# GENERAL PLAN OF OPERATIONS

# APPENDIX 7a

## INTEGRATED WASTE MANAGEMENT DISPOSAL PLAN

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# Executive Summary

The Greens Creek Mine is owned and operated by Hecla Greens Creek Mining Company (HGCMC) a wholly owned subsidiary of Hecla Mining Company, Inc. The mine is an underground metals mine near Hawk Inlet on the northern end of Admiralty Island. It is located approximately 18 miles southwest of Juneau, Alaska. The mine is situated in the Greens Creek watershed in the Tongass National Forest. HGCMC has prepared this Integrated Waste Management and Disposal Plan to comply with the requirements of 18 AAC 60 Solid Waste Management Regulations of the Alaska Department of Environmental Conservation (ADEC) and the US Forest Service (USFS) General Plan of Operations (GPO) for the Greens Creek Mine.

This Integrated Waste Management and Disposal Plan (Plan) describes the required procedures for deposition of mill tailings, waste rock, and managing solid wastes and hazardous materials generated at the Greens Creek facilities. Specific management methods for the tailings placement and waste rock disposal within the mine as backfill and surface disposal are also included in this Plan, as are procedures for reusing and recycling materials. Methods for reusing and recycling materials are promoted and implemented whenever possible.

Decisions that may affect the generation of solid wastes are made with consideration to the following order of priorities: 1) potential to degrade waters of the State; 2) waste source reduction; 3) recycling of materials; 4) waste treatment; and 5) waste disposal. Appropriate management begins with geochemical characterization of excavated/mined material and at the procurement stage, before materials are purchased. Safety Data Sheets (SDS) of any new material proposed to be used at the Greens Creek Mine are reviewed prior to purchasing. The goal is to avoid materials that are considered hazardous or are classified as hazardous waste once the materials can no longer be used for their intended purposes, both for the protection of the workers handling these materials and for the benefit of the environment.

Methods to minimize the production of waste include proper handling and storage of hazardous materials to prevent accidental releases and cross-contamination of materials and providing appropriate secondary containment for hazardous materials to prevent releases, plus the associated generation of waste materials and spill residues, and the reuse and/or recycling of materials whenever possible.

Wastes are characterized to determine their appropriate management method. Non-liquid, non-hazardous wastes that cannot be recycled are disposed of at onsite disposal areas within the underground mine workings or the dry stack tailings disposal facility (TDF). Liquids, hazardous wastes and other materials that cannot be managed onsite are shipped offsite for recycling or disposal. This includes solvents, lamps, batteries, liquid paints, hydrocarbons, and mercury.

Solid waste disposal sites are constructed in underground workings of the mine (worked out stopes) for the disposal of mill tailings (as a cement/tailings mix backfill), waste rock and inert solid waste such as:

- Shipping containers, super sacks, general debris;

- Non-recyclable scrap metal;
- Tires;
- Settled solids from sumps, ditches and degritting basins;
- Construction items that include:
    - Scrap metal
    - Broken concrete slabs
    - Pipe
    - Other similar nonhazardous wastes
- Empty 5-gallon buckets and 55-gallon drums that cannot be recycled as scrap metal.

Ash from the incineration of camp wastes, sewage sludge, and sludge from the water treatment plant at the TDF are disposed of within the tailings dry stack.

Potentially reactive waste rock from the mine are kept underground, disposed of at the designated surface waste rock dump (Site 23), or hauled to the TDF for use on the internal roads or co-disposed with tailings.

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# Acronyms

| | |
|---|---|
| AAC | Alaska Administrative Code |
| ABA | Acid Based Accounting |
| ADEC | Alaska Department of Environmental Conservation |
| ADFG | Alaska Department of Fish & Game |
| ADNR | Alaska Department of Natural Resources |
| ANFO | Ammonium nitrate and fuel oil |
| APDES | Alaska Pollution Discharge Elimination System |
| ARD | Acid Rock Drainage |
| AS | Alaska Statute |
| CERCLA | Comprehensive Environmental Responsibility, Compensation & Liability Act |
| CESQG | Conditionally Exempt Small Quantity Generator |
| CFR | Code of Federal Regulations |
| CFATS | Chemical Facility Anti-Terrorism Standards |
| CWA | Clean Water Act |
| DHS | Department of Homeland Security |
| DRS | Development Rock Stockpile |
| EPA | Environmental Protection Agency |
| EPCRA | Emergency Planning and Community Right to Know Act |
| FWS | Fish & Wildlife Service |
| GP | Graphitic Phyllite |
| GPO | General Plan of Operation |
| HazCom | Hazardous Communication |
| HDPE | High Density Polyethylene |
| IAEA | International Atomic Energy Agency |
| IATA | International Air Transport Association |
| ICAO | International Civil Aviation Organization |
| IMDG | International Maritime Dangerous Goods |
| IUR | Inventory Update Reporting |
| LEPC | Local Emergency Planning Committee |
| LDR | Land Disposal Restriction |
| LQG | Large Quantity Generator |
| SDS | Safety Data Sheet |
| MSHA | US Department of Labor Mine Safety and Health Administration |
| MWMP | Meteoric Water Mobility Procedure |
| NiCad | Nickel Cadmium |
| NiMH | Nickel Metal Hydride |
| NNP | Net Neutralization Potential |
| NPDES | National Pollutant Discharge Elimination System |

| | |
|---|---|
| NRC | National Response Center |
| OSHA | US Department of Labor Occupational Safety & Health Administration |
| Plan | Integrated Waste Management and Disposal Plan |
| PPE | Personal Protective Equipment |
| RCRA | Resource Conservation and Recovery Act |
| SERC | State Emergency Response Commission |
| SQG | Small Quantity Generator |
| TDG | Transportation of Dangerous Goods |
| TRI | Toxic Release Inventory |
| TSCA | Toxic Substances Control Act |
| TDF | Tailings Disposal Facility |
| USCG | US Coast Guard |
| USDOT | US Department of Transportation |
| USFS | US Forest Service |
| USGS | US Geological Survey |
| VOC | Volatile Organic Compounds |
| WTP | Water Treatment Plant |

# 1.0 Introduction

This Integrated Waste Management and Disposal Plan (Plan) describes the required procedures for managing solid wastes and hazardous materials[1] generated at the Greens Creek Mine facilities, the temporary storage and final disposal of waste rock excavated during mining operations and deposition of mill tailings. Also included in this Plan are procedures for reusing and recycling materials, which are promoted and implemented wherever possible.

Hecla Greens Creek Mining Company (HGCMC) has prepared this Integrated Waste Management and Disposal Plan to comply with the requirements of 18 AAC 60 Solid Waste Management Regulations of the Alaska Department of Environmental Conservation (ADEC) and the US Forest Service (USFS) General Plan of Operations (GPO) for the Greens Creek Mine.

## 1.1 Project Location and Summary

The Greens Creek Mine is owned and operated by Hecla Greens Creek Mining Company (HGCMC) a wholly owned subsidiary of Hecla Mining Company, Inc. The Greens Creek Mine is located near Hawk Inlet on northern Admiralty Island, in the Tongass National Forest, approximately 18 miles southwest of Juneau, Alaska (Figure 1). The Mine site is situated partly within the Admiralty Island National Monument and completely within the municipal boundaries of the City and Borough of Juneau and is comprised of federal and patented mining claims. The Greens Creek mine facilities are located within the Greens Creek, Zinc Creek, Tributary Creek, and Cannery Creek watersheds.

The USFS has issued special use permits/leases for various aspects of the operations within the National Monument. In addition, HGCMC holds a number of patented mining and unpatented mining claims in the area, and 17 acres in Hawk Inlet under a warranty deed with Bristol Resources, Inc. The patented mining claims will be conveyed to the United States at the end of mine life or in 2095 at the latest.

The Greens Creek Mine has been in operation since 1989, with one temporary cessation of operations due to low metal prices from April 1993 until July 1996 and has been stable and constantly improving since recommissioning. HGCMC produces three concentrates containing four payable metals (silver, zinc, lead, and gold) for shipping to smelters around the world.

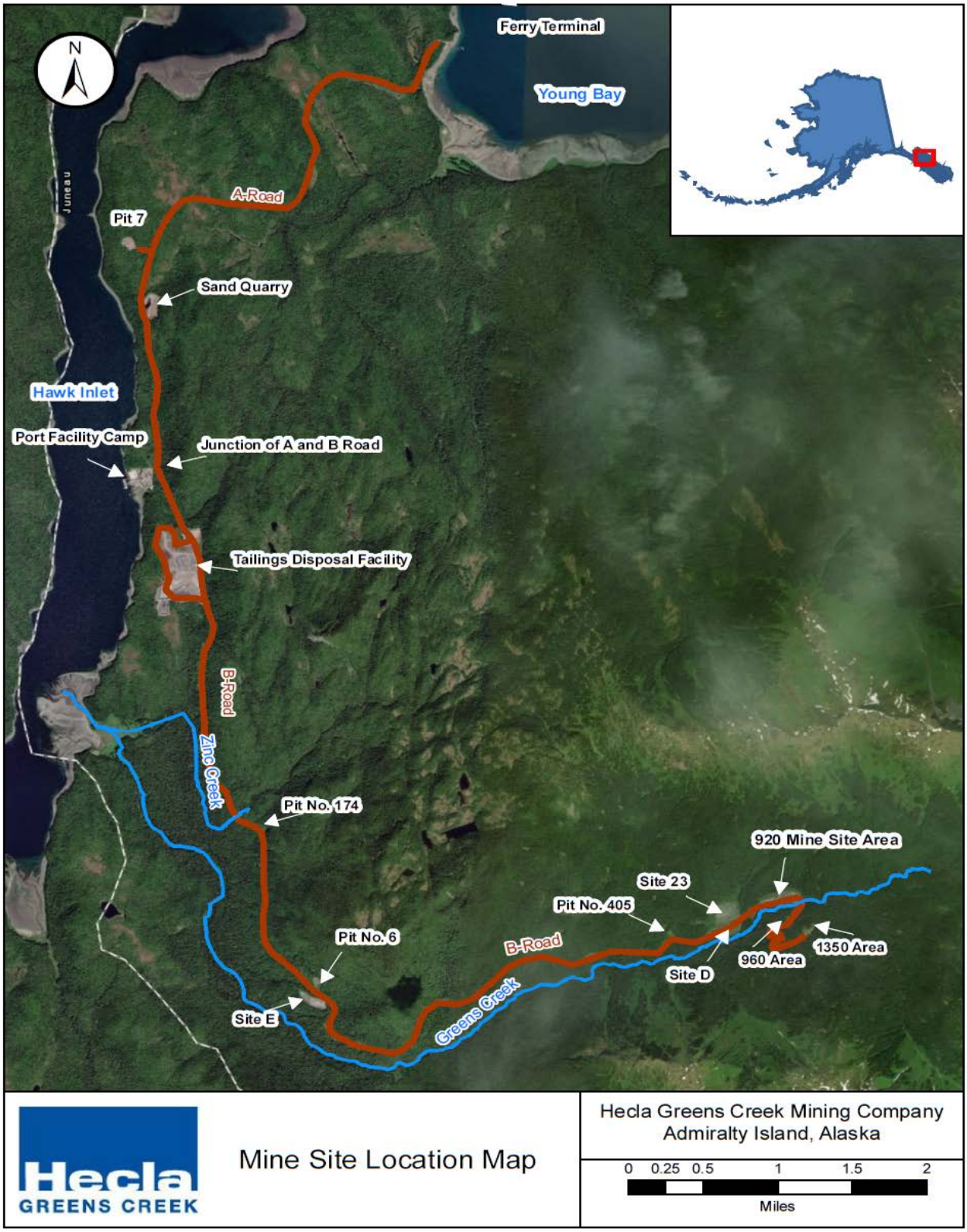
The mine processes approximately 2,300 tons of ore per day and employs over 400 full time employees to operate the mine and processing facilities.

