zinc Concentrate	50000	Pounds
10/22/2020	11982	Port Road Mile 23 to Mile 48	Ethylene Glycol and Water	4	U.S. Gallons (gal)
12/4/2020	12023	Race Track	Hydraulic Oil	30	U.S. Gallons (gal)
12/17/2020	12035	Port Tank Farm	Diesel Fuel	3	U.S. Gallons (gal)
12/17/2020	12035	Port Tank Farm	Diesel Fuel	5	U.S. Gallons (gal)
12/30/2020	12037	CKNM, Mile 3.4 to Mile 23	Zinc Concentrate	6000	Pounds
1/7/2021	12046	Port Road Mile 23 to Mile 48	Engine Oil	2	U.S. Gallons (gal)
1/10/2021	12051	CKNM, Mile 3.4 to Mile 23	Diesel and Engine Oil	5	U.S. Gallons (gal)
1/21/2021	12063	Port Road Mile 23 to Mile 48	Transmission Oil	1	U.S. Gallons (gal)
2/10/2021	12079	Port Road Mile 23 to Mile 48	Ethylene Glycol and Water	7	U.S. Gallons (gal)
3/20/2021	12111	Race Track	Hydraulic Oil	5	U.S. Gallons (gal)
3/30/2021	12127	Dawg Shed	Hydraulic Oil	1	U.S. Gallons (gal)
6/28/2021	12235	Port Road Mile 23 to Mile 48	Diesel and Engine Oil	6	U.S. Gallons (gal)
8/18/2021	12321	CKNM, Mile 3.4 to Mile 23	Diesel and Hydraulic Oil	2	U.S. Gallons (gal)
9/2/2021	12343	Port Road Mile 23 to Mile 48	Ethylene Glycol and Water	1	U.S. Gallons (gal)
9/10/2021	12355	P-10	Diesel Fuel	5	U.S. Gallons (gal)
4/19/2022	12639	Race Track	Hydraulic Oil	5	U.S. Gallons (gal)
5/29/2022	12717	Port Powerhouse	Diesel Fuel	10	U.S. Gallons (gal)
6/13/2022	12739	Race Track	Hydraulic Oil	1.5	U.S. Gallons (gal)
7/10/2022	12777	CSB-1	Sewage, Raw	75	U.S. Gallons (gal)
7/13/2022	12782	Port Road Mile 23 to Mile 48	Ethylene Glycol and Water	3	U.S. Gallons (gal)
7/18/2022	12794	CKNM, Mile 3.4 to Mile 23	Ethylene Glycol and Water	1	U.S. Gallons (gal)
7/30/2022	12814	Port Laydown	Diesel Fuel	2	U.S. Gallons (gal)
8/10/2022	12834	Port STP	Sewage, Raw	3000	U.S. Gallons (gal)
8/27/2022	12859	Port Road Mile 23 to Mile 48	Ethylene Glycol and Water	8	U.S. Gallons (gal)
8/28/2022	12862	Port Road Mile 23 to Mile 48	Ethylene Glycol and Water	2	U.S. Gallons (gal)
9/1/2022	12870	Material Sites #7 to #13	Ethylene Glycol and Water	2	U.S. Gallons (gal)
9/14/2022	12887	CKNM, Mile 3.4 to Mile 23	Hydraulic Oil	1	U.S. Gallons (gal)
10/5/2022	12912	CSB-1	Diesel Fuel	1	U.S. Gallons (gal)
10/19/2022	12928	CSB-1	Hydraulic Oil	5	U.S. Gallons (gal)
1/2/2023	13006	Port Road Mile 23 to Mile 48	Propylene Glycol	3	U.S. Gallons (gal)
1/15/2023	13019	CKNM, Mile 3.4 to Mile 23	Hydraulic Oil	1	U.S. Gallons (gal)
1/23/2023	13028	Port Road Mile 23 to Mile 48	Engine Oil	2	U.S. Gallons (gal)
2/8/2023	13045	Race Track	Diesel Fuel	3	U.S. Gallons (gal)
3/1/2023	13062	Port Road Mile 23 to Mile 48	Hydraulic Oil	2	U.S. Gallons (gal)
5/21/2023	13160	CSB-1	Hydraulic Oil	4	U.S. Gallons (gal)

Date	#	Location	Substance	Quantit	Unit
6/24/2023	13222	CSB-1	Hydraulic Oil	1	U.S. Gallons (gal)
7/10/2023	13253	Race Track	Ethylene Glycol and Water	7.5	U.S. Gallons (gal)
7/26/2023	13288	Material Site #2 and Port Lan	Ethylene Glycol and Water	4	U.S. Gallons (gal)
8/3/2023	13299	Port Tank Farm	Diesel Fuel	5	U.S. Gallons (gal)
10/18/2023	13399	CKNM, Mile 3.4 to Mile 23	Zinc Concentrate	750	Pounds
10/18/2023	13399	CKNM, Mile 3.4 to Mile 23	Zinc Concentrate	1200	Pounds
11/4/2023	13427	Material Sites #3 to #6	Diesel Fuel	1	U.S. Gallons (gal)
12/24/2023	13488	Port Road Mile 23 to Mile 48	Ethylene Glycol and Water	3	U.S. Gallons (gal)

Red Dog Port BMP Plan May 2024

Final Audit Report 2024-05-31

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