[1] As per 49 CFR Section § 105.5, *Hazardous material* means a substance or material that the Secretary of Transportation has determined is capable of posing an unreasonable risk to health, safety, and property when transported in commerce, and has designated as hazardous under section 5103 of Federal hazardous materials transportation law (49 U.S.C. 5103). The term includes hazardous substances, hazardous wastes, marine pollutants, elevated temperature materials, materials designated as hazardous in the Hazardous Materials Table (see 49 CFR § 172.101), and materials that meet the defining criteria for hazard classes and divisions in 49 CFR part 173 subchapter C

The Greens Creek ore deposit consists of the following:

- Greens Creek is a Triassic age volcanogenic massive sulfide (VMS) deposit. The US Geological Survey (USGS) classifies the deposit as "Kuroko"-type, but mine personnel prefer "hybrid" because some of the features of the Kuroko-type model are not represented.
- The deposit occurs at the contact between black graphitic meta-argillite (structural footwall, geological hanging wall) and thinly laminated quartz-mica-carbonate phyllite (structural hanging wall, geological footwall).
- Both argillite and phyllite are mineralized with pyrite to varying degrees, but the phyllite is more mineralized.
- There are three main ore types present: massive, black and white. Massive ore is most common and is composed of pyrite, sphalerite and galena in a matrix of barite-bearing silica-carbonate rock. Chalcopyrite and arsenic, antimony and silver sulfosalts are present but less common. The black ore is similar but contains graphite. The white ore is pyrite poor and the gangue mineralogy is variable (barite, silicates or carbonates).

**Figure 1: Project Location**



# 2.0 Waste Management

The following sections provide an overview of the regulatory requirements applicable to the management of solid wastes and the management procedures that are employed by the Greens Creek Mine to ensure wastes are handled safely and in accordance with all applicable regulations. The locations of the mine footprint and onsite facilities are shown on Figure 2. Key waste management facilities include the active waste rock dump (Site 23), the inactive waste rock sites (C, D, E and the 1350), the Tailings Disposal Facility (TDF), Hawk Inlet Port facilities, sewage treatment facilities, and water treatment plant are shown on Figure 2, 3, 4, and 5.

Management of wastes at the Greens Creek Mine begins before the materials are purchased by evaluating the potential environmental impacts of materials being considered for the project. In general, the Greens Creek Mine minimizes the overall generation of waste to the extent practical and minimizes the use of materials that are regulated as hazardous wastes when they no longer serve their intended purpose. Materials are reused and recycled whenever possible. Permitted solid waste disposal sites within the underground workings and at the designated areas within the TDF for the disposal of inert solid wastes are operated in accordance with the Integrated Waste Management Permit 0211-BA001 administered by the Alaska Department of Environmental Conservation (ADEC) and the regulations contained in 18 AAC 60. Contact water from waste management facilities are managed to ensure compliance with State of Alaska water quality standards.

Materials that cannot be managed onsite, such as liquid wastes, hazardous wastes, certain items to be recycled or reused, and wastes prohibited from disposal onsite, are shipped offsite for reuse, recycle or disposal at appropriate facilities.

The waste management methods discussed in these sections are based on the applicable regulations at the time this Plan was written. Changes to management methods may be required as regulations are modified. Additionally, the waste management permit may contain additional provisions that may necessitate changes to the methods discussed herein.

**Figure 2: Mine Site Location Map**

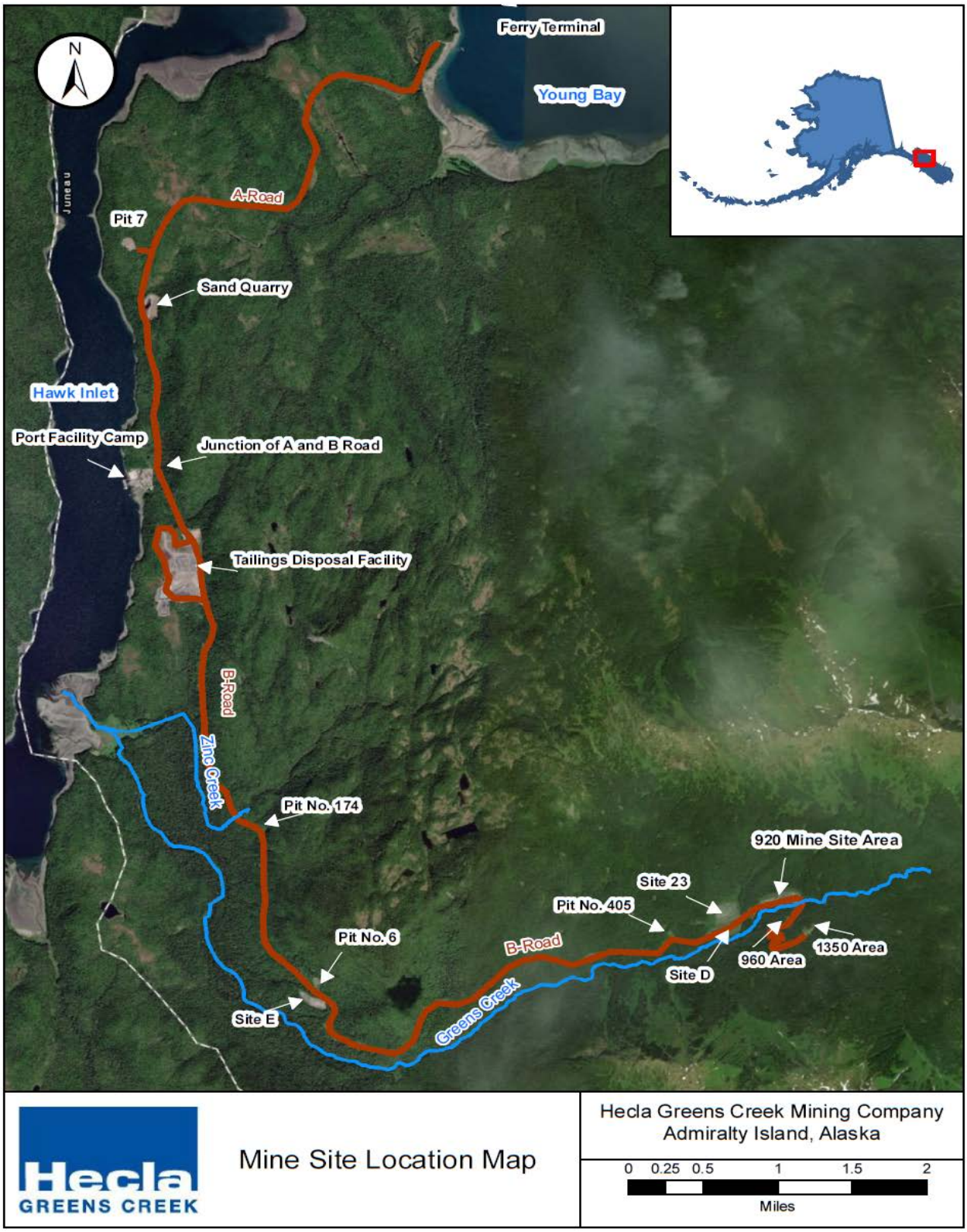


**Figure 3: Hawk Inlet**

**Figure 4: Mill Site and 920 Portal**

**Figure 5: Tailings Disposal Facility**

## 2.1 Regulatory Overview

Solid wastes are regulated in the State of Alaska under two main bodies of regulations:

- The Resource Conservation and Recovery Act (RCRA) federal regulations contained in 40 CFR 260 to 279; and
- The State of Alaska statutes and regulations contained in AS 46.03 and 18 AAC 60, Solid Waste Management respectively.

Hazardous wastes are regulated by the U.S. Environmental Protection Agency (EPA), Region 10 in Alaska, in accordance with the RCRA regulations. Alaska is one of the few states that does not have the authority to administer hazardous waste regulations and therefore defers to the federal regulations. Non-hazardous solid wastes, tailings and waste rock are mainly managed under the state regulations in 18 AAC 60, which includes permitted solid waste landfills and tailings disposal facilities.

When a material can no longer be used for its original purpose or otherwise meets the definition of *solid waste*, as defined in Section 2.1.1, a determination must be made as to whether or not the solid waste is a *hazardous waste*, as defined in Section 2.1.2. Waste determinations are discussed in Section 2.11.1. Once a waste determination has been made, the appropriate management method for the waste can be identified.

### 2.1.1 Definition of Solid Waste

The definition of solid waste can be found in AS 46.03.900(26); "solid waste" means garbage, refuse, abandoned, or other discarded solid or semi-solid material, regardless of whether subject to decomposition, originating from any source. Under the Federal definition, 40 CFR §261.2 a ***solid waste*** is any material, liquid or solid, except for materials excluded from the regulation that are a ***discarded material***, meaning a material that is:

1. *Abandoned:*
    - Disposed of; or
    - Burned or incinerated; or
    - Accumulated, stored, or treated (but not recycled) before or in lieu of being abandoned by being disposed of, burned, or incinerated.
2. *Recycled or accumulated, stored or treated before recycling* if it is:
    - Used in a manner constituting disposal
    - Burned for energy recovery
    - Reclaimed; or
    - Accumulated speculatively.

3. Considered *inherently waste-like*; or
4. A *military munition* identified as a solid waste in 40 CFR §266.202.

There are several exclusions to the definition of solid wastes, as provided in 40 CFR § 261.4(a), such as domestic sewage and point source discharges subject to regulation under Section 402 of the Clean Water Act (CWA).

### 2.1.2 Definition of Hazardous Waste

As defined in 40 CFR § 261.3, a solid waste is ***hazardous*** if:

1. It is not *excluded* from regulation as a hazardous waste under 40 CFR §261.4(b);
2. It is a *characteristic hazardous* waste: it exhibits one of the characteristics of hazardous waste defined in Subpart C of 40 CFR 261:
    - Ignitability;
    - Corrosivity;
    - Reactivity; or
    - Toxicity.
3. It is a *listed hazardous waste*: a waste listed in Subpart D of 40 CFR 261 and has not been excluded in 40 CFR §260.20 or 260.22;
4. It is a *mixture* of solid waste and one or more listed hazardous waste and has not been excluded from regulation as a hazardous waste by an exemption to the regulations;
5. *Rebuttable presumption for used oil*: Used oil containing more than 1000 ppm total halogens is presumed to be a hazardous waste because it has been mixed with halogenated hazardous waste listed in Subpart D of 40 CFR 261. Persons may rebut this presumption by demonstrating that the used oil does not contain hazardous waste.

Solid wastes from beneficiation activities associated with mining operations (Bevill Exclusion to RCRA) that are exempt from being regulated as hazardous waste are listed under 40 CFR §261.4(b)(7):

> Beneficiation operations include crushing, grinding, washing, dissolution, crystallization, filtration, sorting, sizing, drying, sintering, pelletizing, briquetting, calcining, roasting in preparation for leaching (to produce a final or intermediate product that does not undergo further beneficiation or processing), gravity concentration, magnetic separation, electrostatic separation, flotation, ion exchange, solvent extraction, electrowinning, precipitation, amalgamation, and heap, dump, vat, tank, and in situ leaching.

Additionally, several exemptions are also listed in 40 CFR §261.3, which defines a hazardous waste. Some of the important exemptions that could be applied at the Greens Creek facilities include:

- Household waste (e.g. for products used for personal use at the camp facilities);
- Mine development rock returned to the mine site;
- Solid wastes from the extraction, beneficiation and processing of ores and minerals, also known as the Bevill Exemption (e.g. tailings);
- Non-tern plated used oil filters that are not mixed with a "listed hazardous waste" and have been gravity hot-drained; and
- Exemptions for mixtures which involve de minimis losses of certain hazardous wastes and laboratory wastewater discharged to water treatment systems regulated under an Alaska Pollutant Discharge Elimination System (APDES) permit.

It is important to note that *intentionally mixing a hazardous waste with a non-hazardous solid waste can render the entire mixture a hazardous waste, subject to the full RCRA regulations.* There are a few exemptions to the mixture rule, however, they are only applicable under very specific circumstances and must be managed carefully to maintain compliance with RCRA.

## 2.2 Waste Management Priorities

In accordance with the State of Alaska Statute AS 46.06.021, in order to prevent and/or minimize the present and future generation of wastes, management decisions that may affect waste generation at the Greens Creek Mine are made by considering the following order of priority options: 1) potential of materials excavated, mined, or milled to adversely affect water quality; 2) waste source reduction; 3) recycling; 4) waste treatment; 5) and waste disposal, in accordance with applicable law. To accomplish this, the following is systematically performed:

- Geochemical characterization of materials to be excavated, mined, or milled;
- Operations that generate wastes are routinely reviewed to identify opportunities for reducing waste and these opportunities are implemented whenever possible;
- The properties of materials are reviewed prior to purchase and every effort is made to minimize the use of hazardous materials and those that would be classified as hazardous wastes once they can no longer be used for their intended purpose;
- Methods for reusing and recycling materials are promoted and implemented whenever possible to reduce waste;
- Non-hazardous solid wastes that are permitted for disposal onsite are disposed of at onsite within, permitted, solid waste sites, regulated by the Alaska Department of Environmental Conservation, in accordance with 18 AAC 60 or applicable state/federal permits;
- Materials that cannot be managed onsite are routinely shipped offsite for recycling, reuse, treatment and/or disposal to appropriate facilities.

## 2.3 Geochemical Characterization of Materials to be Excavated, Mined, or Milled

Materials to be excavated for construction, waste rock from the mine used for construction, and mill tailings that could potentially affect water quality are geochemically characterized and managed if necessary to prevent degradation of water resources. Material characterization is performed using one or more of the established analytical procedures; multi-element analysis, Acid Base Accounting (ABA) and kinetic testing (40-weeks). These analytical tools are used when appropriate to accurately classify the material and their potential to affect water quality.

Tailings solids are regularly collected for ABA analysis, and development rock samples are collected from the Waste Rock Facility (Site 23) from each of the waste rock type pile locations (i.e., #1, #2 and #3 waste rock types). ABA analysis is also performed on waste rock samples. If any changes are seen in the geochemical results of analysis for the development rock or tailings, additional sampling and analysis are conducted as determined necessary.

Other materials that are excavated at construction sites, mined from borrow pits, or imported to the site are appropriately characterized prior to use.

## 2.4 Purchasing of Materials

The following procedures are followed when purchasing materials for the Greens Creek Mine:

- Whenever possible, the Greens Creek Mine minimizes the generation of hazardous wastes by avoiding the purchase of materials that are regulated as hazardous wastes when the materials are no longer required for their intended purpose.
- To the extent practical, materials are purchased in containers (e.g. totes or drums) that can be returned to the vendor.
- The Safety Data Sheets (SDSs) for new materials to be purchased are reviewed by Environmental and Health and Safety departments to ascertain if the materials require special management under RCRA, Emergency Planning and Community Right to Know Act (EPCRA), Comprehensive Environmental Responsibility and Compensation Liability Act (CERCLA), Clean Air Act, and Toxic Substances Control Act (TSCA) (See EPA’s "List of Lists").
- For materials requiring special handling and/or that are classified as a hazardous waste if disposed, HGCMC evaluates to determine if a suitable substitute is available that is considered “less hazardous”. Less hazardous can include a waste that would not be classified as a hazardous waste if disposed, would not require special handling under the above-noted Acts, would generate less waste when disposed, can be reused or recycled or is generally considered to have less of an

impact on the environment (e.g. a material with less discharges to the environment when treated and/or disposed).

## 2.5 Waste Minimization

Efforts to minimize waste begin at the purchasing phase, as discussed in the previous section, and continue on to the recycling and reuse of materials. Some examples of methods to minimize waste include:

- Use of primarily eco-friendly solvents in parts washers (e.g. Orange-Sol™ or SimpleGreen®):
    - Many solvents contain compounds that require that the solvent be managed as hazardous waste when disposed of and are harmful to the environment;
    - Parts washers reuse the same solvent repeatedly, thereby reducing the amount of waste solvent generated;
    - Use of eco-friendly solvents minimizes the volume of hazardous solvent generated (provided the solvent is not mixed with other wastes that would render the solvent mixture hazardous);
    - The use of eco-friendly solvents also minimizes the volume of other wastes that could be generated, such as rags. Rags used to wipe off chlorinated solvents must be managed as hazardous waste, just like the solvent.
- Use of low mercury, fluorescent lamps ("green end cap") and recycling of lamps and bulbs:
    - Many lamps must be regulated as hazardous waste once disposed of due to mercury and lead content. Recycling lamps prevents them from entering the waste stream;
    - Low mercury, fluorescent lamps are currently available. The mercury levels in these lamps are sufficiently low that they are not regulated as hazardous waste.
- Recycling or reuse of materials such as antifreeze, batteries, reusable light vehicle tires, scrap metal, and used oil, as discussed in Section 2.6 below;
- Returning containers to vendors or recycling them as scrap metal, which prevents the need for disposal of containers in landfills;
- Appropriate container management, including the provision of secondary containment and proper labeling:
    - Proper container management is *key* to reducing waste volumes;
    - Unlabeled containers holding unknown materials may require testing of the materials to determine the chemical constituents of the material, which can be costly;

  - Containers that are left uncovered and exposed to the elements may result in the material in the container becoming contaminated and unusable;
  - Containers without proper secondary containment that become damaged can result in the contamination of other materials, such as soil, and may cause harm to the environment or personnel.

- Prevention of mixing of hazardous wastes with non-hazardous wastes through waste segregation, established procedures and personnel training:
  - Mixing hazardous and non-hazardous wastes may result in the entire mixture being regulated as hazardous waste and should be avoided;
  - This is particularly important in the management of solvents and used oil.

## 2.6 Recycling and Reuse of Materials

The Greens Creek Mine recycles materials to the extent practical. Due to the logistics of shipping recycled materials from the mine site by air or barge and the costs associated with recycling materials, HGCMC re-evaluates the cost/benefit of their recycling program on a regular basis. Recycling opportunities vary based on the need for recycled materials, vendors available to handle recycled materials, costs, economic factors, etc. HGCMC adjusts its recycling practices to respond to these changes.

The alternative to recycling depends on the nature of the material. Materials that are considered hazardous (e.g. certain types of batteries) have a high priority for determining viable recycling alternatives since the only disposal alternative is offsite disposal in a hazardous waste disposal facility. Other materials that are not hazardous (e.g. scrap metal) may be disposed of onsite in an appropriate manner if recycling becomes impractical.

Some materials that may be recycled are discussed below. Due to the factors noted above, recycling of these materials may not always be possible or economically feasible, in which case the management methods are routinely reevaluated.

- Antifreeze (ethylene glycol) – recycled if possible or disposed of offsite;
- Cardboard and paper packaging material – bailed and shipped offsite for recycling;
- Hazardous batteries – returned to vendor for recycling or reclaimed offsite;
- Hazardous lamps – recycled offsite;
- Compressed gas cylinders – returned to vendor for reuse or recycled as scrap metal;
- Pallets – reused or burned on Site 23;
- Reusable Parts – sold/reused onsite or offsite where possible;
- Returnable/recyclable drums – returned to vendor for reuse and/or recycled as scrap metal;

- Scrap metal – recycled offsite;
- Used oil – burned for energy recovery in space heaters onsite (shipped offsite when not possible to burn for energy recovery onsite);

## 2.7 Waste Segregation

Waste management at the Greens Creek Mine includes appropriate segregation of wastes to ensure they are properly managed according to the applicable regulations and the specific waste handling procedures described in Section 4.0 as follows:

- All camp waste (e.g. putrescible food waste), is placed in a freezer van and shipped offsite for composting or disposal;
- Other camp waste (e.g. Household Municipal Waste) is shipped off site for disposal;
- Inert wastes destined for the TDF or disposal underground are either taken directly to these locations, or placed in specific areas such as the remuck bay for temporary storage prior to disposal;
- Hazardous wastes are placed in containers at Satellite Accumulation Areas (Section 2.11.3, for less than 55 gallons of waste) or placed in containers, appropriately labeled and brought directly to a Hazardous Waste Accumulation Area;
- Universal Wastes (lamps, batteries, mercury containing equipment) are placed in containers at Universal Waste Accumulation Areas according to the procedures outlined in Section 2.12;
- Electronics waste (e-waste) includes computer components, circuit boards, televisions, DVD players etc. are collected once deemed obsolete and are shipped offsite for recycling;
- Materials to be recycled are placed in segregated containers designated for the specific type of material and managed as outlined in Section 4.0;
- Mercury and mercury-containing materials are managed in compliance with all applicable regulations; and
- All containers are appropriately labeled and managed as described in Section 2.8 below.

## 2.8 Container Management

Containers are managed in accordance with all applicable regulations to ensure safety of personnel and the environment, and to prevent spills and contamination by the material contained as follows:

- All containers are appropriately labeled according to the US Department of Labor Occupational Safety & Health Administration (OSHA) or Mine Safety & Health Administration (MSHA) hazard communication standards (OSHA "HCS" at 29 CFR 1910.1200 or MSHA "HazCom" at 30 CFR 47), as described in Section 3.1;
- Hazardous wastes are labeled according to the requirements of RCRA:
    - Containers in Satellite Accumulation Areas must be labeled with words describing the contents of the container or the words "*Hazardous Waste*";
    - Containers in Hazardous Waste Accumulation Areas must be labeled with the words "*Hazardous Waste*" and the accumulation start date;
    - Containers holding Universal Waste must be labeled with the words "*Universal Waste – waste type*" "*Waste – waste type*" or "*Used – waste type*" where "*waste type*" is either batteries, lamps, thermostats or mercury containing equipment.
- Containers of used oil are labeled with the words "Used Oil";
- Hazardous materials are stored within appropriate secondary containment systems designed to contain at least 110% of the volume of the largest container within the containment. The containment are impermeable to the stored hazardous substances;
- Safety precautions listed in the SDS for each material stored are followed;
- Containers are kept closed except when adding or removing materials as required by RCRA for hazardous wastes or as needed to prevent contamination of the material, or harm to the environment or personnel;
- Inspections are conducted as required by the regulations and as needed to ensure containers are appropriately managed;
- Containers are emptied appropriately (see Section 2.8.1);
- Small containers of flammable materials are stored in flame resistant containers/cabinets;
- Incompatible materials are segregated;
- Appropriate firefighting and/or spill response equipment are available; and
- The applicable training, inspection, reporting, preparedness, prevention, contingency planning, and emergency procedures required by RCRA are implemented.

### 2.8.1 Procedures for Emptying Containers

An empty container is a non-hazardous waste provided it has been emptied according to the procedures described below. Residues from emptying the containers must be managed according to the hazard classification.

1. A container holding a *compressed gas* is considered empty when the pressure in the container approaches atmospheric pressure;
2. Containers that held an *acutely hazardous waste* (P-code wastes in 40 CFR §261.33), such as kepone, are considered empty when:
    a. The container or inner liner has been triple rinsed using a solvent capable of removing the material;
    b. The container or inner liner has been cleaned by another method that has been shown in the scientific literature, or by tests conducted by the generator, to achieve equivalent removal; or
    c. In the case of a container, the inner liner that prevented contact of the commercial chemical product or manufacturing chemical intermediate with the container has been removed.
3. Containers that held *hazardous waste* are considered empty when:
    a. All wastes have been removed that can be removed using the practices commonly employed to remove materials from that type of container, e.g., pouring, pumping, and aspirating, and
    b. No more than 1 inch (2.5 cm) of residue remain on the bottom of the container or inner liner, or
    c. No more than 3% by weight of the total capacity of the container remains in the container or inner liner if the container is less than or equal to 119 gallons in size; or
    d. No more than 0.3% by weight of the total capacity of the container remains in the container or inner liner if the container is greater than 119 gallons in size.
4. The Greens Creek Mine applies the standards for a container that held hazardous waste for all containers that held non-hazardous waste (other than compressed gas cylinder and aerosol cans), in addition to the following requirement:
    a. 55-gallon drums that are to be returned to the vendor are emptied to less than 1% residue.
5. Containers that have been appropriately emptied are labeled or tagged as “empty;”
6. All plugs or caps are replaced to ensure inlets/outlets are sealed from water or snow;
7. Marking, labeling or placarding required by the U.S. Department of Transportation's Hazardous Materials Regulations are retained until the packaging is sufficiently cleaned of residue and purged of vapors to remove any potential hazards; and
8. Until containers have been appropriately emptied and indicated as empty, they are kept in secondary containment where required and the labels, markings and placards are left in place.

## 2.9 Onsite Waste Management

Solid wastes management facilities at the Greens Creek Mine include inert solid waste underground disposal areas and the TDF. Potentially reactive materials (i.e. pyritic waste rock) are managed in waste rock Site 23, disposed of underground as backfill or used at the TDF.

These key waste management areas are regulated by ADEC under an Integrated Waste Management and Disposal Permit and are discussed in the following sections.

### 2.9.1 Solid Waste Disposal Sites

Surface and underground disposal sites are located within or on federal and patented mining claims meeting the approval or authorization as required by 18 AAC 60.20(b) (7) (B).

Solid waste disposal areas are located within the underground workings of the mine and at the TDF for the disposal of inert, non-hazardous solid waste and potentially reactive waste rock. These disposal areas are permitted by the ADEC in accordance with 18 AAC 60. The TDF site is located at mile 0.9 on the B access road between the Hawk Inlet Camp facilities and the 920-mine portal (Figure 3). Within the underground workings of the mine are designated areas to be backfilled as disposal sites considering options for structural backfill, disposal of inert waste materials, or final disposal of potentially reactive waste rock (*i.e. pyritic waste rock).*

In general, the TDF site is designed and operated to keep runoff from outside the facility area separate from the dry stack tailings, co-disposed waste rock, inert wastes, sewage sludge, etc. Visual monitoring inspections are conducted on the facilities to ensure compliance with the provisions of 18 AAC 60.

#### 2.9.1.1 Underground Mine Disposal

Waste rock generated in the underground workings of the mine is disposed of in designated areas where mining activities have ceased, and the material is permanently entombed underground. Waste rock that is not disposed of within the mine is disposed of at Site 23. A yet to be determined amount of the waste rock from the temporary storage sites will be co-disposed of with tailings at the TDF.

A portion (up to 50%) of the mill tailings is mixed with cement (5-8%) and used as structural backfill within the underground working of the mine.

#### 2.9.1.2 Mill and Hawk Inlet Facilities

Inert, general camp and mill refuse (e.g., no-recyclable packaging, non-recyclable empty containers, non-putrescible refuse, etc.) are placed in containers for disposal off site.

Cardboard is compressed, bailed and shipped off site for recycling, and wood scrap are burned at the TDF or Site 23. All tires are buried in designated areas underground.

### 2.9.2 Monitoring

The environmental monitoring implemented at the Greens Creek Mine is described in the "*Greens Creek Mine Integrated Waste Management Monitoring Plan*" This includes monitoring and characterization of surface water, fish monitoring, benthic invertebrate monitoring, and aquatic plant monitoring. Surface and ground water monitoring and sampling in addition to other monitoring of facilities as required by ADEC under 18AAC 60.800-60.860.

### 2.9.3 Reporting and Record Keeping

Regular reporting is provided on waste management activities and results of environmental monitoring, as required by the waste management permit. Operating records are maintained onsite, as specified in 18 AAC 60.235.

## 2.10 Materials to be Managed Offsite

Certain materials are shipped offsite for recycling or disposal, including some of the recyclable materials listed in Section 2.6, in addition to liquid wastes and hazardous wastes. These materials are segregated, as described in Section 2.7 and ultimately delivered to the mine site Warehouse or Hawk Inlet facility for processing as described below. The 920 Warehouse is located approximately 200 feet east of the mill building (Figure 5).

- All materials received at the Warehouse are verified for appropriate labeling (e.g. type of material, date waste generated, etc.);
- Containers are assigned a unique container number and entered into an inventory;
- Testing is conducted, if required, to ensure materials are appropriately characterized;
- The material is placed in an appropriate accumulation area (e.g. Hazardous Waste Accumulation Area);
- Accumulated material designated to be shipped offsite are temporarily stored at Hawk Inlet (Figure 2);
- The material is shipped to an appropriate recycling and/or disposal facility depending on the type of material (e.g. solid or hazardous waste);
- All materials are shipped in accordance with the applicable regulations, including those mandated by the US Department of Transportation Pipeline and Hazardous Materials Safety Administration (Hazardous Materials Regulations), RCRA, International Civil Aviation Organization (ICAO), International Air Transport Association (IATA) and International Maritime Dangerous Goods (IMDG) code.

## 2.11 Hazardous Waste Management

The requirements for managing hazardous waste are found in the RCRA regulations, 40 CFR 260 to 282. The specific requirements that apply to a particular waste depend mainly on the classification of the waste generated and the generator status, which is based on the quantity of waste generated in a month and the total quantity of waste accumulated onsite at any one time. There are three categories of Generator Status:

- Very Small Quantity Generator (VSQG) – Generates 220 lb. (100 kg) or less of hazardous waste per month and the quantity of waste accumulated onsite does not exceed 2,204 lbs. (1,000 kg)[2];
- Small Quantity Generator (SQG) – Generates greater than 220 lb. (100 kg) but less than 2,204 lb. (1,000 kg) of hazardous waste in a calendar month and the quantity of waste accumulated onsite does not exceed 13,228 lbs. (6,000 kg);
- Large Quantity Generator (LQG) – Generates 2,204 lbs. (1,000 kg) or more of hazardous waste in a month.

The Greens Creek Mine maintains an inventory of the volumes of hazardous waste generated each month and the total volume of hazardous waste onsite to ascertain its generator status and complies with the applicable regulations. The regulations that apply to each generator status are outlined in Table 2-1.

[2] Additional storage limits for acute hazardous waste and residues or materials resulting from the spill of an acute hazardous waste are shown in Table 2-1.

**Table 2-1: Applicable Regulations for Hazardous Waste Generators**

| | VSQG | SQG | LQG |
|---|---|---|---|
| **Quantity Limits** | ≤ 220 lb. (100 kg) /month<br>≤ 2.2 lb. (1 kg) /month of acute hazardous waste<br>≤ 220 lb. (100 kg)/ month of acute spill residue or soil | Between 220 – 2,204 lb. (100 - 1,000 kg) /month | ≥ 2,204 lb. (1,000 kg) /month<br>> 2.2 lb. (1 kg) /month of acute hazardous waste<br>> 220 lb. (100 kg) /month of acute spill residue or soil |
| **EPA ID Number** | Not required | Required | Required |
| **On-Site Accumulation Quantity** | ≤ 2,204 lb. (1,000 kg)<br>≤ 2.2 lb. (1 kg) acute<br>≤ 220 lb. (100 kg) of acute spill residue or soil | ≤ 13,228 lb. (6,000 kg) | No limit |
| **Accumulation Time Limits** | None | ≤180 days or<br>≤270 days (if greater than 200 miles) | ≤90 days |
| **Storage Requirements** | None | Basic requirements with technical standards for tanks or containers | Full compliance for management of tanks, containers, drip pads, or containment buildings |
| **Waste Must be Shipped to** | State approved or RCRA permitted/interim status facility | RCRA permitted/interim status facility | RCRA permitted/interim status facility |
| **Manifest** | Not required | Required | Required |
| **Biennial Report** | Not required | Not required | Required |
| **Personnel Training** | Not required | Basic training required | Required |
| **Contingency Plan** | Not required | Basic plan | Full plan required |
| **Emergency Procedures** | Not required | Required | Full plan required |
| **USDOT Transport Requirements** | Yes<br>(if required by USDOT) | Yes | Yes |

Source: EPA website - http://www.epa.gov/osw/hazard/generation/summary.htm

### 2.11.1 Hazardous Waste Determinations

As required by 40 CFR §262.11, hazardous waste determinations are made on all solid wastes generated. Determinations could be made by reviewing the regulations, testing the waste and/or applying generator knowledge.

### 2.11.2 Hazardous Waste Accumulation

The following procedures are followed while hazardous wastes are accumulated at the Greens Creek Mine project:

- In general, hazardous wastes are accumulated in Satellite Accumulation Areas. Once containers become full (55 gallons or less), they are delivered to a Hazardous Waste Accumulation Area within three days of becoming full;
- Wastes that are not accumulated in a Satellite Accumulation Area, such as wastes generated infrequently, are delivered to a Hazardous Waste Accumulation Area immediately;
- All wastes are shipped offsite within the required timeframe from their accumulation start date based on the generator status during the month the waste was generated;
- All containers are appropriately labeled as described in Section 2.8 and managed according to the applicable regulations (see Table 2-1).

### 2.11.3 Satellite Accumulation Areas

Up to 55 gallons of hazardous waste or one quart of acutely hazardous waste can be accumulated in Satellite Accumulation Areas provided the requirements of 40 CFR §262.34(c) are met. Containers must be at or near the point of generation of the wastes; under the control of the operator of the process generating the waste; in good condition; made of or lined with materials that are compatible with the waste; kept closed at all times (except when adding/removing waste); opened, handled and stored in a manner that prevents ruptures or leaks; and labeled with the words “Hazardous Waste” or a description of the contents (Appendix A). This allows the accumulation of waste without a time limit until a container becomes full. Once a container in a Satellite Accumulation Area becomes full, the date must be written on the label. Full containers will then be transferred to a Hazardous Waste Accumulation Area within three days of becoming full.

### 2.11.4 Shipments of Hazardous Waste

Hazardous wastes are shipped offsite to appropriate facilities in accordance with the applicable requirements of USDOT (see Section 3.6). Additional requirements apply depending on the mode of shipment, as mandated by the International Civil Aviation Organization (ICAO), International Air Transport Association (IATA) and International Maritime Dangerous Goods (IMDG) code. Shipments are accompanied by a Hazardous Waste Manifest and the appropriate Land Disposal Restriction (LDR) Notification and Certification forms where applicable.

## 2.12 Universal Waste Management

The Universal Waste regulations (40 CFR 273) are streamlined hazardous waste management regulations that can be applied to the management of the following hazardous wastes: batteries, pesticides, mercury-containing equipment and lamps. Generators of these wastes can choose to manage them as Universal Waste rather than under the more complex hazardous waste requirements. The intent of the Universal Waste regulations is to promote and facilitate the recycling and proper handling of these widely generated hazardous wastes.

The main types of Universal Wastes likely to be generated at the Greens Creek Mine include batteries, mercury-containing equipment and lamps. The Greens Creek Mine is a *Small Quantity Generator of Universal Waste,* meaning that *less than 11,000 lbs. (5,000 kg) of Universal Waste would be accumulated onsite at any time*.

Universal wastes are managed in accordance with the regulations in 40 CFR 273. This includes accumulation in appropriate containers that are labeled as specified in 40 CFR § 273.14, using a method that clearly demonstrates the length of time that the Universal Waste has been accumulated from the date it became a waste or was received.

The Greens Creek Mine trains all employees who handle or have responsibility for managing Universal Waste in the proper handling and emergency procedures appropriate to the type(s) of Universal Waste handled.

All releases of Universal Waste and other residues from Universal Wastes are immediately contained. A determination is made as to whether any material resulting from the release is hazardous waste, and if so, it is managed in compliance with all applicable requirements of 40 CFR parts 260 through 272.

Universal Waste materials are sent offsite to another Universal Waste Handler or a permitted destination facility[3] within one year of the accumulation start date. Universal Wastes meeting the definition of a hazardous material under the USDOT regulations are packaged, labeled, marked and placarded and appropriate shipping papers are prepared according to the applicable USDOT regulations under 49 CFR 171 through 180.

[3] *Destination facility* means a facility that treats, disposes of, or recycles a particular category of Universal Waste, with the exception of the management activities described in 40 CFR § 273.13 (a) and (c) and 40 CFR § 273.33 (a) and (c).

## 2.13 Used Oil Management

*Used oil* is defined as "any oil that has been refined from crude oil or any synthetic oil that has been used and as a result of such use is contaminated by physical or chemical impurities" and is regulated under RCRA, 40 CFR 279.

Mixing used oil with other hazardous wastes may render the mixture a hazardous waste, in which case the mixture could no longer be managed as used oil. Mixtures of used oil are regulated as follows:

- A mixture of used oil and a listed hazardous waste is regulated as *hazardous waste*;
- A mixture of used oil and a characteristic hazardous waste or a listed hazardous waste that is listed solely because it exhibits one or more hazardous waste characteristic is regulated as:
    - *Hazardous waste* if the mixture exhibits any characteristic of hazardous waste; and
    - *Used oil* if the mixture does not exhibit a characteristic of hazardous waste;
- Note that used oil containing more than *1,000 ppm of halogens* is presumed to be *hazardous waste* (referred to as the "rebuttable presumption for used oil"). This presumption can be rebutted if the generator can prove that the used oil was not mixed with hazardous waste.

Used oil generated at the Greens Creek Mine that meets the requirements to be regulated as used oil is burned for energy recovery in space heaters when possible. Used oil that must be regulated as hazardous waste is shipped offsite to an appropriate facility for handling.

The general requirements for managing used oil include:

- Records of used oil burned onsite and shipped offsite are prepared, as specified in 40 CFR 279;
- Containers are in good condition and labeled with the words "Used Oil";
- Any records produced as part of the management of used oil are kept on file for at least three years;
- Containers are provided with secondary containment as required under the applicable regulations (40 CFR 112 and 18 AAC 75).

## 2.14 Employee Training

Employees handling hazardous materials are trained in the appropriate and safe handling of these materials as required by MSHA, RCRA and/or USDOT based on the duties of the employees. This includes:

- Employees of Small and Large Quantity Generators of hazardous waste involved in handling hazardous wastes must be trained[4] on proper waste handling and emergency procedures relevant to their responsibilities during normal facility operations and emergencies;
- Employees of Small Quantity Handlers of Universal Waste are trained on proper handling and emergency response procedures appropriate for the type of Universal Waste handled;
- Personnel involved in shipping hazardous materials and wastes, including preparing packages, preparing/signing/reviewing manifests, loading/unloading materials, and transporting materials, have or will complete the appropriate USDOT Hazardous Materials (Hazmat) transportation training (49 CFR §172.704);
- Employees handling hazardous materials are trained according to the hazard communication standard under MSHA;
- Employees are required to complete the mandatory 40-hour new miner training and annual 8-hour refresher course required under MSHA.

Records of training are maintained on file according to the applicable regulations.

[4] The amount and/or type of training required for hazardous waste generators is dependent on the amount of hazardous waste generated by the facility in a calendar month. According to 40 CFR Section 262.34(a) (4), generators who generate more than 1,000 kg/month of hazardous waste (or more than 1 kg/month of acutely hazardous waste) (LQG) must comply with the emergency preparedness and personnel training requirements in Section 265.16. Generators who generate greater than 100 kg but less than 1,000 kg/month of hazardous waste (SQG), must comply with the emergency preparedness and personnel training requirements in Section 262.34(d)(5). The training requirements do not apply to generators of less than 100 kg/month (e.g., conditionally exempt small quantity generators)

# 3.0 Hazardous Materials Management

## 3.1 Handling and Storage of Hazardous Materials

Hazardous materials are handled and stored in the workplace according to the US Department of Labor and Mine Safety and Health Administration (MSHA) hazard communication standards, which require the following:

- The preparation and implementation of a written hazard communication program;
- Proper labeling of all hazardous materials, including the hazard classification;
- Retention of marking, labeling or placarding required by the USDOT's Hazardous Materials Regulations until the packaging is sufficiently cleaned of residue and purged of vapors to remove any potential hazards;
- Safety Data Sheets (SDS) readily available for all hazardous materials in the work place;
- Training of personnel handling hazardous materials; and
- Inspections to check for compliance with the standards.

All materials are stored based on the hazard classifications identified in their SDSs and in compliance with the applicable OSHA or MSHA regulations. Incompatible materials are segregated accordingly. Fuel and explosives are stored in separate, designated areas, segregated from other chemicals.

Additionally, secondary containment is provided as required by the federal Oil Pollution Prevention regulations in 40 CFR 112 and the State of Alaska Oil and Other Hazardous Substances Pollution Control regulations in 18 AAC 75. Hazardous wastes are handled and stored according to the Resource Conservation and Recovery Act (RCRA) regulations.

## 3.2 Specific Hazardous Materials Handling Procedures

Certain hazardous materials require special handling, including the key materials discussed below.

### 3.2.1 Explosives

Explosives are stored and handled according to the MSHA regulations contained in 30 CFR 56. Explosives are also handled and transported according to the regulations of the Bureau of Alcohol, Tobacco, Firearms and Explosives, US Department of Transportation Pipeline and Hazardous Materials Safety Administration and the US Coast Guard (USCG). All detonators and bagged products are stored in an explosives magazine meeting all applicable federal and state safety and security requirements.

Charges and detonators are shipped separately under the control of the explosives supplier. Transport companies that handle these cargoes have the appropriate certification and licenses. Although components used to produce the blasting require special handling, as detailed in 33 CFR § 126.28, they are shipped along with the rest of the general cargo destined for the mine site.

## 3.3 Inventory of Hazardous Materials

An inventory of all hazardous materials used and stored at the site is maintained for the Greens Creek Mine. This includes the quantities of materials used and stored annually, locations of storage, type of storage, etc.

Inventories of the locations of Hazardous Waste, Universal Waste and Satellite accumulation areas are also being maintained, in addition to the locations of lead acid battery accumulation areas.

## 3.4 Safety Data Sheets (SDS)

SDSs for each hazardous material are maintained online (Sitehawk) and are kept up-to-date and made readily available to employees and contractors employed at the Greens Creek Mine.

## 3.5 Inspections

Inspections of hazardous materials are conducted as required to ensure hazardous materials are being handled appropriately and in compliance with all applicable regulations and in accordance with the inspection requirements of applicable permits and/or plans.

## 3.6 Transportation of Hazardous Materials

Hazardous materials are transported in accordance with all applicable regulations, including, but not limited to, the following requirements:

- Containers are prepared for shipment according to the requirements of 49 CFR Part 172 for the preparation of shipping papers, marking, labeling and placarding;
- Materials are packaged according to 49 CFR Parts 173, 178 and 179;
- Emergency response information are provided and maintained according to 49 CFR 172 (Subpart G);
- Personnel involved in the transportation of hazardous materials are trained according to 49 CFR 172 (Subpart H);
- Where applicable, Safety and Security Plans are developed and implemented in accordance with 49 CFR 172 (Subpart I);

- Transportation of hazardous materials by aircraft are conducted in accordance with 49 CFR 175; and
- Transportation of hazardous materials by vessel are conducted in accordance with 33 CFR 126 and 49 CFR 176, which includes requirements for general handling, stowage, and segregation, port security, and the preparation of a Dangerous Cargo[5] Manifest, in addition to specific requirements for the various classes of hazardous materials.

Where applicable, international shipments of hazardous materials are shipped in accordance with the following regulations:

- International Civil Aviation Organization's Technical Instructions for the Safe Transport of Dangerous Goods by Air (ICAO Technical Instructions);
- International Maritime Dangerous Goods Code (IMDG Code);
- Transport Canada's Transportation of Dangerous Goods (TDG) Regulations; or
- International Atomic Energy Agency Regulations for the Safe Transport of Radioactive Material (IAEA Regulations).

## 3.7 Employee Training

Employee training is discussed under Section 2.14.

## 3.8 Reporting Requirements

The purchase, use and release of certain hazardous substances require reporting under a variety of regulations, including:

- Releases of hazardous substances must be reported as outlined in Section 5.1, *Spill Reporting*.
- Emergency Planning & Community Right-To-Know Act (EPCRA) requirements of regulated facilities include:
  - Emergency planning and notification, including notification of releases of hazardous substances to the Local Emergency Planning Committee (LEPC) and State Emergency Response Commission (SERC);
  - Hazardous chemical reporting through the provision of SDSs and/or inventories of hazardous chemicals (e.g. Tier II inventory) to the LEPC, SERC and/or fire department having jurisdiction over the facility; and

[5] Dangerous cargo is defined in 33 CFR §126.3 as all hazardous materials listed in 49 CFR parts 170 through 179, except those materials preceded by an “A” in the Hazardous materials Table in 49 CFR §172.101 and all cargo listed in 46 CFR part 148.

  - Information on toxic chemical releases and waste management activities reported annually to the EPA through the Toxic Release Inventory (TRI) Program.

- Inventory Update Reporting (IUR) under the Toxic Substances Control Act (TSCA) requires reporting of manufacturing and/or importing of certain substances at or above a threshold quantity.
- The Department of Homeland Security (DHS) Chemical Facility Anti-Terrorism Standards (CFATS) require that facilities that possess any chemical on the CFATS (Appendix B): DHS Chemicals of Interest List complete a Top-Screen assessment to determine if they meet the CFATS criteria for high-risk chemical facilities.

# 4.0 Specific Waste/Material Handling Methods

The following sections describe the specific management methods that are followed for waste streams and other materials generated at the Greens Creek Mine. Adherence to these methods by employees and contractors is essential in order to ensure the project operates in compliance with all applicable regulations and permits, and to ensure the safety and protection of employees, contractors, and the environment.

This Plan will be kept updated as needed, for example, as new waste streams are added, due to changes in procedures or processes or in response to modifications to the applicable regulations.

## 4.1 Absorbents/Floor Dry

Absorbents, including absorbent pads, socks and booms, floor dry, and floor sweep are commonly used to collect spilled products. The disposal of absorbents is dictated by the material collected on the absorbent:

- Absorbents used to collect petroleum products are considered *non-hazardous waste once no free liquid can drain from the absorbent*. These absorbents are shipped offsite for energy recovery or disposal. The collected liquid is managed as used oil.
- Absorbents managed as *hazardous waste* are those contaminated with a material that is classified as hazardous waste if disposed of. These absorbents are shipped offsite to an appropriate facility (e.g. RCRA approved Treatment Storage and Disposal Facility). Any collected liquid that cannot be used for its original purpose is also shipped offsite to an appropriate facility.
- Absorbents managed as *non-hazardous waste* are those contaminated with a non-hazardous material. These absorbents collected and shipped offsite for energy recovery or final disposal. Collected liquid that cannot be reused or managed onsite are shipped offsite to an appropriate facility.

## 4.2 Antifreeze/Coolant

Ethylene glycol is commonly referred to as antifreeze or coolants. Ethylene glycol is typically used as a coolant in equipment such as vehicles and generators. Glycol is managed as follows:

- Used glycol is shipped offsite for recycling or disposal.
- Glycol that is found to be a hazardous waste is shipped offsite to an appropriate facility.

## 4.3 Asbestos

The presence of asbestos will be determined prior to any demolition or renovation activities. Certified and trained asbestos abatement contractors would be used for any

required asbestos removal activities. It is not expected to encounter asbestos, but if the material is encountered, removal and disposal will follow 40 CFR 61, Subpart M. Any asbestos containing material purchased and brought to site is documented and tracked.

## 4.4 Assay Lab Waste

Wastes generated from the assay lab that contain lead are recycled through the mill. Other non-hazardous wastes are placed in containers for disposal off site.

Assay lab acid wastes are neutralized[6] and pumped into the process plant.

- Laboratory sample preparation wastes, crucibles, cupels, flux, and slag are returned to the process to recover any valuable minerals.
- Fire Assay baghouse filters are recycled through the mill to recover metals.
- Personnel Protective Equipment (PPE), i.e. gloves, masks, respirator cartridges, etc. are tested[7] to determine if they are hazardous. PPE found to be a *hazardous waste* are shipped offsite to an appropriate facility. *Non-hazardous waste* PPE are disposed of onsite.

## 4.5 Batteries

Batteries that are used onsite include alkaline, lithium, nickel cadmium, nickel metal hydride, and lead acid batteries. *Non-hazardous waste* batteries are shipped offsite for recycling or landfilled in designated underground areas. Hazardous batteries are managed as *Universal Waste* (40 CFR part 273) and shipped offsite for recycling. Lead-Acid batteries are shipped offsite for reclamation. A brief description of the battery types and management methods is provided below:

- Alkaline batteries are commonly used disposable batteries. Alkaline batteries are managed as *non-hazardous waste*;
- There are several types of lithium batteries, including rechargeable lithium-ion (Li-ion) and lithium-polymer (Li-poly) batteries and disposable lithium batteries such as lithium sulfur dioxide batteries (Li-$SO_2$). Lithium batteries are managed as *Universal Waste*;
- Nickel metal hydride (NiMH) batteries are commonly used rechargeable batteries. NiMH batteries are managed as *non-hazardous waste*;
- Nickel Cadmium batteries, also known as NiCad batteries are rechargeable batteries. NiCad batteries are managed as *Universal Waste*;

[6] For materials meeting the characteristic of corrosivity (40 CFR §261.22), these activities are conducted according to the RCRA requirements for an elementary neutralization unit (40 CFR 260.10).
[7] Testing for the characteristic of toxicity is conducted according to the Toxicity Characteristic Procedure (TCLP), EPA test Method 1311in "*Test Methods for Evaluating Solid Waste, Physical/Chemical Methods*", EPA Publication SW-846.

- Lead acid batteries are used in vehicles and equipment; smaller, sealed lead acid batteries are used in miner lights. Spent lead acid batteries are managed as *exempt* from the hazardous waste regulations *if reclaimed* (40 CFR §273.2).

## 4.6 Building Demolition Materials

A complete survey of any building or structure to be demolished are made prior to demolition to assess the potential environmental concerns and to determine appropriate management methods for any wastes or recyclable materials generated. If removal of asbestos is necessary, the procedures in Section 4.3 are followed.

## 4.7 Camp Waste

Household-type waste generated from employees and contractors at the project site camp facilities, including employee/contractor rooms, cafeteria and kitchen are shipped offsite for disposal. This is to ensure that no putrescible wastes are placed in the TDF and no wildlife are attracted to the area.

- Food scraps are frozen and sent to a landfill.
- Cooking oil and grease from the kitchen are sent to a biodiesel company in Washington State;
- Other industrial-type wastes generated by maintenance and housekeeping activities are managed according to the procedures for the specific waste provided in this Plan;
- Aerosol cans are punctured at an aerosol can puncturing unit (see Section 4.9.3);

## 4.8 Chemicals / Reagents

The requirements for handling chemicals and reagents that have spilled or can no longer be used for their intended purpose varies depending on the type of chemical or reagent.

- The following materials used in the assay lab are considered non-hazardous waste and are reprocessed through the mill, ultimately ending up in with the tailings:
    - Borax
    - Silica Sand
    - Soda Ash
- The chemicals/reagents listed below require special handling. Every effort is made to return these chemicals to the process to be used for their original purpose. If this is not possible, the chemicals are shipped offsite to an appropriate facility.
    - Sodium Nitrate (refinery)
    - Isopropyl Xanthate

- Methyl Isobutyl Carbinol (MIBC)
- 2-Mercaptobenzothiazole and Dithiophosphinate (Aero 404 and Aerophine 3418A)
- Muriatic Acid
- Sulfuric Acid
- Lime (calcium oxide)
- Sodium Cyanide
- Sodium Hydroxide (caustic soda)
- Flocculents
- Sodium Nitrate
- Copper Sulfate
- Zinc Sulfate
- Ferric Chloride
- Hydrogen Peroxide
- Fluxes
- Water Softening and Anti-Scalant Agents
- Polyoxyparafins
- Urea

## 4.9 Containers/Packaging

All containers and packaging must be emptied appropriately prior to disposal, reuse onsite or return to vendor, according to the requirements in Section 2.8.1. The application of "empty" label or tag is indication that containers have been appropriately emptied. *Until containers have been appropriately emptied and indicated as empty*, they are kept in secondary containment and the original labels, markings and placards are left in place.

### 4.9.1 Empty Drums

- Drums that contained acutely hazardous waste are emptied according to Item (2) in Section 2.8.1, which requires triple rinsing;
- Drums that contained all other materials are emptied according to Items (3) and (4) of Section 2.8.1, which requires emptying containers according to the RCRA requirements for hazardous waste;
- Additionally, as required by the vendor, 55-gallon drums that are returned to the vendor are emptied to less than 1% residue;
- All plugs or caps are replaced to ensure inlets/outlets are sealed from water or snow;

- Empty drums are recycled whenever possible by returning them to the vendor;
- Drums to be recycled as scrap metal are crushed prior to shipment offsite;
- All large, non-recyclable containers (over 5 gallons) are crushed prior to being shipped offsite or disposed of in the designated underground disposal area. The generators of the containers are responsible for ensuring containers are crushed prior to delivery for final disposal.

### 4.9.2 Compressed Gas Cylinders

Compressed gas cylinders include those containing oxygen, acetylene, propane, ether, carbon dioxide, argon and nitrogen:

- The majority of large cylinders are returned to the vendor and refilled;
- Cylinders are segregated by type and are managed according to safe handling procedures for compressed gas cylinders, which includes ensuring they are stored upright in a dry, cool, well-ventilated, secure area, protected from the weather, away from combustible materials and secured;
- Smaller cylinders such as those containing ether or propane, are purged of their contents using a cylinder recycling apparatus, such as the ProSolv® unit. The purged cylinders are recycled as scrap steel.

### 4.9.3 Aerosol Cans

- All aerosol cans other than the ones containing glue or spray foam are punctured and drained using onsite aerosol can puncturing units located at designated *Satellite Accumulation* areas throughout the property;
- Cans containing glue or spray foam are shipped offsite to an appropriate facility (e.g. RCRA approved Treatment Storage and Disposal Facility);
- A puncturing unit like the Aerosolv® brand or equivalent is used. The puncturing device is attached directly to the 2 inch-bung of a 30-gallon can. Cans are punctured with a non-sparking puncture pin and the liquid is collected in the drum. A filter is attached to the ¾ inch-bung on the drum to collect volatile organic compounds (VOCs);
- The punctured and drained aerosol cans are considered *non-hazardous waste* and recycled as scrap metal;
- Residues and filters from puncturing aerosol cans are either tested to determine if they are hazardous waste or just treated as such. Typically, these wastes must be managed as *hazardous wastes* and are shipped to an appropriate facility.

## 4.10 Contaminated Soil

The following sections describe procedures for handling specific types of contaminated soil.

### 4.10.1 Petroleum Contaminated Soil

- Petroleum contaminated soil is considered a *non-hazardous waste* and is collected and shipped offsite;
- The management of soil contaminated with petroleum products (e.g. oil) depends on whether the contaminated soil is inside or outside the underground operations, as described below:
    - Contaminated soil from the underground mine workings is removed and treated offsite or in some cases processed through the mill for recovery of any valuable minerals.
    - Soil samples for spills outside of the underground workings are collected depending on the size and location of the spill and based on regulatory guidance to verify that the spill area has been cleaned up appropriately according to the appropriate ADEC soil cleanup levels (18 AAC 75).

### 4.10.2 Caustic/Acid Releases outside the Mill and Secondary Containment

- Caustic compounds are also known as bases or alkaline compounds and have a pH greater than 7. Examples include potassium hydroxide, ammonia and sodium hydroxide.
- Acidic compounds have a pH of less than 7. Examples include sulfuric, hydrochloric and nitric acid (inorganic) or acetic and formic acid (organic).
- Where required, releases of caustic and acid are neutralized onsite and managed as *non-hazardous waste* either in situ or by removing the contaminated soil and subsequently neutralizing it as follows[8]:
    - Caustic spills – neutralize with a weak acid, preferably with a product specifically designed to neutralize caustic spills (e.g. Spill-X-C®);
    - Acid spills – neutralize with a weak base, preferably with a product specifically designed to neutralize acidic spills (e.g. Spill-X-A®);
    - Neutralizing caustic or acid spills can produce a violent reaction; therefore weak neutralizers must be used.
- Confirmation samples are collected when required. For in situ remediation, if the material has been appropriately neutralized, it is left in place. Otherwise, the material is removed and neutralized.

[8] For materials meeting the characteristic of corrosivity (40 CFR §261.22), these activities are conducted according to the RCRA requirements for an elementary neutralization unit (40 CFR 260.10)

- Contaminated soil that has been neutralized is left in situ, placed in the designated underground disposal area, TDF, or used as fill where needed.

## 4.11 Filters

There are a number of filters, including those from vehicles, buildings, baghouses, aerosol can puncture devices, assay lab, etc. In general, filters classified as non-hazardous waste are shipped offsite or recycled as scrap metal. Filters classified as hazardous waste are shipped offsite to an appropriate facility (e.g. RCRA approved Treatment Storage and Disposal Facility);

The following sections describe procedures for managing filters collected throughout the facilities:

- Filters from the fire assay baghouse may contain lead and are recycled through the mill to recover metals;
- Filters from aerosol can puncturing units are typically *hazardous waste* and are managed as described in Section 4.9.3;
- The majority of the filters from vehicles, equipment and buildings onsite are *non-hazardous waste* and are recycled as scrap metal. *Hazardous waste* filters are shipped offsite to an appropriate facility (e.g. RCRA approved Treatment Storage and Disposal Facility);
- Filter cloths from the milling process are disposed of in designated underground areas.
- Used oil filters include oil filters from vehicles or equipment and fuel filters from diesel equipment:
    - They are considered *exempt* from hazardous waste regulations if they are "non-terne-plated" and gravity hot-drained according to one of the methods described below:
        - Puncturing the filter anti-drain back valve or the filter dome end and hot-draining;
        - Hot-draining and crushing; or
        - Dismantling and hot-draining.
    - Note that hot-draining means the oil or diesel must be hot ($\geq$60ºF) and drained for a period of at least 12 hours;
    - Once appropriately gravity hot-drained, they are recycled as scrap metal;
    - Drained oil or diesel is collected and managed as used oil. Containers are be marked "Used Oil";
    - Used oil filters are managed as used oil until appropriate gravity hot-drained, with containers marked "Used Oil";
    - Used oil filters, once drained, are shipped offsite for recycling.

## 4.12 Food Waste (Putrescibles)

Food waste from the Hawk Inlet facilities are incinerated onsite:

- Food wastes from the kitchen and dining room are placed in designated trash cans and then transferred to a freezer van outside the Cannery. From there it is shipped offsite for composting or disposal;
- Non-putrescible waste from the kitchen, dining room and camp rooms, are compacted and shipped offsite for disposal;

Food waste collected at the mill and mine are placed in closed containers and shipped offsite for disposal. These waste management practices ensure that putrescibles are not disposed of onsite in order to prevent attraction of wildlife;

## 4.13 Light Bulbs/Lamps

Many used bulbs are considered hazardous waste when disposed of. They can be managed as *Universal Waste* if intact. Bulbs classified as hazardous waste that are intentionally broken or crushed must be managed as *hazardous waste*. HGCMC maintains a list of offsite facilities that recycle bulbs.

### 4.13.1 Hazardous Lamps

- Lamps containing mercury include fluorescent bulbs, high intensity discharge (HID) bulbs and neon/argon lamps. Examples of HID bulbs include mercury vapor, metal halide, and high-pressure sodium bulbs, as well as blue plasma vehicle headlights. The lamps may be classified as *hazardous waste* when disposed of;
- Many lamps contain lead in the solder, which cause them to be classified as *hazardous waste* when disposed of, including incandescent lamps;
- Used bulbs that are intact and classified as hazardous waste are managed as *Universal Waste* and shipped offsite;
- Used bulbs classified as hazardous waste that are intentionally broken or crushed are managed as *hazardous waste* and shipped offsite.

### 4.13.2 Non-Hazardous Lamps

- Environmentally friendly, low mercury, fluorescent lamps (“green end cap”) are currently available, which are classified as *non-hazardous waste* when disposed of. HGCMC purchases environmentally friendly fluorescent bulbs whenever possible;
- Halogen lamps are also typically *non-hazardous waste*;
- Non-hazardous lamps are shipped offsite intact for recycling.

## 4.14 Lubricants / Petroleum Products

### 4.14.1 Brake Fluid

- Brake fluid is managed as used oil and burned for energy recovery.

### 4.14.2 Grease

- Used grease that cannot be used onsite is shipped offsite for disposal;
- Grease buckets and other containers with less than 3% residue remaining in the container are considered empty and are crushed and disposed of within the designated underground disposal areas;
- Grease-contaminated trash is shipped offsite for disposal.

### 4.14.3 Used Oil

- Used oil generated at the Greens Creek Mine that meets the applicable RCRA regulatory requirements are burned in space heaters to recover energy (see Section 2.13 and for the used oil management requirements);
- Used oil that cannot be used onsite is shipped to an offsite facility;
- All used oil containers must be labeled "Used Oil" and contained in appropriate secondary containment;
- Quantities of used oil generated and burned for energy recovery or shipped offsite is logged.

## 4.15 Miscellaneous Materials

- Use of Styrofoam is discouraged at the site, but waste Styrofoam products are disposed of within the designated underground disposal areas. Styrofoam "peanuts" and other small pieces are placed in boxes or bags prior to disposal to ensure confinement prior to final disposal.
- Draeger test tubes may be *non-hazardous waste* or *hazardous waste* depending on the type. *Non-hazardous waste* tubes are disposed of onsite. *Hazardous waste* tubes are shipped offsite to an appropriate facility.
- Fiberglass insulation is disposed of onsite.
- Hoses are drained to the extent they will not drip any previous contents and disposed of within the designated underground disposal areas or shipped offsite.
- Plastic materials are placed within the designated underground disposal areas or shipped offsite.
- Rubber products are placed within the designated underground disposal areas or shipped offsite. If the rubber products are If contaminated, a waste determination need to be made, and the material handled accordingly.

## 4.16 Oily Waste

Oil or grease contaminated rags, pads, gloves or absorbents are considered *non-hazardous waste once no free liquid can drain from the absorbent*. These absorbents are collected, placed into shipping containers, and shipped offsite for disposal. The collected liquids are managed as used oil.

## 4.17 Paints

- Every effort is made to use paints for their intended purpose rather than dispose of them;
- Water-based, latex or acrylic paint – paint in solid form or painting materials (e.g. rags, brushes, rollers) are *non-hazardous waste* and are disposed of within the designated underground disposal areas or shipped offsite;
- Paint in liquid form is shipped offsite;
- Oil-based paints – paint in solid form[9] or painting materials are *non-hazardous waste* and are disposed of within the designated underground disposal areas or shipped offsite;
- Paint in liquid form is *hazardous waste* and is shipped offsite;
- Thinners and solvent-based or lead-based paint – paint in liquid or solid form or painting materials may be *hazardous waste* and are characterized and managed accordingly.

## 4.18 Radioactive Materials

Radioactive materials used onsite include analyzing equipment and potentially exit signs containing tritium. These materials are handled by the Radiation Safety Officer according to the applicable regulations of:

- The US Nuclear Regulatory Commission, which regulates the use of source, byproduct, and special nuclear material under the authority of the U.S. Atomic Energy Act (10 CFR Parts 1 - 171);
- The USDOT regulations, which establish criteria for the safe transport of radioactive materials in the United States (49 CFR Parts 171 through 178); and
- The EPA, which regulates the disposal of low level radioactive material mixed with hazardous waste (40 CFR Part 261).

[9] Purposely leaving paint containers that contain hazardous waste paints open to dry to render them non-hazardous is not permitted.

## 4.19 Rags

The disposal of rags is dictated by the material on the rag:

- Rags contaminated with petroleum products, are considered *non-hazardous waste once no free liquid can drain from the rag* and are collected, placed into shipping containers and shipped offsite. Collected oil is managed as used oil;
- Rags contaminated with other materials are classified based on the classification of the material used on the rag if the materials were to become a waste:
    - Rags managed as *hazardous waste* are those contaminated with a material that is a hazardous waste if disposed of. These rags are shipped offsite to an appropriate facility;
    - Rags managed as *non-hazardous waste* are those contaminated with a non-hazardous material. Excess liquid is removed from these rags and then the rags placed into shipping containers and shipped offsite. Any collected liquid are managed according to the procedures described in this Plan for the particular liquid.

## 4.20 Scrap Metal

Scrap metal includes building materials, empty drums, welding rod, compressed gas cylinders, grinding ball chips, mill liners, crusher liners, oil filters, punctured aerosol cans, and copper wire. To the extent practical, the project recycles any scrap metal generated at the site. If the material cannot be recycled, it is disposed of underground.

## 4.21 Solvents

Eco-friendly solvents are primarily used at the Greens Creek Mine. These solvents are non-hazardous. Provided they are appropriately managed and not mixed with other wastes or materials, they can be disposed of as *non-hazardous waste*. The main solvents generated are those from the parts washers. The solvent is reused and must be periodically replaced. Solvents from parts washers are sampled and characterized to determine if they are hazardous waste. Sludge from the parts washers is also sampled and characterized. Parts washer solvents and sludge are shipped offsite to an appropriate facility.

Used solvent can in some cases be mixed with used oil [40 CFR §261.3(b)(3)] and burned in space heaters to recover energy.

## 4.22 Tires

Tires are shipped offsite for recycling if feasible. If not recycled, they are disposed of within the designated underground disposal areas.

## 4.23 Tailings Disposal Facility (TDF)

Tailings produced by the flotation process at the Greens Creek mill are dewatered in a filter press. The tailings, consisting of between 66% and 86% by weight passing the No. 200 mesh. Tailings are permanently disposed of in two methods:

1. A portion (up to 50%) of the mill tailings are filter-pressed and mixed with cement (5-8%) and used as structural backfill in the underground working of the mine. In general, tailings backfilling to mined-out areas underground is the preferential disposal method. Tailings backfilling provides structural support of the underground workings and allows removal of more ore.

2. The remainder of the tailings is filter-pressed and strategically placed as dry tailings within the TDF. The tailings are placed into cells, spread and compacted (at just below the optimum standard Proctor moisture content of approximately 12%).

The TDF is situated near Hawk Inlet. Tailings are loaded at the Tailings load-out area into covered “maxhaul” tractor/trailers, each with a 45-ton capacity, and hauled down the B Road from the mill to the TDF. Approximately 20 round-trips per day are required, but this varies depending on the daily underground tailings backfill requirements.

The surface placement method involves depositing the tailings in discrete cells in the TDF, which allows better control over compaction, drainage and pore pressure dissipation. An access road is constructed, and the pile is divided into several cells. Prior to placing the tailings, any saturated tailings or snow accumulations on the placement surface are cleaned off. The tailings are placed in a small area and loads are recorded by cell. The tailings are spread in a sloped lift and compacted by several passes with a bulldozer followed by overlapping passes of a vibratory roller. During this placement, the grading and compaction-sealing of the surface allows surface water to run off, and, as best as possible, minimizes ruts or indentations so that infiltration into the placed tailings is minimized. Due to the limited placement area, lifts are adjusted to maximize cell placement and slope consistency. Placement then progresses to another area.

### 4.23.1 Co-Disposal of Tailings and Waste Rock

The primary purpose of co-disposal is to reduce pyrite oxidation and metal leaching from waste rock by surrounding it with a matrix of fine-grained material (tailings), which will extend the duration over which the rock is able to neutralize acidity. Co-disposal of waste rock with tailings at the TDF has several benefits, including:

- Reduced waste rock oxidation rates and extended acid neutralization capacity;

- Improved tailings geotechnical characteristics, including lower permeability, higher friction angle, dilation during shear testing and good water retention capacity;
- Improved pore water chemistry relative to that of tailings and waste rock disposed of separately;
- Improved drainage quality at sites where waste rock is removed from temporary storage sites; and,
- Consolidation of sites requiring composite soil cover reclamation.

Effective mixing of the codisposed material is achieved by cutting and spreading a row of adjacent piles of tailings and waste rock into a short lift and then reworking the lift with an additional pass with the bulldozer. The lift is then compacted with a vibratory roller.

The tailings pile will receive Class 1 for outer surfaces, Class 2/3 for interim surfaces and roads and Class 4 for tailing co-disposal (special conditions apply). The pile will also receive weathered Class 2/3 waste rock for disposal within the TDF.

## 4.24 Waste Rock

Due to its variable geochemical properties (and acid generating potential), waste rock is managed based on the following classification system. The waste rock classification by an experienced geologist at the underground blast face or muck pile is based on visual characteristics as verified through testing identified in Section 2.4.

Waste Rock Types:

- Class 1: This material has a Net Neutralization Potential (NNP) > 100 tons Calcium carbonate ($CaCO_3$)/1000 tons. No special handling is required.
- Class 2: This material has a NNP value between 100 and -100 tons $CaCO_3$/1000 tons and is placed at Site 23.
- Class 3: This material has a NNP value between -100 and -300 tons $CaCO_3$/1000 tons. It is placed at Site 23.
- Class 4: This material has a NNP value less than -300 tons $CaCO_3$/1000 tons and is kept underground.

Waste rock at Greens Creek has two general conditions; fresh waste rock from the mine and weathered waste rock from older waste sites. Fresh rock is generally alkaline (pH 7-9). Weathered rock from older waste sites is either near neutral (pH 6-8) or acidic (pH <6).

### 4.24.1 Waste Rock Management for Disposal

Waste rock disposal management follows the following criteria:

- Mixing of Class 2 and Class 3 is allowed to avoid physical discontinuities

in the waste rock dump;

- Priority use of Class 1 is of higher beneficial use at Site 23 and the TDF area as an the outer slope encapsulating layer;

- Place Class 1 as a outer layer at Site 23 and the TDF.

### 4.24.2 Site 23 Production Waste Rock Disposal Facility

Waste rock Classes 1 through 3 hauled from the underground mine is placed at Site 23, west of the mill site. Site 23 is the only active production rock disposal facility. The site is being developed with outer slopes acceptable for final closure (3H:1V) using the ascending ("bottom up") construction method. In addition, designated placement zones linked to the three classes of rock are marked on the active lift area prior to placement.

### 4.24.3 Site E Inactive Waste Rock Dump

Weathered waste rock from Site E is being relocated for permanent co-disposal at the TDF. Approximately 365,000 $yd^3$ of waste rock and glacial till were placed at the site from 1988 to 1994. Removal of the waste rock commenced in 2009 and will take several years to complete.

### 4.24.4 Underground

Underground stopes will receive tailings and all forms of waste rock. Class 4 waste rock will remain underground and weathered waste rock is limed prior to backfilling.

Potentially acid generating waste rock will not be backfilled above the 900-foot elevation. It is likely that workings above the 900-foot level will not be completely submerged after mine closure.

## 4.25 Water Treatment Plant (WTP) Wastes

- Analytical waste chemicals and reagents from the WTP are tested and disposed of according to hazard classification.

- Non-hazardous filter press sludge is disposed of in TDF.

## 4.26 Wood, Paper and Cardboard

There are two cardboard compactors; One at the 920 Warehouse and one at the Hawk Inlet Cannery. Most of the cardboard received on the island is compacted and shipped offsite for recycling

Wood and some cardboard products are still burned at the TDF or Site 23. Ashes from open burning are disposed of within the TDF or Site 23.

# 5.0 Spill Prevention and Response

The regulations governing spill response for the project involve the Alaska Department of Environmental Conservation (ADEC) and U.S. Environmental Protection Agency (EPA).

Table 5-1 provides a list of the required oil spill response plans, along with the areas where they apply and the federal or state agency with jurisdiction over the plans. In addition to oil spill response, the Greens Creek Mine response plan includes the use, storage, transport and disposal of other hazardous substances.

**Table 5-1: Oil Spill Response Plans**

| Plan | Application | Jurisdiction | Reference |
|---|---|---|---|
| Marine Transportation Facility Response Plan | Bulk petroleum shipments to Hawk Inlet | USCG | 33 CFR Part 154 |
| State of Alaska Oil Discharge Prevention and Contingency Plan | Hawk Inlet fuel storage/ transfer facility<br>Facility piping<br>Vessels and barges<br>Mine site oil/fuel storage | ADEC | 18 AAC 75 |
| SPCC Facility Response Plan | Containers of oil/fuel ≥ 55 gallons<br>Mill site oil/fuel storage | EPA | 40 CFR Part 112 |

## 5.1 Spill Reporting

Spill notification for the project involves several different agencies depending on the substance and quantity spilled, including the EPA, USCG, National Response Center (NRC) and ADEC, as described below. The following requirements are for oil and hazardous substances other than process solution spills. For spills of process water solution, the procedures outlined in Appendix B are followed.

- The requirements for reporting spills to ADEC are contained in 18 AAC 75, Article 3:
  - *Any release of a hazardous substance* must be reported as soon as the person has knowledge of the discharge;
  - *Any release of oil to water* must be reported as soon as the person has knowledge of the discharge;
  - *Any release of oil to land* in excess of 55 gallons must be reported as soon as the person has knowledge of the discharge;
  - *Any release of oil to land* in excess of 10 gallons but 55 gallons or less must be reported within 48 hours after the person has knowledge of the discharge;
  - A written report of any discharges of *oil from 1 to 10 gallons to land* shall be provided on a monthly basis;

  - *Any release of oil in excess of 55 gallons to secondary containment* must be reported within 48 hours after the person has knowledge of the discharge.

- Spills to water or wetlands or those that may affect wildlife or marine life are required to be reported to the Alaska Department of Fish and Game (ADF&G) and/or FWS.
- Spills occurring on state land must be reported to the Alaska Department of Natural Resources (ADNR).
- According to the EPCRA regulations in 40 CFR § 355.40, certain releases of a hazardous substance require immediate reporting to the community emergency coordinator for the LEPC of any area likely to be affected by the release and the SERC of any State likely to be affected by the release. In the case of the Greens Creek Mine project, there is no LEPC currently active within the project area, in which case, reporting would be made to the Alaska SERC. Reporting is required for releases of a reportable quantity (RQ) of any Extremely Hazardous Substance (EHS) or Comprehensive Environmental Responsibility, CERCLA hazardous substance (See EPA's "List of Lists" for the reportable substances and associated RQs).
- Reporting to the EPA is required for any release (other than a federally permitted release or application of a pesticide) of a hazardous substance in a quantity equal to or exceeding the reportable quantity in a 24-hour period (see EPA's "List of Lists"). Reporting to the EPA can be accomplished by notifying the National Response Center (NRC).
- The EPA also requires reporting of discharges of oil in such quantities that the Administrator has determined may be harmful to the public health or welfare or the environment of the United States, which includes discharges of oil that violate applicable water quality standards, cause a film or sheen upon or discoloration of the surface of the water or adjoining shorelines, or cause a sludge or emulsion to be deposited beneath the surface of the water or upon adjoining shorelines. Reporting to the EPA can be accomplished by notifying the NRC.
- Spills to navigable waters must be reported to the US Coast Guard, which can be also made through reporting to the NRC (run by the USCG).
- Spills from a regulated pipeline are required to be reported to the USDOT.
- Spills to National Forest System lands should be to be reported to USFS.

Additional spill reporting notifications may be required depending on the area of the spill, substance spilled, and agreements made between agencies and/or stakeholders and HGCMC.

# 6.0 References

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# Appendices

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# Appendix A

## Requirements for Hazardous Waste Accumulation Areas

## Requirements for Hazardous Waste Accumulation Areas

| RCRA 40 CFR Reference | Description | SQG | LQG |
|---|---|---|---|
| 262.34(a)(2) | Containers must be clearly marked with the accumulation start in a way that is visible for inspection | Yes | Yes |
| 262.34(a)(3) | Containers must be clearly labeled with the words “Hazardous Waste” | Yes | Yes |
| *265 Subpart C – Preparedness and Prevention* | | | |
| 265.31 | Maintenance and Operation of Facility | Yes | Yes |
| 235.32 | Required Equipment | Yes | Yes |
| 265.33 | Testing and Maintenance of Equipment | Yes | Yes |
| 265.34 | Access to Communications or Alarm System | Yes | Yes |
| 265.35 | Required Aisle Space | Yes | Yes |
| 265.37 | Arrangements with Local Authorities | Yes | Yes |
| *265 Subpart D – Contingency Plan and Emergency Procedures* | | | |
| 265.51 | Purpose and Implementation of Contingency Plan | No | Yes |
| 265.52 | Content of Contingency Plan | No | Yes |
| 265.53 | Copies of Contingency Plan | No | Yes |
| 265.54 | Amendment of Contingency Plan | No | Yes |
| 265.55 | Emergency Coordinator | See 262.34(d)(5) | Yes |
| 265.56 | Emergency Procedures | See 262.34(d)(5) | Yes |
| *265 Subpart I – Use and Management of Containers* | | | |
| 265.171 | Condition of Containers | Yes | Yes |
| 265.172 | Compatibility of Waste With Container | Yes | Yes |
| 265.173 | Management of Containers | Yes | Yes |
| 265.174 | Inspections (at least weekly) | Yes | Yes |
| 265.176 | Special Requirements for Ignitable or Reactive Waste | *No* | Yes |
| 265.177 | Special Requirements for Incompatible Wastes | Yes | Yes |
| 265.178 | Air Emission Standards | *No* | Yes |
| *265 Subpart AA – Air Emission Standards for Process Vents* | | *No* | Yes |
| *265 Subpart BB – Air Emission Standards for Equipment Leaks* | | *No* | Yes |
| *265 Subpart CC – Air Emission Standards for Tanks, Surface Impoundments and Containers* | | *No* | Yes |
| 265.111 | Closure Performance Standard | *No* | Yes |
| 265.114 | Disposal or Decontamination of Equipment, Structures and Soils | *No* | Yes |
| 265.16 | Personnel Training (includes specific requirements, such as annual refresher and maintenance of training records) | See 262.34(d)(5) | Yes |
| 262.34(d)(5)(i) | Emergency Coordinator on premises or on call responsible for coordinating emergency response measures | Yes | See Subpart D |
| 262.34(d)(5)(ii) | Posting of Emergency Information | Yes | See Subpart D |
| 262.34(d)(5)(iii) | Personnel Training | Yes | See 265.16 |
| 262.34(d)(5)(iv) | Emergency Response Procedures | Yes | See Subpart D |

# Appendix B

## Reporting Criteria for Process Solutions

**Greens Creek Mine Process Solution Discharge Response and Notification**

Any spill resulting in process solution escaping from the secondary containment systems is responded to immediately as follows:

1. Notify the Mill Supervisor:
    a. The Mill Supervisor will ensure that immediate shutdown or repair of the system experiencing the upset.
    b. The Mill Supervisor would contact personnel from the environmental and safety department.
2. The Environmental Manager or their designee is responsible for notifying the appropriate agencies. Due to the liabilities associated with hazardous materials incidents, only personnel who are familiar with the facility components and reporting requirements should contact the regulatory agencies.
    a. **Spills at or over the Reportable Quantity (RQ)** (see EPA's "List of Lists") for the substance spilled would require immediate reporting to the Alaska Department of Environmental Conservation, Spill Prevention and Response **(ADEC SPAR) via telephone (907) 268-3063, fax (907) 269-7648, or outside business hours at 1-800-478-9300** and the National Response Center **(NRC) at 1-800-424-8802 or through their online reporting system**;
    b. Spills or releases below the RQ would require documentation that no surface or groundwater was impacted (through the Greens Creek Mine Spill Report Form);
    c. Spills to water or wetlands or those that may affect wildlife or marine life would also be reported to the ADF&G and/or FWS by ADEC;
    d. Spills occurring on state land are to be reported to the Alaska Department of Natural Resources (ADNR);
    e. Releases of a reportable quantity (RQ) of any Extremely Hazardous Substance (EHS) or Comprehensive Environmental Responsibility, CERCLA hazardous substance (See EPA's "List of Lists" for the reportable substances and associated RQs) require reporting to LEPC/SERC.
3. Once a release of process solution has been terminated and any required immediate agency reporting has been made, all pertinent information regarding the spill are recorded in the incident management system.
4. All liquid, in collectable volumes, remaining outside containment are pumped into a lined containment area, pond, or suitable vessel for temporary containment (portable tank).
5. Soil contaminated with other regulated material are decontaminated or disposed of according to Safety Data Sheet instructions for the product.
6. The incident report documenting the spill, response, and cleanup is to be submitted to the incident management system as soon as possible with all required information.